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DRINKING WATER POLITICS IN RURAL MEXICO: NEGOTIATING POWER, JUSTICE, AND SOCIAL SUFFERING

VOLUME I

By

Michael C. Ennis-McMillan

A DISSERTATION

Submitted to
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ABSTRACT

DRINKING WATER POLITICS IN RURAL MEXICO:
NEGOTIATING POWER, JUSTICE, AND SOCIAL SUFFERING

By

Michael C. Ennis-McMillan

This dissertation analyzes political aspects of managing a drinking water system in a rural mestizo community located in the Valley of Mexico. The study draws from political economy perspectives in medical anthropology to analyze how stratified social relations influence the suffering associated with inadequate drinking water supplies. Based on 21 months of fieldwork (1993-1996), the analysis examines how differing groups compete for authority over managing scarce drinking water resources in a semiarid environment. The research methods included participant observation, archival analysis, and interviews with local authorities.

Community residents with ties to agriculture (i.e., campesinos or peasants) draw on an extensive history of communal management of surface water for irrigation, and have applied similar practices for managing groundwater for household consumption. All households have rights to drinking water, provided members abide by customary monetary and nonmonetary obligations (e.g., civil and religious cargo service, festival sponsorship involving mayordomías, and obligatory corvee labor or faenas).

Recent in-migration from urban areas and social stratification have challenged local efforts to provide a just distribution of drinking water. Local authorities deploy their organizational power and resist market-based water management practices that favor wealthier households. The study examines conflicts and negotiations among residents regarding: rights and duties associated with drinking water as a communal resource; centralization of water authority among residents with ties to agriculture (i.e., irrigation users and ejidatarios); women in cargo service; and withdrawing drinking water as a sanction to those who refuse to fulfill customary obligations.

During water shortages, residents said they were "suffering from water," a local idiom that referred to bodily distress that did not correspond to biomedical categories of disease used by public health programs. The study analyzes this distress as a form of social suffering that reflected the inequalities people faced in a socially and ecologically marginal setting. The study examines how differing interests based on socioeconomic stratification, migration, and gender shaped local views of water-related suffering. The dissertation discusses implications of conceptualizes drinking water as a crucial but contested and unequally distributed resource for human health in a changing ecology.

To David

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The limitations, errors, and views presented in this dissertation are my own and not those of the individuals and institutions listed above.

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LIST OF ABBREVIATIONS

CEAS	Comisión Estatal de Agua y Saneamiento (State Water and Sanitation Commission, State of México).
CNA	Comisión Nacional de Agua (National Water Commission). The CNA was formed within the SARH in 1989.
CNC	Confederación Nacional Campesina (National Campesino Confederation).
IDWSSD	International Drinking Water Supply and Sanitation Decade.
INEGI	Instituto Nacional de Estadística, Geográfica e Informática (National Institute of Statistical and Geographical Information).
ISEM	Instituto de Salud del Estado de México (Health Institute of the State of Mexico)
NAFTA	North American Free Trade Agreement (in Spanish, Tratado Libre Comercial, TLC)
PAHO	Pan American Health Organization.
PAN	Partido de Acción Nacional (National Action Party)
PRD	Partido de la Revolución Democrática (Party of the Democratic Revolution)
PRI	Partido Revolucionario Institucional (Institutional Revolutionary Party)
PROCEDE	Programa de Certificación de Derechos Ejidales y Titulación de Solares Urbanos (Program for Certifying Ejido Rights and for Granting Titles to Settled Plots of Land)
PRONASOL	Programa Nacional de Solidaridad(National Solidarity Program)

SAF	Secretaría de Agricultura y Fomento (the Secretary of Agriculture and Development).
SARH	Secretaría de Agricultura y Recursos Hidráulicos (the Secretary of Agriculture and Hydraulic Resources).
SEDUE	Secretaría de Desarrollo Urbano y Ecología (the Secretary of Urban Development and Ecology).
SRH	Secretaría de Recursos Hidráulicos (the Secretary of Hydraulic Resources, replaced in 1977 with SARH).
SSA	Secretaría de Salubridad y Asistencia (the Secretary of Sanitation and Welfare).
TLC	Tratado Libre Comercial(in English, North American Free Trade Agreement, NAFTA)
WHO	World Health Organization.

EXCHANGE RATE

1994	US$1.00 = $3.00 pesos
1995-1996	US$1.00 = $6.00-7.00 pesos

INTRODUCTION

At the main entrance to La Purificación[1], a large metal arch over the main paved road greets passersby with the message "Welcome to the Paradise of La Purificación." Some vehicles in the community have bumper stickers that read "I (love) the paradise of La Purificación," with the word "love" represented by a red heart. Indeed, during my field research in the community, residents routinely commented that, while not an ideal setting, their rural foothill community had many positive qualities that were increasingly difficult to find elsewhere in the densely populated, polluted, and sometimes violent Valley of Mexico. Los Purifiqueños, as many referred to themselves, often pointed to the distant smog hanging on the horizon over Mexico City, and reminded me that compared to urban centers at lower elevations, their community enjoyed cooler and fresher air, abundant foliage, charming customs, and a quiet, tranquil, and relatively crime-free setting where everybody, "like one family" ("como una familia"), lived

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[1] The community is officially called La Purificación Tepetitla, but it is most commonly referred to as simply La Purificación, a usage I adopt in this dissertation.

together and knew each other. Residents often made puns on the community's name by referring to the "pure air" (aire puro) and the process of becoming "purified" (purificado) by visiting and living in the community. Los Purifiqueños also made puns about the community's "purified water" (agua purificada), that is, its drinking water supplies.

Of course, in 1996, traveling further down the main road, one encountered another type of message. In the main plaza, in front of the 17th-century Roman Catholic church, a sign nailed to a tree read: "Warning. Don't be fooled. Not all properties come with drinking water and sewage service. For information, contact the civil authorities." This sign alluded to tensions in the growing community, a community made up of long-time residents and new migrants who did not know each other. The sign indicated that there were problems for people seeking to reside in La Purificación, especially problems related to drinking water.

In this dissertation, I examine drinking water issues in La Purificación, a mestizo community of about 3,500 people living in the eastern foothills of the Valley of Mexico. In particular, I explore the political aspects of installing and managing a piped drinking water system in a Mexican community. I analyze these politics by providing an ethnography of los Purifiqueños and their efforts to deal with conflicts related to managing a drinking water system. The new drinking water system has, on the one hand, provided people a vital resource and moderated the suffering related

to living in a semiarid environment of Mexico. On the other hand, better drinking water supplies have created a new set of social consequences involving power, conflict, and cooperation.

One cannot live in La Purificación long without appreciating the enormous emphasis that residents place on drinking water. In this semiarid and hilly environment, drinking water is a scarce and costly resource, one that people talk about daily, and one that motivates some residents to develop strategies for maintaining community control over water management. Water, it seems, has long been a defining aspect of social life in La Purificación.

Local discourse about living in a paradise does not refer to an unspoiled, remote, and isolated setting being destroyed by the recent influence of modern, urban society. In fact, historical documents show that, until recently, los Purifiqueños have rarely portrayed their community as a paradise and they have long been involved in social relations outside the community. Many long-time residents recall the difficulty in previous decades of living in a poor, campesino[2] community of about 500 people, working on dry and marginal agricultural lands. They have, however, valued a certain measure of autonomy and have worked hard to

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[2] In Chapter 1, I elaborate on the term campesino, which is often translated as peasant. I am using both campesino and peasant in a broad sense to refer to rural dwellers with ties to small-scale agriculture and who are dependent on and integrated into a state.

secure control of limited water resources for irrigation and domestic use.

To improve their lives, los Purifiqueños have often sought outside support to install electricity, build roads, establish schools, and improve their drinking water system. In the 1970s, after the main road had been paved, a local entrepreneur installed the arch to welcome tourists and advertise the beer he distributed. The road project was conceived as a way to establish greater linkages with urban centers in order for residents to sell agricultural products in urban markets and to travel to new wage jobs. These linkages, however, generated unintended consequences, especially the in-migration of people leaving urban areas and looking for a desirable place in the countryside to live.

I take a local focus on drinking water issues to contribute to discussions about the global problem of developing rural drinking water systems, which often fail soon after being implemented. This ethnography of La Purificación's long-running community-managed drinking water system examines political issues that influence success and failure of the system. I focus my ethnographic analysis on the activities and perspectives of local water authorities and on established residents, most of whom live in households with a mixture of wage labor and subsistence agriculture. I also relate community issues to broader historical and regional processes. I analyze local

documents and examine historical dimensions of developing and managing a drinking water system in the context of broader social processes. I examine socioeconomic stratification, migration history, and other forms of difference in the community and how such differences affect water politics. I also pay attention to the ongoing constructions and negotiations of the meanings and practices residents of La Purificación link to drinking water "customs" and "traditions." In addition, this study is one of many ethnographic studies conducted as part of a long-term analysis that anthropologists initiated in the region decades ago. I had access to valuable data sets, such as a regional ethnographic archive and published works of the region, which allowed me to contextualize the community in the region and relate local issues to regional pressures on water.

Although my focus is on data collected at the community level, I also gathered some data concerning the community's relations with regional and national processes. I conducted this research during the Mexican government's implementation of new federal water laws and during a national economic and political crisis. I examine some issues related to agrarian reform, the economic crisis, and competition over water with urban areas.

The seemingly romanticized local discourse about "the paradise of La Purificación" has recently emerged at a time when residents have become ambivalent about their

connections with Mexico City and the densely populated contiguous settlements that are expanding ever closer to the eastern foothills of the Valley of Mexico. Los Purifiqueños are uneasy with current changes and they struggle to imagine and construct a cultural future in a marginal foothill setting that has become relatively pleasant compared to the urbanized valley below. Many of their contemporary struggles center on issues related to drinking water.

Overview of the Dissertation

In Chapter 1, "Drinking Water Politics in Rural Mexico," I outline my use of political economy perspectives in medical anthropology to study political aspects of managing the drinking water system in La Purificación. This approach offers a way to explore the complexity of drinking water management as it relates to culture, suffering, ecology, power, and social change. Above all, I conceptualize drinking water as a contested resources in a changing ecology, and drinking water management as something that is conditioned by socioeconomic stratification and power relations.

In Chapter 2, "Conducting Ethnographic Research in La Purificación," I describe the ethnographic and archival methods that follow from my conceptual framework. I also present many of the choices that I made in collecting and analyzing data about drinking water politics.

In Chapter 3, "Living in Northern Acolhuacan," I describe the region within which La Purificación is located. I also outline regional issues that influence local drinking water management.

In Chapter 4, "Living in La Purificación: A Foothill Community," I describe La Purificación, and I introduce local factors that influence drinking water politics. In particular, I introduce information regarding socioeconomic stratification, migration, and political and religious organization that I draw on in later chapters.

The major findings of the research are presented in the next three chapters, each emphasizing different political aspects of drinking water management. Chapter 5, "Laboring for Water," focuses on the 20th-century history of land, labor, and water in La Purificación. The chapter examines how community residents with ties to agriculture subsumed both irrigation management and drinking water management within the local political and religious organization. With a decline in agriculture and the importance of irrigation, drinking water has emerged in the last decades of this century as a significant issue of struggle within the community.

Chapter 6, "Leveling the Water," examines politics within the community and relates these politics to stratified social relations. I analyze the community's current political organization and the efforts by local authorities to provide a fair distribution of drinking water

for all community residents who fulfill community obligations. The chapter analyzes the community's attempts to use the cargo system to maintain a campesino character to drinking water management. These attempts are beleaguered by pressures to use market-based water distribution principles that favor households that occupy higher socioeconomic positions. The chapter also explores how established residents justify their exercise of power as consistent with community customs and traditions, even while they create new practices they refer to as customs and traditions.

Chapter 7, "Suffering from Water," relates drinking water politics to issues of bodily distress. The chapter examines the local discourse about suffering and how it relates to residents' efforts to confront threats to the local system of water management. Drinking water is a vital resource in daily life, and disruptions in drinking water lead to bodily distress. I examine how some community residents associate their bodily distress with the social origins of water scarcity. I also explore ways that this suffering relates to collective efforts to maintain a traditional form to drinking water management and resist attempts to develop urban-based and market-based systems of water distribution.

In Chapter 8, "Summary and Conclusions," I return to the problem of drinking water in Mexican communities, and I

examine theoretical and applied implications this study has for understanding drinking water politics in rural Mexico.

Chapter 1

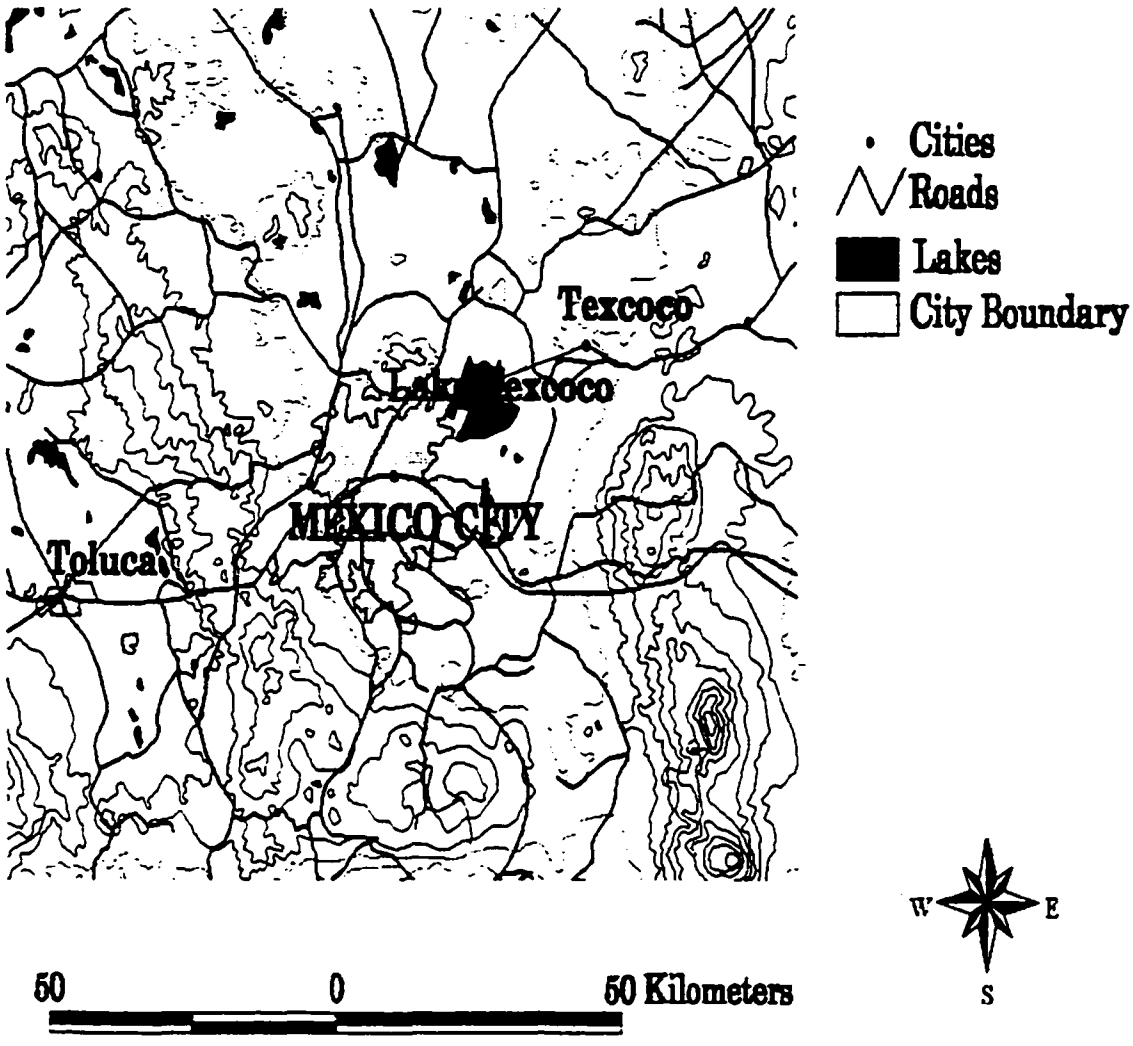
DRINKING WATER POLITICS IN RURAL MEXICO

"¡Es un líquido vital!"
Spoken by a resident at an
emergency community assembly,
La Purificación, Mexico, 1995

This dissertation explores the complex social relations related to drinking water in La Purificación, a rural foothill community located in a northeastern region of the densely settled Valley of Mexico about 30 kilometers from the center of Mexico City (see Figures 1.1 and 1.2). My central concern is the political aspects of installing and managing a piped drinking water system in a Mexican community. I focus on politics in terms of local groups in the community who compete for authority over managing scarce drinking water resources in the semiarid environment of the Valley of Mexico. These political issues have historical roots in long-standing and continuing local struggles over community control of irrigation water. New struggles in La Purificación, however, have emerged and center on providing

Map by Matthew Martinez, Map Library, Michigan State University. Data from ArcView GIS Version 3.0 and Digital Chart of the World, ArcWorld.

Figure 1.1 Map of Mexico and Area of Study.



Map by Matthew Martinez, Map Library, Michigan State University. Data from ArcView GIS Version 3.0 and Digital Chart of the World, ArcWorld.

Figure 1.2 Map of the Valley of Mexico.

a growing community with adequate drinking water supplies. I examine how community residents with differing interests -- primarily related to socioeconomic status, migration, and gender -- address concerns about their water-related suffering.

Below, I elaborate on my analytical approach, which draws from a variety of political economy perspectives in medical anthropology regarding suffering. I also describe drinking water issues in Mexico, and I elaborate on my use of drinking water politics as an analytical concept. In later chapters, I analyze ethnographic and archival data collected during extended field research. My analysis focuses on how community control of drinking water has reinforced a cohesive, and sometimes coercive, social organization that emphasizes a fair and just distribution of water; that obligates people to contribute to community affairs; that is shaped by an interest in ameliorating the suffering associated with water disruptions; and that seeks to counter social influences that hinder local control of the drinking water system. Overall, the dissertation characterizes drinking water as a vital, scarce, and contested resource, the management of which involves issues of power, meaning, and history in rural Mexico.

The Social Origins of Suffering: Political Economy Perspectives in Medical Anthropology

Suffering and its alleviation are central facets of drinking water politics in La Purificación. To analyze water-related suffering, I draw from political economy perspectives in medical anthropology, which, as has been reviewed elsewhere, call for greater attention to the interrelationships of health, illness, politics, and stratified social relations (e.g., Abaya 1994; Baer 1982, 1986; Baer, Singer, and Johnsen 1986; Frankenberg 1988; Lazarus and Pappas 1986; Lindenbaum and Lock 1993; Lock 1993a; Lock and Scheper-Hughes 1996; Morgan 1987, 1989a, 1993; Morsy 1979, 1996; Scheper-Hughes and Lock 1986, 1987; Singer 1986a, 1989a, 1990; Young 1982). I use the term "perspectives" to signal theoretical tensions concerning the use of political economy in medical anthropology research. My dissertation reflects these ongoing tensions by drawing from a variety of perspectives, particularly perspectives related to critical medical anthropology (Baer 1982, 1996; Baer, Singer, and Susser 1997; Singer 1986a, 1989a, 1990), political economic medical anthropology (Morsy 1976, 1989, 1996) and critical-interpretive medical anthropology (Scheper-Hughes and Lock 1987; Lock and Scheper-Hughes 1996). Despite some theoretical differences, these perspectives focus on a number of common issues relevant to my exploration of the social origins of water-related suffering in a Mexican community.

I follow those scholars of a critical medical anthropology perspective who define health as "access to and control over the basic material and nonmaterial resources that sustain and promote life at a high level of satisfaction" (Baer, Singer, and Susser 1997:5). Further, as Morgan notes, political economy perspectives in medical anthropology emphasize "the social and historical roots of disease and health care, with particular attention to the existence of stratified social relations within a world economic system" (1993:2). This line of medical anthropology research calls for further examination of suffering in relation to broader historical, social, and political processes, including: the role of the state, political parties, and class relations in allocating resources; local resistance to public health programs as resistance to domination; and health status in relation to uneven processes of capitalist development. Such issues have been examined in studies of various health problems, such as tobacco-related illnesses, nervous disorders, environmental diseases, and child death (Chavez, Flores, and Lopez-Garza 1992; Ferguson 1981; Millard 1994; Nash and Kirsch 1986; Ong 1988; Scheper-Hughes 1984, 1985; Singer 1986b, 1994; Stebbins 1986a, 1986b, 1987, 1990; Susser 1985; Taussig 1978, 1980; Whiteford 1997, 1998; on related views dealing with political economy of health see also Doyal 1979; Laurell 1989; Laurell et al. 1977; Navarro 1983, 1984; Turshen 1977; Zola 1978). Additionally, political economy

perspectives have guided a series of recent ethnographies that provide in-depth analyses of various health issues, including AIDS, hunger, child death, nervous disorders, aging, traditional healers, reproduction, and primary health care (Comaroff 1985; Crandon-Malamud 1991; Farmer 1992; Howard and Millard 1997; Janzen 1978; Lock 1993b; Menéndez 1981; Morgan 1993; Morsy 1993; Ong 1987; Scheper-Hughes 1992; Taussig 1987; Tsing 1993). I apply these ideas in my study of how access to and control over drinking water is shaped by stratified social relations and power struggles in a particular historical and social context.

Proponents of political economy perspectives in medical anthropology argue that conventional approaches in medical anthropology have tended to overlook political aspects of health issues and instead have tended to focus on local cultural processes and ethnomedical systems (Baer, Singer, and Susser 1997; Lock and Scheper-Hughes 1996; Morsy 1996). As Morsy (1996:23) notes, political economic medical anthropology "is distinguished from conventional medical anthropology not simply by its scope of analysis but more fundamentally by its priority of embedding culture in historically delineated political-economic contexts." Conventional approaches in medical anthropology refer to earlier tendencies in medical anthropology to emphasize, among other things, the differences between so-called traditional ethnomedicine and biomedicine regarding explanatory models of illness and healing practices (for

examples of conventional medical anthropology, see Foster and Anderson 1978; Helman 1984; Kleinman, Eisenberg and Good 1978). Such approaches have been incorporated into international health programs. Indeed, previous international health and development research has largely focused on cultural, technical, and administrative aspects of installing piped drinking water systems in rural communities of developing countries and has tended not to deal with political aspects of the issue.[3] In postrevolutionary Mexico, for example, rural development programs have focused on drilling wells, installing water pipes, and other technical aspects of installing rural drinking water systems (Hewitt de Alcantara 1984). Anthropological studies have examined rural settings in Mexico and elsewhere, and have reported on the cultural reasons people did not adhere to public health recommendations to boil water, wash hands, or isolate the disposal of human waste from drinking water sources (e.g., Aguirre Beltrán 1963, 1986; Nichter 1988; Paul 1977; Wellin 1955; see also McElroy and Townsend 1985:385). The analysis of technical and cultural issues has become a standard part of international drinking water development programs.

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[3] I am emphasizing the tendency of the international health and development literature to overlook political aspects of drinking water management at the community level in Mexico. Literature about other parts of the world (e.g., the western U.S., Middle East) has examined political dimensions of drinking water, particularly regarding international relations (Fradkin 1968; Frey 1993; Kliot 1994).

International health literature draws from such approaches and focuses on the cultural obstacles to developing water projects, referring to "ethnic beliefs" and "religious beliefs" that supposedly conflict with public health knowledge and practices (e.g., Pan American Health Organization [PAHO] 1987; Whyte 1987). Flores (1995) observes that Mexico's Secretary of Health regularly attributes the high incidence of waterborne diseases in poor areas on the populations' "lack of hygiene" and "bad habits." Vargas and Casillas note that medical professionals in Mexico commonly attribute health problems to cultural issues of "ignorant and superstitious people," especially regarding difficult-to-treat problems that they view as primarily "linked to poverty and poor hygiene" (1989:1343). Morgan (1993) points out that similar views are found in international health and development research, including research concerning rural drinking water and sanitation (see also Navarro 1984). Morgan (1993) argues that such views leave aside political factors and regularly imply that so-called "traditional culture," "ignorance," and "passivity" are major barriers to the acceptance of supposedly technically sophisticated "modern" drinking water systems.

Political economy perspectives, by contrast, highlight socioeconomic stratification and power relations as important factors in the unequal distribution of drinking water and water-related suffering. Political economy of

health studies point out that the unequal distribution of drinking water and sanitation extends along class lines and is a product of global capitalist development (see Doyal 1979). Other scholars are calling for more attention to political issues that influence access to and control over natural resources, including access to drinking water in Latin America (Bell and Franceys 1995; Bennett 1995a, 1995b; Cox and Annis 1988; Lane and Rubinstein 1996; Morgan 1993; Stephen 1992; Whiteford 1997, 1998). This scholarship suggests the need to examine whether powerful groups divert rural drinking water sources to wealthier urban neighborhoods and to large-scale commercial agriculture for irrigation. Thus, a dichotomous emphasis on "traditional" cultural obstacles and "modern" technical solutions overlooks the fact that locally-managed drinking water systems in rural Latin America risk failure when communities cannot contend with power struggles involving groups with competing interests in water resources. Accordingly, water and sanitation projects may fail, not because tradition hinders people from adhering to biomedical standards of hygiene or properly managing a piped water system, but because of social factors that make drinking water unavailable to poor and less powerful social groups (e.g., the working class and peasants).

Morgan (1987, 1993), however, cautions against the tendency in political economy of health studies to explain the poor quality and unequal distribution of health

resources (such as water and sanitation) on the imposition of external capitalist relations. Morgan's (1989b, 1993) study of community participation in Costa Rica shows how the provision of health services, including drinking water, is shaped by a dialectical interaction of local initiatives with regional, national, and international forces. A comparative analysis of primary health care in Mexico and Central America indicates that access to and control over basic resources (including drinking water) is mediated by such factors as the state, interest groups, political parties, and local elites (see Donahue 1986; Green 1989; Morgan 1989a, 1989b, 1993; Stebbins 1986a, 1986b). Morgan's (1993) approach suggests that the provision of water and sanitation services often involves local political and historical dimensions of health problems, and may be shaped by local initiatives to counter social inequality in contexts of unequal capitalist development (Morgan 1993). This fits with a more general approach in anthropological political economy, which has emphasized the creation of cultural differences in the context of uneven global capitalist processes (Mintz 1985; Roseberry 1988, 1989; Smith 1984; Wolf 1982). As Roseberry (1988:163) argues, an anthropological political economy focuses on "the formation of anthropological subjects . . . at the intersection of local interactions and relationships and the larger processes of state and empire making" (1988:163, emphasis in original). Following this approach, I explore the unequal

social distribution of water-related suffering and how access to drinking water is conditioned by power struggles among local groups in the context of broader social forces.

Scholars advocating a critical-interpretive perspective argue that political economy perspectives ought to relate bodily experience to social and political conditions (Lock and Scheper-Hughes 1996; Scheper-Hughes and Lock 1986, 1987, 1990; Taussig 1980; Young 1980). Critical-interpretive approaches are useful for revealing that drinking water is more than simply an unequally distributed health service. Drinking water is intrinsic to daily life and is connected to bodily experience and practice through activities such as drinking, cooking, eating, cleaning, and bathing. Disruptions in access to adequate amounts of drinking water may bring about bodily distress. Comaroff (1982) examines how forms of bodily disruption in many cultures motivate people to examine and alleviate disruptions in the social order. Medical anthropology studies in Mexico and elsewhere in Latin America show how, in many groups, people relate individual bodily distress to social tensions (Aguirre Beltrán 1963, 1986; Foster 1987; López Austin 1988; Ortiz de Montellano 1990; on this process, see Lindenbaum and Lock 1993; Lock and Scheper-Hughes 1996). Other scholars have examined how various forms of bodily disruptions -- nervousness, hunger, spirit possession -- signal problems in the social order, especially as local groups contend with increasing social stratification in relation to the

development of capitalist relations (Lock 1993a; Ong 1987, 1988; Scheper-Hughes 1992; Taussig 1987).

Medical anthropologists have recently been using the concept of social suffering to analyze how people experience and articulate bodily distress in relation to unequal social relations (Green 1998; Kleinman and Kleinman 1996; Kleinman, Das, and Lock 1996). I analyze forms of bodily distress (e.g., physical pain, frustration, anger) associated with inadequate drinking water that lead people to reflect on and take action about the social origins of their suffering. Such suffering does not correspond to biomedical or traditional illness categories, but it is a form of bodily distress that people articulate and attempt to alleviate by confronting social inequality. In this sense, drinking water politics includes debate and negotiation about the suffering brought on by disruptions in water for daily consumption.

Drinking Water Issues in Mexico

Drinking water is a vital part of daily human survival. In numerous ways, unsafe and inadequate water supplies compromise health and generate suffering. In rural areas of developing countries, waterborne diseases account for a significant amount of morbidity and mortality, especially infant and child mortality (Lane and Rubinstein 1996; World Health Organization [WHO] 1981). In Mexico, studies have documented the immense health problems associated with water

quality, particularly for poor populations (Cifuentes, Blumenthal, and Ruiz-Palacios 1995; Juan, Pérez Duarte, and Aguilar Romo 1995; Lemus R. 1995)

To address the suffering associated with diarrheal diseases, cholera, and polluted water supplies, many international health and development programs have focused on installing water and sanitation systems and promoting specific measures (e.g., washing hands and boiling water) to lower health risks (e.g., PAHO 1987; Whyte 1987). This issue has received heightened attention as a global problem, especially after the 1978 Alma Ata Declaration of the "Health for All by 2000" campaign, the subsequent 1980-1990 International Drinking Water Supply and Sanitation Decade (IDWSSD), and other initiatives by WHO, PAHO, and the World Bank (Le Moigne et al. 1994; Whyte 1987; WHO 1981). In Mexico and other Latin American countries, the resurgence of cholera has also reminded people of the need to develop safer water systems in rural areas (Lee 1995b).

However, for many rural people in Mexico and other developing countries, the issues go beyond water quality, the adoption of hygienic practices, and biomedical concerns about diarrheal disease. Many people struggle simply to gain access to enough water for daily needs regardless of the water's potability. Recent discussions have drawn attention to the fact that over 1 billion of the world's people, many of them poor rural dwellers, lack sufficient drinking water supplies (e.g., Bell and Franceys 1995; Lee

1995a, 1995b). Recent reports have cited the gloomy statistics about the unequal access to clean water in the world (e.g., Doyle 1997; Johnson 1998). These reports note that over half of the world's fresh water supplies are located in a few nations, and that higher-income, urban dwellers consume the majority of the world's fresh water supplies (Donahue and Johnston 1998). These problems have led to international attention to the need to develop adequate supplies of drinking water for poor rural populations (Le Moigne et al. 1994; WHO 1981).

Numerous attempts to install rural drinking water systems in developing countries have met with limited long-term success. Elmendorf (1981) notes that up to 50% of rural drinking water and sanitation systems become inoperable within five years. In Latin America, over half the rural population (millions of people) lacks access to drinking water systems and basic health services (Lee 1995a; Mesa-Lago 1992; PAHO 1987). This is a serious matter in rural areas of Mexico. Although 27% of Mexico's population reports inadequate access to drinking water, 10% of the urban population and 45% of the rural population report having inadequate access (PAHO 1987; Restrepo 1995). Elmendorf (1981) notes that this situation can burden poor, rural people, particularly women, who often spend considerable time and money ensuring their households have adequate water supplies for domestic use. In turn, limited water means people cannot follow preventative hygiene

measures, a situation that puts people at risk for health problems (e.g., cholera, skin and eye infections) (Juan, Pérez Duarte, and Aguilar Romo 1995).

These issues are relevant in Mexico, where, as Bennett 1995a) notes, drinking water development, at least on paper, has long been part of national development programs. Mexico's 1917 Constitution lists water as a federal guarantee for all citizens (Leyes y códigos de México 1994a). Public health programs, however, tend to focus on individual health issues and aim to improve water quality (often defined in biochemical terms) by calling for more installation of presumably "modern" piped drinking water systems in rural communities. In my view, such programs may overlook local practices, resources, and institutions already in place that could support alternative community-managed drinking water systems. Effective rural drinking water systems in Latin America depend on local control and community participation to set and collect water fees, resolve local disputes, and coordinate labor requirements for repair, maintenance, and operation (Cox and Annis 1988). This involves capturing "social energy" for organizing community-based development projects (Hirschman 1988). Rather than being an obstacle to development, traditions, in the form of locally meaningful practices, allow people to mobilize local resources and deal with social conflicts that threaten the sustainability of community-managed drinking water systems. In this sense, at a community level, the

installation of a drinking water system has a number of social consequences that involve issues of conflict and cooperation among groups with differential interests and power. I draw on these insights for my approach to studying the struggles among different groups that compete for authority over drinking water in La Purificación.

In the Valley of Mexico, programs have tended to restrict the development of piped drinking water systems in poor rural and urban communities in favor of providing water to wealthier urban neighborhoods, the industrial sector, and irrigation projects (Bennett 1995a, 1995b; Flores 1995; García Lascuráin 1995). In other words, state-sponsored programs tend to address the issue of improving drinking water quality by promoting urban models and market-based distribution mechanisms, which tend to harm people in lower socioeconomic strata of Mexican society.

In this dissertation, I examine ways that, in addition to issues of water quality, the problems of drinking water development also relate to conflicts among groups that have competing views of dealing with water access, quantity, distribution, and management. I examine instances when certain groups of residents in La Purificación, particularly residents of lower socioeconomic strata, relate local health concerns to water scarcity and inequitable distribution of drinking water. I also examine social inequality that leads to disruptions in water quality, quantity, and distribution and generates forms of collective suffering that mediate

collective reflection and action directed at the social origins of that suffering. In part, the threat of suffering reinforces local interest among certain segments of the community to draw on noncapitalist practices and principles referred to as "traditions" and "customs" to manage water issues.

Conceptualizing Drinking Water Politics

In this section, I elaborate my conceptual approach for analyzing drinking water politics in a Mexican community. I focus on local political issues regarding the ongoing process of designing, constructing, managing, and maintaining a piped drinking water system. Below, I outline ways that I draw from anthropological approaches to the study of politics, a broad and multifaceted concept, one that relates to power, social differentiation, and negotiations of meanings and practices (e.g., Abu-Lughod 1993; Comaroff and Comaroff 1992; de la Peña 1981; Dirks, Eley, and Ortner 1994; Escobar 1992; Medina 1997; Morgan 1993; Ong 1987; Ortner 1989; Rosaldo 1993; Roseberry 1989; Scott 1985; Tsing 1993; Wolf 1982, 1990). In this study, I use the concept of politics to refer to the conflicts and negotiations among different groups that have competing interests regarding authority over the piped drinking water system. Primarily, I examine local groups in the community whose interests converge and diverge in relation to socioeconomic status, migration history, and gender. The

following sections synthesize my use of four analytical concepts: culture, ecology, power, and social change.

Culture: Beyond the "Tradition"/"Modern" Dichotomy

My intention is to avoid the familiar opposition of "tradition" and "modern" that one encounters in the international health literature about drinking water. This opposition implies that local culture, in terms of drinking water, lags behind modernity in time and space. In many discussions, the installation of piped drinking water supplies -- like the introduction of formal education, biomedicine, and wage labor -- marks "development," "progress," and "advancement" and signals the shift away from tradition and toward supposedly healthier and sanitary living conditions. This prevalent view portrays the outside introduction of running water as neutral, value free, and something that everyone ought to readily accept. It also fits with popular conceptions in the U.S., whereby people often associate Mexico with diarrhea and other waterborne diseases. Phrases such as "don't drink the water" and "Montezuma's revenge" conjure images of a Mexico that is unhealthy and unsafe for tourists and other visitors, a culture and people supposedly distinct and separate from that of most people living in the U.S.

To challenge such notions, this study uses a dynamic view of culture to explore ways that drinking water politics in rural Mexico involves labor, struggle, and suffering as

well as imagination and creativity. Anthropologists and other social theorists have intensified their criticism of structurally-oriented theories that view culture as a static, homogenous, and coherent system of rules that a group of people shares and follows (e.g., Clifford 1988; Comaroff and Comaroff 1992; Dirks, Eley, and Ortner 1994; Geertz 1973; Giddens 1986, 1987; Marcus and Fischer 1986; Ong 1987; Ortner 1984, 1989; Rosaldo 1993; Tsing 1993). Theorists discuss two interrelated issues when they "write against" such static views of culture (Abu-Lughod 1991, 1993). First, static views of culture tend to separate culture from social processes and overlook the agency and power people have in relation to social structures. Second, such perspectives are most often applied to so-called "traditional cultures," which supposedly belong to a traditional past that is unchanging, distinct, and less valued than modern Western culture. By associating the lack of running water with traditional cultures, studies risk focusing on "signs of the primitive" (Comaroff and Comaroff 1992) that obscure the connections between local life and broader social processes. Consequently, I argue against characterizing the installation of a piped drinking water system as a "sign of the modern," and suggest that drinking water development involves the local creation of new meanings, practices, and institutions not found in conventional drinking water systems.

I consider culture as incomplete and emergent sets of meanings and practices that people create and contest in relation to broader fields of meaning and power. I follow Comaroff and Comaroff (1992:27) who take culture to be "the semantic space, the field of signs and practices, in which human beings construct and represent themselves and others, and hence their societies and histories." These meaningful signs and practices shape, as they are shaped by, the broader social fields within which they are used. As Roseberry notes, "culture is political," since it is influenced by people's differential relations to "material social processes," which in turn shape their interests and intentions in reproducing previous practices as well as imagining and creating new practices (see also de la Peña 1981; Warman 1980; Wolf 1986, 1990). This view gives culture an open-ended, fluid, contested, and partial quality, one that may be influenced by intentional as well as random change. Also, Comaroff and Comaroff (1992:18) note "that 'culture' is often a matter of argument, a confrontation of signs and practices along the fault lines of power." Comaroff and Comaroff argue for more attention to how people make their collective world and make sense of their individual and collective lives, and what broader systems of signs and relations, power and meaning sustain or constrain their activities.

Following this perspective, I examine ways that drinking water management may imply different practices to

different individuals and groups within the same community. Such practices are shaped by competing interests based on an individual's or group's socioeconomic position, access to power, pattern of water use, and claims to water resources. Managing a drinking water system is an ongoing process, which cannot be captured by referring to it as "modern" and opposing it to "tradition." Rather, the installation of a running water system has social consequences that lead people to debate the meaning of traditional and customary practices, and allow some groups to mobilize power and impose particular views regarding, for example, customary corvee labor obligations and water fees. In this study, I examine local debates about the rights and obligations related to drinking water.

In my view, the installation and maintenance of a drinking water system itself is a cultural and political process, one that people conceptualize in relation to their own interests, and one that involves adopting some "modern" practices (e.g., engineering principles and public health standards) while opposing others (e.g., market-based programs and government interventions). By viewing culture as negotiated sets of meanings and practices, I examine how people conceptualize (and reconceptualize) social change in their own terms, and challenge the notion that development entails a unidirectional movement from traditional culture to modernity. Rather than viewing people mechanically following traditions as a set of rules, I focus on people's

political intentions, and their purposive actions related to managing a drinking water system.

I view drinking water management as an unfolding historical process, something never wholly complete, and subject to local interpretation, negotiation, and reinterpretation. Here, I draw on ethnographic perspectives of the relationship of culture and history in Mexico and elsewhere (de la Peña 1981; Roseberry 1989; Stephen 1991; Warman 1980). This means examining the history of social processes that have shaped the installation and management of a drinking water system. In this sense, I agree with Comaroff and Comaroff (1992) when they observe that history is a series of events as well as the significance people attach to those events. This requires an examination of local historical imagination and how people reinscribe the past with meaning. Above, in the introduction, I provide a glimpse of people reinscribing their community's history of harsh living conditions with notions of living in a paradise. Below, in other chapters, I show how people impose traditional and customary water practices on others, even if they created such practices relatively recently. People make sense of their lives and create new cultural forms in the context of what they see as tradition. This allows culture to be emergent and historically situated, always open to change, invention, and creativity even as some parts of the cultural form appear to persist. This

approach pays attention to the social consequences of constructing a drinking water system.

Political Ecology: Contested Access to Water

I also use perspectives from political ecology to conceptualize drinking water as a contested resource in a changing environment. Ecological approaches in medical anthropology focus on health issues by engaging in cross-cultural study of the interaction of human populations and their environment (McElroy and Townsend 1985). Proponents of critical perspectives in medical anthropology, however, note that medical ecology studies have tended to treat environmental health problems as part of a fixed natural environment and have not explored how power struggles among competing groups mediate such problems (Abaya 1994; Baer 1996; Singer 1989b). To address this issue, medical anthropologists have been turning to political ecology perspectives to analyze power relations in relation to the health implications of environmental change (Armelagos et al. 1992; Baer 1996; Leatherman, Goodman, and Thomas 1993; Goodman and Leatherman 1996; Singer 1989b; Whiteford 1997)

Political ecology is a broad and emerging field of study that analyzes the interaction of environmental and political forces affecting differential access to resources such as forests, land, and water (Blaikie 1994; Bryant 1992; Greenberg and Park 1994; Johnston 1997; Peet and Watts 1993; Rocheleau, Thomas-Slayter, and Wangari 1996; Wolf 1972).

Bryant (1992:21) calls for further political ecology research concerning the conflicts over resource access and "the relationship between access rights, local struggle and ecological transformation." Political ecology research, however, has tended not to deal explicitly with health issues and drinking water systems.

I apply this political ecology approach by analyzing conflicts over access to drinking water. I focus on how authorities of La Purificación's drinking water system contend with people who have competing interests, primarily related to economic differences. In fact, I suggest that conflicts over water access and use have long been significant aspects of managing La Purificación's drinking water system.

Additionally, I analyze water use as part of a dynamic and changing ecology. Water is not simply a fixed natural resource waiting for a community to develop and manage it according to public health and engineering principles. Installing a piped drinking water system is itself an ecological change and may influence, and be influenced by, changes in land and water use. For instance, building a piped drinking water system may result in easier access to water for commercial agricultural production, and it may induce migration of wealthier urban dwellers to rural areas and increase population pressures on water resources.

Following political ecology research, I examine a set of interrelated issues: struggles over rights and

obligations regarding water distribution; local social institutions that regulate water access, control, and use; state-supported policies that influence drinking water development; and local social divisions (primarily based on economics, migration, and gender) that mediate conflicts over water distribution. My analysis of local power relations examines the particular opportunities and constraints of community residents as they contend with various competing forces.

Power: Water Politics in Mexico

I also examine ways that water management practices are shaped by power relations. For this study, I draw on Wolf's (1990) concepts of local-level organizational power and structural power (for other applications of Wolf's concepts, see Lamphere 1992; Morsy 1993; see also Adams 1970, 1975). Organizational power (or tactical power) derives from a group's local social relations, such as kin-based and religious groups, and refers to the local organizations that "circumscribe the actions of others within determinate settings" (Wolf 1990:586). In my study, I examine the deployment of organizational power in relation to local drinking water management and the cargo system. Wolf's notion of structural power derives from a group's position within a larger political economy, and it "organizes and orchestrates the settings themselves" within which organizational power also operates (1990:586). By

extension, people of upper socioeconomic strata might be expected to deploy structural power to control water resources, and state water policies may also reflect and express interests of upper socioeconomic strata in society. Wolf calls for greater study of the ways that organizational power and structural power are historically constituted and intersect with each other. In some settings, organizational power may mediate the effects of structural power. This conceptual approach to power is useful for examining how local organizational initiatives regarding drinking water management mediate the effects of structural power.

Anthropologists have also been interested in how structural power and organizational power may be used in what Ong (1987:142) refers to as repressive and productive ways. A repressive use of power refers to the ability of an individual or group to make and enforce certain decisions. Control of drinking water can be used in a repressive manner because individuals or groups gain authority by withholding drinking water from individuals who do not abide by certain decisions. Productive use of power refers to the force of certain meanings and practices (see Ong 1987:142 and her use of Foucault 1979; also see Dirks, Eley, and Ortner 1994; Escobar 1992; Lock and Scheper-Hughes 1996; Ortner 1984, 1989). This relates to cultural forms that people may take for granted as natural parts of their everyday reality, which may mediate structural differences. Comaroff and Comaroff (1992:28) analyze struggles over meanings of water

and sanitation in colonial Southern Africa, and suggest that people may internalize dominant meanings in the form of constraints, conventions, and values related, among other things, to water and sanitation. By extension, I examine how local authorities resist the influence of structural power and exercise a repressive use of organizational power in drinking water management. The same authorities, however, adopt certain views of drinking water -- by treating it as a commodity or something to be managed according to public health principles -- which strengthen outside control of local water resources.

In contrast to most studies of drinking water, a large body of research examines political aspects related to forming community-based organizations that manage irrigation water. Such studies owe intellectual debt to Wittfogel's (1957) study of political centralization and water control. Scholars continue to debate the merit of the "Wittfogel hypothesis," which implies that control of water resources in arid and semiarid ecologies has been an important factor in the emergence of a so-called "oriental despotism" or powerful, centralized states. Palerm Viqueira (1995) acknowledges the limitations of Wittfogel's hypothesis for studying state formation, but she suggests that, in the case of Mexico, the hypothesis calls attention to local political processes of water control and the idea that the operation of a community water system reinforces a cohesive social organization. Similarly, other researchers have called for

more attention to the interrelationship of water control and collective organization and action. For example, Enge and Whiteford (1989:13) examine "collective, locally based organizations" that manage irrigation systems in Mexico. Guillet studies "communal water management" of irrigation in Peru. Hunt (1992:xiii) suggests that Guillet's study of communal water management is also an example of "common property management," and notes that "an understanding of common property in water management is very new, and only now evolving." Hunt (1992:xiii) defines common property as ". . . a resource which is owned and operated, in common by a group. These are corporate groups of internal jurality; the property is clearly known and understood, and utilization rates of the resource are set by the corporate group." For the purposes of this dissertation, I focus on a community-managed drinking water system. However, when analyzing issues related to local use rights and labor obligations, I use the terms "community" and "community-based" interchangeable with related terms (i.e., communal resource management and collective resource management) used in the literature cited above regarding water resource management (on reviews of ethnographic perspectives of water as a communal or common-property resource, see Guillet and Mitchell 1994; Hunt 1988, 1989; Hunt and Hunt 1976; Mabry 1996; Ostrom 1990; on use of religious cargos in regulating rights and obligations to communal water resources, see Melville 1973). I am focusing on how residents

(particularly local authorities) in La Purificación characterize drinking water, in broad terms, as a communal or common resource because, in their view, it is collectively shared and managed by all community members who abide by the local set of customary use rights and obligations.

In general, irrigation studies of Mexico have focused on power struggles over water in arid and semiarid regions. Researchers indicate that water management involves competition among social groups for access to water and that certain segments of society use their control of irrigation systems as a source of repressive power (de la Peña 1981; Enge and Whiteford 1989; Palerm 1967, 1973, 1990; Palerm and Wolf 1972; Palerm Viqueira 1995; Viqueira Landa 1994; Warman 1980; Wittfogel 1990). These conclusions complement those of studies of hydraulic power in other countries, particularly in other arid and semiarid environments (e.g., Gelles 1994; Guillet 1992; Guillet and Mitchell 1994; Hunt 1988, 1989; Hunt and Hunt 1976; Johnston and Donahue 1998; Lansing 1991; Maass and Anderson 1978; Mabry 1996). Whiteford and Bernal (1996) note that, although the Mexican state controls many irrigation systems, many groups of irrigation users have mobilized organizational power to maintain their hold on water and develop autonomous irrigation systems. For centuries, commercial and subsistence agriculturalists in the Tehuacan Valley have formed "collective, locally based organizations" to manage

irrigation water (Enge and Whiteford 1989). Similarly, in the Northern Acolhuacan region where I conducted my research, scholars have documented that rural communities for centuries have formed collective organizations to manage irrigation water for small-scale subsistence and commercial agriculture (Palerm and Wolf 1972; Palerm Viqueira 1995; Viqueira Landa 1994; Wolf and Palerm 1955).

Research about the political aspects of drinking water exists, but it is not as systematic and broad as irrigation studies (Bennett 1995a, 1995b; Cox and Annis 1988; Melville 1996b; Morgan 1993; Whiteford 1997). Insights from studies of irrigation politics, however, suggest that a similar politics is involved in developing community-managed drinking water systems. For example, ethnographic studies of the Northern Acolhuacan region suggest that communities manage drinking water in a centralized and cohesive fashion that is similar to irrigation management (Aldana Martínez 1994; Gómez Sahagún 1992; González Rodrigo 1993; Palerm Viqueira 1993; Rodríguez Rojo 1995). Local authorities mobilize corvee labor for drinking water projects, withhold drinking water to impose sanctions on people, and use the coordinated efforts of civil and religious authorities to manage drinking water. These local practices and institutions are examples of organizational power that emerge from a history of irrigation management and appear to be ways for less powerful people to counter threats to a relatively fair distribution of drinking water.

Drinking water politics in Northern Acolhuacan appears also to be directed at countering powerful interests that seek to transfer the water to wealthier neighborhoods in urban centers, especially Mexico City, which has limited hydraulic resources for its more than 16 million residents (Lane Rodríguez 1994; Palerm Viqueira 1995). Faced with scarce drinking water supplies for most of this century, Mexico City has one of the world's most elaborate and costly hydraulic infrastructures to carry water into the city from distant sources, including from mountain springs inside the valley and from other sources hundreds of miles outside the valley (Bribiesca Casterjón 1960; Cirelli 1996; Flores 1995; Melville 1996b).

Restrepo (1995) portrays the situation of the metropolitan area of Mexico City as an ecological "crisis," due to the dramatic environmental changes including water shortages, water pollution, water rationing, and the ground sinking and caving in as the water table has fallen. Restrepo (1995), however, also argues that water scarcity is a human rights issue because the problems disproportionately affect urban and rural populations made up of people of lower socioeconomic strata who have little ability to mobilize either organizational or structural power. WHO recommends that individuals have from 25 to 50 liters/person/day of clean water (cited in Flores 1995; García Lascuráin 1995). Research reports, however, that, in the metropolitan area of Mexico City, households in upper

socioeconomic strata receive up to 650 liters/person/day but households in the lower strata regularly receive 20 to 40 liters/person/day (Flores 1995; García Lascuráin 1995). Further, Flores (1985) notes that the municipal governments often subsidize water for wealthier neighborhoods, especially those that receive piped municipal supplies rather than water from trucks (pipas) (as is more likely the case in poor neighborhoods). In 1991, government subsidies meant that people living in wealthier neighborhoods in the metropolitan area of Mexico City paid about $40 pesos for 1,000 liters of water piped directly to their house even though it cost the water authority about $240 pesos for each 1,000 liter of water delivered (Flores 1995). At the same time, people living in poor urban settlements on the outskirts of the metropolitan area of Mexico City were paying $500 to $1,100 pesos to fill a metal drum with 200 liters of water that had to last several days (García Lascuráin 1995). García Lascuráin (1995) also documents the high cost of building large water reservoirs (cisterns and piletas), which makes it difficult for most families to store adequate water supplies. Flores (1995:403) concludes that "those who have less economic resources and who consume less water pay for a liter of water at the highest price" in the Valley of Mexico. Similarly, García Lascuráin (1995:161) observes that "lack of hygiene, thirst, health problems, and constant nervous tension are the principal

consequences of the lack of water" for families living in poor urban settings of the Valley of Mexico.

Various mountain communities in the Valley of Mexico have agreed to exchange their mountain spring water for Mexico City's treated sewage water and use this for irrigation and, perhaps, limited domestic use (e.g., Flores 1995; Peña 1996), which has a whole set of health consequences (Cifuentes, Blumenthal, Ruiz-Palacios 1995; Lemus R. 1995). To date, communities in the Northern Acolhuacan region have strongly rejected exchanging surface water or underground water for sewage water from Mexico City (Lane Rodriguez 1994). In large part, this resistance is motivated by concerns about water pollution and scarcity, as well as interests in maintaining local control of all local water resources.

My examination of drinking water politics is timely given the Mexican government's current efforts to overhaul its national water laws and promote the privatization of water management (Leyes y códigos de México 1994b; Melville 1996a; Melville and Peña 1996; Whiteford and Bernal 1996). This represents a shift in structural power away from the state to private entities (Glade 1990; Otero 1996), and suggests the possibility of increasing autonomy from state control. However, as I discuss in later chapters, new state policies may signal a threat to community-based drinking water systems in favor of urban control. In the area of drinking water management, the state may actually be

transferring power away from communities and centralizing it at a higher level of state authority (i.e., the municipio) and influencing which noncommunity entities may privately manage its use according to market-based principles.

Social Change: Consumption Politics in Latin America

I also examine consumption issues related to drinking water politics in rural Mexico. This idea relates to recent research that reconsiders the interrelationship of social change and political action in Latin America (Bennett 1995a, 1995b; Escobar 1992; Escobar and Alvarez 1992; Jelín 1990; Levine 1993). Specifically, scholars criticize the use of long-held assumptions that Latin American politics centers on relations of capitalist production, and that social change comes about by elections and large-scale actions of wage laborers and unions confronting the structural power of capitalists. Scholars have paid greater attention to the variety of new social movements, protests, and community mobilizations concerning consumption issues and the access to resources such as drinking water, food, and housing in Latin America (Escobar and Alvarez 1992; Jelín 1990; Stephen 1990, 1991; Stephen and Dow 1990). This scholarship suggests the need to explore how social change relates to power struggles around issues of household consumption and not simply struggles involving relations of production (i.e., struggles between capitalists and wage laborers).

A recent body of work has included drinking water as one of a number of resources related to protest and mobilization in Latin America, mostly in urban settings (Bennett 1995a, 1995b; Morgan 1993; Stephen 1992). Most notably, Bennett (1995a, 1995b) has indicated that in Monterrey, Mexico's third largest city, powerful groups took control of water resources and transferred drinking water to the industrial sector. This has resulted in shortages of water for domestic use, prompting people, particularly lower-class women, to protest the unequal power relations that limit access to water for household consumption. Other studies have suggested that protests and struggles concerning drinking water may be influenced by differing class, ethnic, and gender interests, especially during periods of economic crisis (Morgan 1993; Stephen 1992). Water politics is one way that Mexicans and other Latin American peoples have taken an important consumption issue, necessary for daily survival, and rallied around the issue to protest broader conditions of social inequality and environmental injustice. In this sense, research suggests that class-based structural inequality may be moderated by gender and ethnic differentiation.

This topic also relates to discussions about Mexican development and the influence of the powerful postrevolutionary state. Coburn and Wortzel (1986) argue that, until recently, Mexico was one of Latin America's most centralized states, with a low visibility of private

enterprises and privately administered resources. Mexico also had one of the most centralized forms of federal water resource management (Lee 1990). This has changed since the 1980s debt crisis and the 1990s liberalization and reform measures, including privatization programs involving rural development and water resource management (Foley 1995; Melville 1996a; Otero 1996; Whiteford and Bernal 1996). Since the 1980s, the Mexican state has been less able to provide basic health services and has been promoting ways to privatize state health-related services, which has led to new forms of mobilization around consumption issues (Laurell 1991; see also Escobar Latapí and González de la Rocha 1991). A new economic and political crisis began after the 1994 departure of the Salinas administration, which coincided with the start of my field research and influenced local mobilization around drinking water issues.

The studies cited above concerning collective mobilization and drinking water have concentrated on urban areas, where I suspect water protests are more visible than in rural areas. While less visible, I suspect rural mobilization concerning drinking water issues does occur and is related to the political process of constructing and representing the notion of community. Here, I draw on Wolf's (1957, 1959, 1966, 1986) concept of the "closed corporate peasant community." The term "peasant" is related to a large body of literature, much of it controversial, on social stratification and political action in Mexico (e.g.,

de la Peña 1981; Palerm 1989; Palerm and Wolf 1972; Palerm Viqueira 1993; Roseberry 1988, 1989; Stephen 1991; Warman 1980; Wolf 1959, 1966). For my study, I use the term "peasant" and "campesino" interchangeably, and I follow the recent "working definition" by Stephen and Dow of the term "peasant" used in recent studies of class, politics, and religion in Mexico:

> Here a peasant loosely refers to an agrarian-based individual who, while unavoidably participating in wider social, economic, and political relationships, is simultaneously active in local political, economic, and religious institutions. These institutions maintain an internal dynamic that is responsive to, yet not solely determined by, the state, national, and international economies. Economically we cannot define a peasant as an individual who participates solely in agriculture, either for subsistence or commercial purposes. In reality, most peasant individuals and households engage in multi-stranded strategies of employment, mixing wage labor, subsistence agriculture, craft production, migration, and other work forms in order to make a living [1990:5].

I use this definition to characterize how people who identify themselves as "campesinos" make a living and how this relates to their efforts to manage the local drinking water system. In part, their efforts are related to the marginal position peasants historically have had within Mexican society.

Furthermore, when I draw on Wolf's concept of "closed corporate peasant community," I focus on the notion of "closure" in relation to communal resources. The concept of "closure" has been applied to peasant control of land and irrigation for agricultural production (e.g., de la Peña

1981; Palerm and Wolf 1972; Warman 1980), and I draw on the concept to explore consumption issues related to drinking water. By closure, I mean the process whereby residents of a peasant community form a corporate entity (i.e., a collective, locally based organization) that restricts access to key resources and guards against threats posed by more powerful entities (e.g., the state, industry, capitalist investors) with competing interests regarding the use of those resources. Roseberry (1988, 1989) argues that the concept of the closed corporate community has been misunderstood and often wrongly criticized for referring to a bounded and homogenous entity (parallel to static notions of culture) that is isolated from contact with the outside world. I use Roseberry's (1989:14) concept of community as "a political association formed through processes of political and cultural creation and imagination -- the generation of meaning of contexts of unequal power."

Closure in peasant communities often involves mobilizing organizational power of the local cargo system. Extensive anthropological work about political and religious organization in rural Mesoamerican communities examines the traditional cargo systems (also called civil-religious hierarchies) (Adams 1970; Cancian 1965, 1967; Carrasco 1961; Chambers and Young 1979; Chance and Taylor 1985; de la Peña 1981; DeWalt 1975; Dow 1977; Foster 1967; Harris 1964; Lewis 1951; Melville 1973; Nash 1970; Redfield 1930; Rus and Wasserstrom 1980; Warman 1980; Wolf 1957, 1959, 1966).

Recently, there has been renewed attention to the resiliency and flexibility of cargo systems in indigenous and mestizo peasant communities in Mesoamerica, even as peasants intensify their engagement in nonagricultural activities to make a living (Brandes 1981, 1988; Cancian 1990; Carrasco 1990; Chance 1990; Greenberg 1995; Mathews 1985; Stephen 1990, 1991; Stephen and Dow 1990). Such work reveals marginal groups in Mexico may mobilize the power of local cargo systems and deal with social inequality that threatens their access to resources for daily survival.

Conclusion

In subsequent chapters of the dissertation, I apply this conceptual framework to examine drinking water politics in La Purificación. In each chapter, I explore different political aspects of local drinking water management, which is an ongoing process, a social construct negotiated, debated, defined, and redefined through time. In particular, I focus on the political intentions of those who design, manage, and use the local drinking water system. Political aspects of drinking water management involve a range of issues, some of which I analyze in depth. Other issues, however, I open up for discussion and invite further analysis than what I can provide here. My research is meant to call attention to the complexity of drinking water politics and provide a conceptual approach for further study.

Chapter 2

CONDUCTING ETHNOGRAPHIC RESEARCH IN LA PURIFICACION

This chapter outlines the methods I used to conduct 21 months of ethnographic research in La Purificación. I conducted three months of exploratory summer research from June to August 1993, and 18 months of dissertation fieldwork from January 1995 through June 1996. I guided my research by asking questions about how the community had developed and managed its drinking water system from underground sources and what the system means to local residents. I used a variety of methods to document and analyze political aspects of managing a community-based drinking water system and how these aspects were related to transformations in power relations, social organization, and values within the community. For example, I gathered information about how particular actors gain power and use power in the community as a result of their control of drinking water. Given the literature about ineffective rural drinking water systems, I also gathered data about political factors that local residents suggested might account for the long-term management of a relatively safe and adequate water supply.

Similarly, I documented the meaning of drinking water in daily life and how disruptions in water consumption were related to bodily distress and suffering. To understand how drinking water had become a contested resource, I used an historical analysis of materials from local, regional, and national archives.

I conducted the project in several phases. During the exploratory summer research in 1993, I became established in the community, participated in activities run by civil and religious office holders, and gathered general data about the drinking water system. Upon returning for 18 months of dissertation research in 1995, I conducted 12 months of intensive participant observation in activities related to drinking water management. For the last six months of my research, I conducted oral history interviews with previous office holders, and I collected archival data. I also conducted semi-structured interviews of major participants in the drinking water system and continued limited participant observation of community activities.

Selecting a Research Site

During the course of my research, many residents of La Purificación asked me time and again why I selected their community for my primary field site. I usually responded by explaining both how and why I selected La Purificación. As happens in many anthropological projects, a combination of

chance, opportunity, and theoretical interest shaped my selection.

When I began my research in 1993, I joined a group of graduate students enrolled in an enthographic field school administered by the graduate anthropology program at the Universidad Iberoamericana in Mexico City. After learning about and touring the Northern Acolhuacan region, each student selected a community to conduct supervised research for the summer. The instructor advised us to select only those communities where an anthropologist was not currently working or where there had not been any other previous intensive research. In this way, students would be able to contribute to the long-term comparative analysis in the region (see Viqueira Landa 1992).

I first visited La Purificación during one of the field school's walking tours of the region. By chance, we arrived on the Thursday of the fiesta of Corpus Cristi, one of the community's larger annual fiestas. I was impressed by the elaborate fiesta and, after some inquiry, found out that the community had a large group of mayordomos and mayordomas, locally elected officers (men and women) who sponsor and organize annual religious fiestas. Because the group was so active, I decided to gather information on the mayordomías and the fiestas for a short summer project.

The project, however, turned into more extensive dissertation research after gaining insight into links between mayordomías and drinking water. I learned, for

example, that when a household requested a drinking water connection, a representative of the household was later obligated to serve a year in a mayordomía. If the household refused to fulfill this and other obligations, the community authorities could impose a sanction on the household by shutting off its drinking water supply. This and numerous other examples detailed in the following chapters pointed to the locally-specific politics of developing a community-managed drinking water system.

Selecting La Purificación was also relevant given its long history of community management of water resources and the ecological challenges of transporting water to a semiarid foothill setting that had little access to water sources. In addition, my focus on political aspects of managing a rural drinking water system complements previous research about irrigation and social organization conducted in the region. While I focused my analysis on one community, I drew on previous research in the region to provide a broader comparative perspective.

After completing the preliminary research and developing further research goals, I returned to La Purificación in 1995 to complete dissertation research. During the fieldwork, I rented a small one-bedroom, cement-block house from a family who lived in another house located a few feet away. The house had running water, indoor plumbing, and electricity. My separate living quarters gave me the advantage of a private work space for reading

research materials, typing and storing fieldnotes, sorting photographs, conducting interviews, and filing archival material. At the same time, living next to my host family allowed me to seek advice and guidance on community matters involving a range of things, such as food preparation, shopping, laundry, drinking alcohol, healing, personal safety, visiting, gossip, rudeness, and joking. I learned a great deal about community customs and history from the family, and I practiced my Spanish with them and tested out ways to ask questions to other people about topics related to my research. Being "adopted" into a family also provided me a comfortable, supportive, and relaxing place to retreat from the demands of intensive field research.

Most people I knew spoke only Spanish, and I used Spanish for most of my research activities, including note taking, conversations, tape-recorded interviews, document analysis, and most of my fieldnotes. Some people spoke English, but this was rare. Residents in La Purificación did not use Nahuatl, an indigenous language spoken in the region, but what limited knowledge I had of the language I used with a few Nahuatl speakers from the sierra communities who visited La Purificación as vendors, musicians, and irrigation authorities.

Participant Observation

I used participant observation to gather the bulk of my data, particularly since I was interested in how community

residents organized and used the drinking water system. I participated in community life, particularly in regard to activities related to the use of drinking water in daily life (e.g., drinking, cooking, cleaning, bathing, doing laundry). As I watched and listened over the months, I explored the meaning of drinking water and the meaning of disruptions in water consumption. When possible, I elicited participants' comments during conversations, and I routinely wrote brief notes about their comments and activities in a small notebook that I carried with me at all times. As people became accustomed to me writing notes in front of them, they would often tell me to write certain things down. At times, people told me not to write certain things in my notebook, and I honored such requests. After my observations, I used the brief notes to write more detailed and expanded fieldnotes within 24 to 48 hours on my portable computer.

Over time, the detailed collection of observational data in the community focused on the civil and religious authorities, and I explored how authority over drinking water was related to means of livelihood, gender issues, residency status, and orientation to urban areas. As I describe in later chapters, the community's civil and religious office holders coordinate activities and make decisions that directly and indirectly influence drinking water management. I observed the civil management of the drinking water system, and I was present during many

specific activities related to drinking water management such as drinking water committee meetings, policy discussions, water shut offs, and faenas of drinking water projects. I also observed general activities of the community's civil delegación (community meetings, council assemblies, civil celebrations), irrigation management, faenas (corvee labor; see Chapter 4), mayordomías responsible for maintenance of the church and organization of annual religious festivals, and, to a limited extent, ejido activities. In a few instances, I tape recorded community assemblies about water issues, public religious events, and public medical lectures about waterborne diseases. When possible, I also accompanied local authorities to the offices of the Municipio of Texcoco and the Comisión Nacional de Agua (CNA) in Mexico City.

By working with over 100 civil and religious office holders, I developed extensive social networks in La Purificación. This included regular interaction with about 80 religious office holders (40 representatives were elected in 1995 and another 40 in 1996) and about 20 representatives elected to civil offices for the 1994-1996 term. I used participant observation to collect data on civil and religious activities, which allowed me to collect a range of materials from people of differing backgrounds and generations. I also collected extensive notes and photographs of public activities in the delegación and the church. I also visited many office holders in their houses,

attended their life-cycle rituals (e.g., birthdays, weddings, funerals), and became acquainted with extended family members. This interaction allowed me to make direct observations of household water use in an unobtrusive manner.

Sometimes, I found drinking water to be an elusive topic to research by asking questions, so I depended a great deal on collecting information from observations. Water is a central aspect of daily life, but its use and management are routinized and not readily accessible on a discursive level. For example, when I asked about what it was like before and after the installation of the piped water system, I often received general responses. However, conducting participant observation of water management and living in the community for an extended period of time gave me opportunities to make first-hand observations of drinking water use and management. During periods when the community's drinking water system was shut down, I took detailed notes and photographs about people using alternative sources for water they had relied on before installing the current drinking water system (irrigation water, jagüeys, shallow wells, rainwater). Water shortages were also key moments when people readily offered comments about "suffering from water" and the importance of drinking water in daily life. In these ways, participant observation allowed me to collect detailed information about drinking

water, which I used to develop more effective questions for semi-structured interviews.

I also attended community assemblies and a water commission that went house to house collecting money from debtors, noting anomalies (e.g., water theft), and listening to people's complaints. During the same time, I conducted participant observation of drinking water projects, such as constructing a new water storage tank with months of weekly cooperative labor, digging ditches, laying new water pipes, and fixing water valves. I explored some aspects of irrigation and participated in annual community labor to clean irrigation ditches as well as new projects to build a new dam and deal with agrarian reforms related to irrigation management. Participation in these projects gave me opportunities to listen to and collect information from residents as they discussed the importance of water for domestic purposes.

I focused on a wide range of community issues related to drinking water, including: problems with distribution of drinking water in the community; lack of cooperación on the part of newcomers and the anger of established residents at the resulting deterioration in the administration of water resources; the use of "drinking water" in other activities such as small-scale agriculture, small businesses (e.g., hair salons and restaurants), and construction of houses; the concern that urban centers would take water from the region; and the growing problem of how to manage drainage

and sewage issues. Because water management is political, some information is difficult to obtain directly. Only by doing long-term observations and developing rapport was I able to gather information about unauthorized drinking water connections, shutting off drinking water, and inappropriate uses of drinking water. This information was difficult to obtain by direct questioning early in the research.

I also focused my data collection on perspectives and practices about suffering related to inadequate water supplies and the relative importance of mobilizing the local civil and religious offices to address political aspects of this suffering. The study elicited and recorded concerns about household water consumption in conversations and actions related to household relations, the civil and religious office system, the arrival of new residents to the community, and government policies regarding water resource management. I analyzed fieldnotes and tape-recorded, semi-structured interviews to understand the cultural construction of bodily distress associated with drinking water disruptions (e.g., water shortages, uneven distribution of water in the community, and pollution), and how people linked such disruptions to specific social processes such as in-migration and socioeconomic differentiation.

Many of the observations took place in public settings, such as the community's civil government hall and the local Roman Catholic church. I collected information about how

office holders of the mayordomía maintained the church for life-cycle rituals (e.g., baptisms, birthdays, weddings, funerals). I also collected information about how the office holders of the mayordomía interacted with the resident priest. Other than one Roman Catholic church, there were no buildings for worship in the community, but there were Roman Catholics and non-Catholics who did not accept religious posts. A group of Jehovah's Witnesses met regularly in a person's home, and there was conflict between this group and the community regarding fulfillment of customary community obligations. I did not observe meetings of this group.

I gathered information about conflicts within the community, especially between established residents and new residents. I examined how the intensification of these conflicts related to socioeconomic stratification, in-migration, and the use of the market to distribute water resources. However, my data focus mostly on the views of established residents, especially those with ties to agriculture in the middle socioeconomic strata of the community. Established residents had more information about historical processes and they directly managed the drinking water system. I gathered useful but limited data from new residents. This meant that I have more information from residents born in the community, with extensive kinship ties in the community, who participated in the local Roman Catholic church, and had ties to agriculture. Less

represented are views of newer arrivals with fewer kinship ties in the community, with less participation in civil or religious offices, and with few ties to agriculture.

Photography

Photography played a central role in the project. I literally took hundreds of pictures and slides to document my observations. People often called me "the photographer" and "reporter" when I covered local events. In most cases, I recorded notes about the activities and conversations that were taking place when I was taking pictures. In addition, I used photography as one way to elicit people's views about community life in La Purificación. I routinely traveled to Texcoco to develop rolls of film within a few days of taking pictures. I organized the photographs in chronological order in a series of albums, and I carried the albums to people's houses and social events. I recorded responses and comments about the photographs when I showed the albums to people. Many of the photographs were about public events, such as fiestas, faenas, water shortages, agriculture, and household organization. Over time, people regularly offered to show me their photographs of public events, which provided me additional information and clarified issues about previous decades.

For research concerning water management, photography turned out to be a useful way to document the changes in water projects that extended over months. This also added a

participatory dimension to the research, since it allowed people to view what I was doing and observing in the community, and they suggested other activities I should do and other photographs I should take. Furthermore, as a form of reciprocity, I gave people photographs of the creative and expressive aspects of their lives, and I donated photographs to civil and religious officials so that they could document their contribution to community projects.

Semi-Structured Interviews

After gathering extensive information from observations and people's comments about water management, I carried out a series of tape-recorded, in-depth, semi-structured interviews with civil and religious office holders. I developed an interview guide, used it with three people to check for wording and the time it took to administer it, and then revised the guide so that I could finish an interview in one hour. During the interviews, however, people often took more time answering qualitative questions and raising other important issues.

I interviewed 41 people (from 37 households) who were willing to participate in semi-structured interviews and oral histories about community customs and the community's drinking water system. Table 2.1 summarizes the characteristics of the semi-structured interview participants. The interviews included 33 men and women who were involved in civil and religious offices at the time,

Table 2.1 Semi-Structured Interviews

Participants	Number
Sex	
Males	26
Females	15
Socioeconomic Status	
Upper Stratum	6
Upper-Middle Stratum	10
Lower-Middle Stratum	15
Lower Stratum	10
Residency Status	
Established Resident	29
New Resident	12
Offices	
Civil Offices	27
Religious Offices	14
Barrio	
Barrio de la Concepción	11
Barrio de Santa Teresa	25
Ampliación Santa Teresa (la colonia)	5
Age	
20-29 years old	5
30-39 years old	9
40-49 years old	15
50-59 years old	4
60-69 years old	5
70 + years old	3

Note: See Chapter 4 for description of Socioeconomic Stratification and Residency Status.

and 8 other men and women who provided extensive oral history information. Additionally, 4 of the 33 office holders provided supplemental history information. There were 26 men and 15 women, ranging in age from their 20s to their 90s. I conducted joint interviews with 6 married couples (12 individuals). I characterized the 41 participants in terms of four socioeconomic strata (see section in Chapter 4 on Socioeconomic Stratification): upper stratum (6), upper-middle stratum (10), lower-middle stratum (15), and lower stratum (10). I included 29 people who identified themselves as established residents (primarily because they were born in La Purificación) and 12 others who were newer residents (most were born in Mexico City or in other states in Mexico). Chapter 4 provides more information on residency status. Some of the new residents were married to established residents or had other kinship ties to established residents. Every interview participant had some elementary education and was literate, and a few had education beyond secondary school.

In most cases, I drew on the interview data to understand general views found in the community. In a few instances, I present quotes from my interviews, and I report the data using pseudonyms. Sometimes, I refer to the person with the general term "water authority" or "authority" as a way to conceal the identity of a specific office holder. This includes information from representatives of the drinking water committee as well as other civil office

holders (delegados and representatives of the citizen's participation council, the irrigation committee, and the ejido).

Because established residents were in positions of directly managing the community drinking water system, I interviewed more established residents than new residents. As I observed water management activities, I scheduled interviews with people who participated more often in community service. I also sensed a greater reluctance on the part of people who did not participate in managing the water system and who, therefore, did not know me. Furthermore, in contrast to the optimism I noted in 1993 as a result of new economic programs, particularly the North American Free Trade Agreement (NAFTA; Tratado Libre Comercial, TLC), I sensed during 1995-1996 that people were strained by the economic crisis and were less able to participate in my research. People lost their jobs, and many people were busy looking for alternative sources of income. This made it difficult to contact people and elicit participation, even from people whom I knew for a long time. Therefore, I gathered data from participant observation and from selected interviews from people with whom I was most familiar due to my involvement in community life.

I interviewed 27 people primarily about their current and past participation in civil offices and issues related to drinking water. The civil offices included people who served on the committees in the delegación, representatives

of the drinking water committee, the delegados, the citizen's participation council, and the irrigation committee. I also interviewed representatives of the ejido, the social patrol (guardia social), the drinking water commission, and people who participated in drinking water faenas. I interviewed 14 people primarily about participation in religious offices, and I asked questions about how the office related to drinking water issues. There was some overlap between the two groups since people had participated in both civil and religious offices.

Selecting a sample of those who had held or who were then holders of offices in the civil-religious hierarchy had a number of advantages: participants knew me and readily offered me sensitive information about the political issues related to water management; interviews included both men and women (but more men) from all barrios; the participants had a range of backgrounds and perspectives; and the interview data could easily be cross referenced with data from observations, census, and documents. This interview sample had limitations: it was a small sample for a population of about 3,500 residents; as with participant observation, the interviews favored established residents with limited data from new residents (who were less likely to be elected to offices involving water management); and it was not statistically representative of the population. Overall, the research conditions and the research problems

suggested that this sampling procedure was an appropriate way of gathering a rich data set.

For each interview, I contacted the person to set up a time and place for an interview within a few days. For most interviews, I visited each person in his or her house, and in a few instances, I interviewed the person in my house. If I went to the person's house, we often talked for hours and shared a meal together. The interviews generally lasted two to three hours, but my visit often lasted up to five hours if it involved a meal and if people wanted to look at photographs. I transcribed the tapes and coded them for topics and themes. This allowed me to do a qualitative analysis and select information, words, and quotes to illustrate representative trends. The sample was not statistically representative of the population, so I did not do a statistical analysis.

The purpose of the interviews was to gather a range of data about political aspects of water management. In addition to demographic information (e.g., age, education, employment, household membership), I collected specific information about water management, water consumption, community obligations, and previous offices held. I used broad, open-ended questions to elicit data on the following issues: the advantages and disadvantages of the way the community manages its drinking water system, the way of appointing people to run the water system, the use of specific policies regarding water fees, the use of

obligatory community service to develop the water system, the idea of having another outside organization run the water system, the effects of the current economic crisis, the concept of suffering from water, and health issues associated with drinking water. I used more restrictive open-ended questions to elicit data on the following issues: practices to purify water before drinking it, specifics about the quantities and uses of water for the household, types of water storage, participation in community service, water fees and how they are paid, and opinions about community resolutions passed in recent meetings.

Overall, the interview data contain specific information about water management that I did not gather with participant observation. The participants were representatives in the community's civil and religious offices, the ones responsible for making decisions about water. By focusing on this group for interviews, I was able to gather information from people with a variety of ages and backgrounds and from people who lived in different barrios of the community. This occurred because of the method of electing representatives for such posts also rotates in the community and extends across sections of the community nucleus.

Documentary and Archival Analysis

I consulted a number of archives to gather information about 20th-century processes of developing and managing a

drinking water system from underground sources in the region. The list of archives is included at the beginning of the bibliography. The archives hold a range of materials, including letters, technical reports, water policies, census data, and minutes of meetings. The materials were written in Spanish, which I entered directly into computer files with a portable computer taken to the archive. In some cases, I had permission to photocopy materials. I translated all of the direct quotes from archival materials into English. In the text, I cite primary sources with footnotes, and I cite secondary sources as part of the list of bibliographic references.

I focused on the postrevolutionary period (i.e., after 1910) to the present, which brought a major shift in the use of land, labor, and water in the region. Postrevolutionary water laws continue to influence the development of surface water for domestic use in the region. I also focused on documents from the period of the 1960s to the present, the period when the community began developing underground water sources. Also I draw on the legal context of irrigation and water management over this century to understand the implications of new federal water laws.

Because of a number of changes in federal law, I consulted government sources about new policies and programs regarding regional water resources (e.g., see Leyes y códigos de México 1994b). In addition, I consulted the newly created Historical Archive of Water (Archivo Histórico

de Agua, AHA) in Mexico City. This contained specific documents about La Purificación and its water resources as well as more general information about the history of water in Mexico. From the archives of the Instituto Nacional de Antropología e Historia (INAH), I gathered some limited data about the community's Roman Catholic church building and other historical monuments in La Purificación. I gathered a limited amount of historical information from the Archivo General de la Nación (AGN).

I consulted numerous documents in the archives of the local delegación and the drinking water committee. Among the oldest documents, I gathered information about colonial water grants from the late 1700s. The older documents provided historical data not covered elsewhere in ethnographies of the region. In addition, I read a number of specific documents in the delegación, including papers from the drinking water committee dating from the 1960s when the community first initiated the well drilling projects. This allowed me to record per year the number and gender of registered water users, water fees, and amount of water debts. Civil records also included information about water quality tests. To a lesser extent, I examined relevant documentary information about the irrigation system, community service, public works projects, and the ejido.

Civil authorities also had conducted a community census in 1994, but they had not synthesized all of the information. With permission, I summarized the community

census data, which allowed me to characterize general demographic characteristics without spending time carrying out my own census. In addition, the census asked information about drinking water and irrigation. The census data are incomplete, but I suspected that my own census would have been equally problematic. I identified trends in the census data and compared them with other government census data to characterize the community's population, economic activities, landholdings, levels of education, and use of water resources.

In addition to civil records, I consulted a number of other records in the community. I used data from the local health clinic regarding recent community health trends. I examined church records about people who have held office in the religious cargo system through the century. This provided information about the changes in the religious posts and their relation to general social organization. For example, I used lists of names of office holders to examine the organization of the religious cargo system, particularly regarding new residents and people who do not use irrigation water. Further, during oral history interviews with former civil and religious office holders, I examined personal records, dating back to the 1940s, which included lists of previous office holders, diaries, letters, photographs, and receipts for collection of money for water projects. This information was valuable for piecing

together the place of surface water in community life and the efforts to develop underground sources.

I reviewed data about the control of drinking water in La Purificación in the ethnographic archive of the Universidad Iberoamericana. The archive contains information based on observations and interviews by other students and researchers who have made walking tours in the region, and it includes written observations by researchers who had conducted more extensive summer projects in La Purificación in the 1970s and 1980s. In addition, I collected some comparative data on other communities to examine regional drinking water issues. Information on the characteristics of drinking water systems in nearby communities is contained in the ethnographic archive and some published works (e.g., Gómez Sahagún 1992; González Rodrigo 1993; Lane Rodríguez 1994; Millard 1994; Rodríguez Rojo 1995; Palerm Viqueira 1993, 1995). I also drew from a government publication about La Purificación (INEGI 1995). Some of the archival data are sketchy and incomplete, but the data provide valuable insights that have not yet been published. Also, the data allowed me to use information that I could then test out in subsequent interviews and observations. I relied on the ethnographic data to the extent that I was able to verify the data with my own observations and interview data.

Chapter 3

LIVING IN NORTHERN ACOLHUACAN

This chapter outlines the broad ecological and historical characteristics of Northern Acolhuacan, the region in which La Purificación is located. Wolf and Palerm (1955) first referred to the region as Northern Acolhuacan. In the following section, I synthesize this and other major works by Palerm and Wolf (1972), Palerm Viqueira (1995), and Viqueira Landa (1994) and published ethnographic articles and monographs of communities in the region (Aldana Martínez 1994; Campos de García 1973; Gómez Sahagún 1992; González Rodrigo 1993; Lane Rodríguez 1994; Millard 1994; Palerm Viqueira 1993; Pérez Lizaur 1973; Rodríguez Rojo 1995; Sokolovsky 1978, 1995). I also draw on histories of the Valley of Mexico that include information about Acolhuas and other indigenous groups present at the time of the Spanish Conquest, as well as information up through the 20th century (Bazant 1977; Gibson 1964; Hamilton 1982; Martínez 1972; Wolf 1959). A variety of sources have maps of the region, including maps of irrigation systems (see Doolittle 1990;

Lane Rodríguez 1994; Pérez Lizaur 1973; Rodríguez Rojo 1995; Wolf and Palerm 1955).

Northern Acolhuacan takes its name from the 15th-century indigenous Acolhua state that was centered in the Texcoco area, on the shores of Lake Texcoco. The region is located on the northeastern edge of the Valley of Mexico in the State of Mexico. Northern Acolhuacan is bounded by hills that are extensions of the Sierra Nevada, and it forms a river-basin that drains toward Lake Texcoco. Acolhua leaders consolidated state rule in the 15th century in the region and united communities from different geographical zones into an economic, political, and religious network. The Spanish Conquest and colonization eroded the consolidated character of the region, but there are still distinguishing regional features that influence contemporary drinking water management.

During my fieldwork, people often referred to the area as the Texcoco region, since Texcoco is the major urban center on the northeastern side of the Valley of Mexico. The region's communities are not as unified as before, and the region is divided into several municipios.[4] La Purificación pertains to the Municipio of Texcoco, one of 121 municipios in the State of México. The community is about 10 kilometers east of the city of Texcoco, the

[4] Some research refers to a municipio as an administrative unit roughly comparable to a county in the U.S. Each state is divided into municipios.

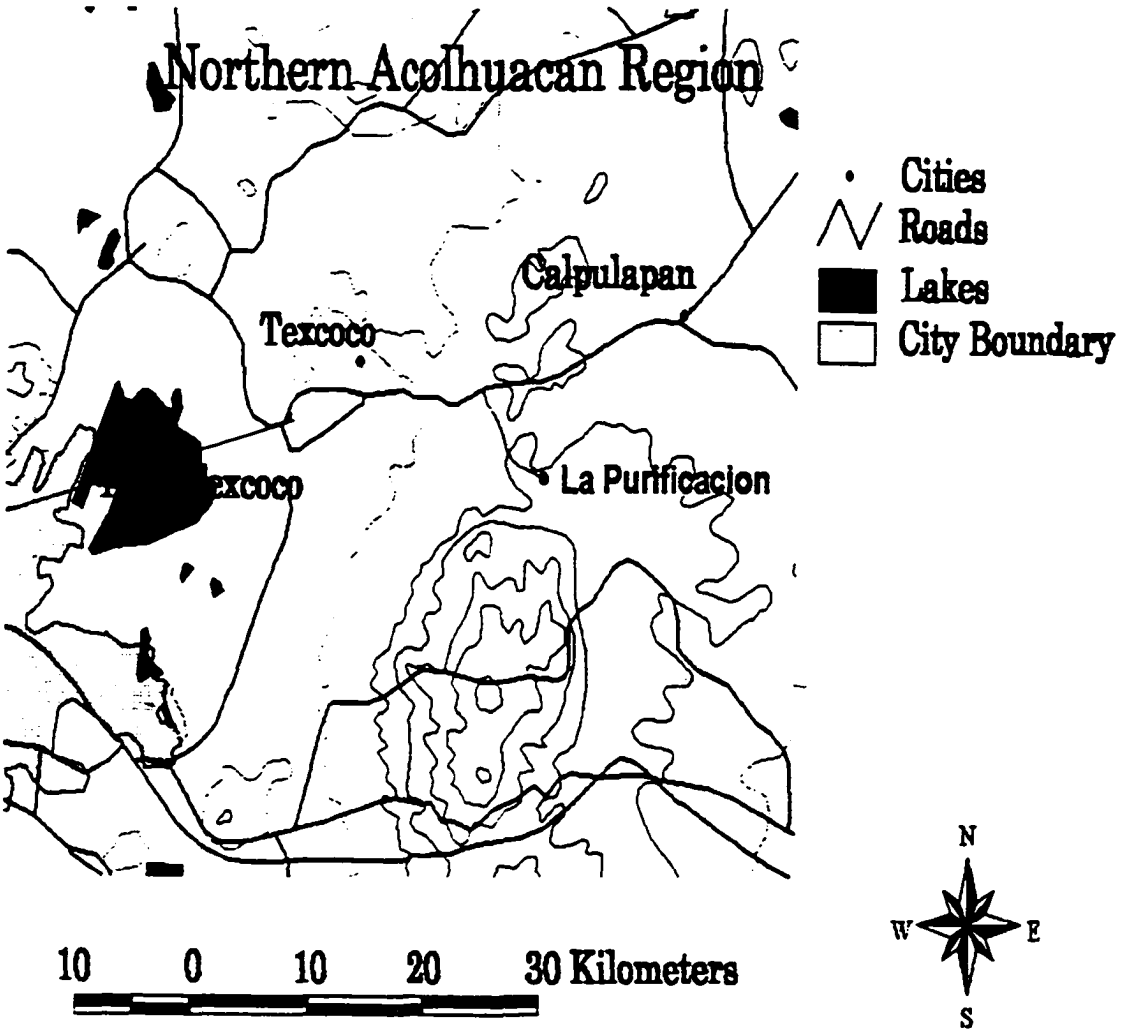
administrative seat of the municipio, and about 30 kilometers northeast of the center of Mexico City.

Northern Acolhuacan extends from the floor of the Valley of Mexico at the edges of the dried bed of Lake Texcoco to the peak of Mount Tláloc (see Figure 3.1). For analytic purposes, anthropologists have divided the region into four ecological zones, which are listed in Table 3.1. The ecological features of each zone influence economic activities and social organization, which I outline in the narrative below. La Purificación is located in the foothill zone. The center of the community, near the Roman Catholic church, is at an altitude of about 2,375 meters above sea level, but households are located perhaps 100 meters higher on the sides of the hills. The ejido plots are located at about 2,225 meters above sea level in the plains zone.

Table 3.1 Ecological Zones of Northern Acolhuacan

Zone	Altitude (meters above sea level)
Plains	2,225-2,350
Foothill	2,350-2,600
Intermediate	2,500-2,750
Sierra	2,650-4,000

Sources: Wolf and Palerm 1955; see also Palerm and Wolf 1972; Pérez Lizaur 1973; Sokolovsky 1995.



Map by Matthew Martinez, Map Library, Michigan State University. Data from ArcView GIS Version 3.0 and Digital Chart of the World, ArcWorld.

Figure 3.1 Northern Acolhuacan Region and La Purificación.

Northern Acolhuacan is classified as a semiarid region. During most years, the rainy season starts in May or June and runs through September, and the dry season has little or no precipitation the rest of the year. The region's annual precipitation averages 641 millimeters (ranging from 600 to 1,200 millimeters) and the temperature averages 14.8 degrees centigrade (Aldana Martínez 1994; INEGI 1995). The area where La Purificación is located has scarce vegetation (due to deforestation) and includes mostly semidesert varieties such as agaves (e.g., magueyes), cactus (e.g., nopales), some small scrub brush (matorrales), and a few native and nonnative bushes and trees, including pirul, ahuehuete, and eucalyptus.[5]

The Acolhua State

Northern Acolhuacan has gone through a number of historical periods marked by changes in the interrelationship of land, labor, and water. Since the earliest records of human inhabitants until the 15th century, the region has had population movements into and out of the area. Some populations relied on foraging and others on small-scale agriculture. Palerm and Wolf (1972) suggest that groups of small settlements in the region

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[5] AHA, consultivo técnico, estudio geohidrológico para el riego de los pueblos de Purificación, San Nicolás Tlaminca, y San Miguel Tlaixpan, Mpio. de Texcoco, Mex. SRH, abril de 1950.

remained marginal to the pre-Hispanic states that emerged in the Valley of Mexico.

In the 15th century, however, the region became integrated into the Acolhua state, whose rulers included the famous "poet-king" Netzahualcóyotl whose administrative center was in Texcoco (Martínez 1972). Inhabitants of the region were agriculturalists who spoke Nahuatl, a language spoken by the Aztecs, Acolhuas, and many other indigenous groups of Mesoamerica at the time (Gibson 1964). Anthropologists have suggested that, during this period, the control over scarce water supplies -- an essential resource for agricultural production -- accounted for much of Netzahualcóyotl's rise to power (Palerm and Wolf 1972). During his regime, Netzahualcóyotl controlled a series of permanent mountain springs located in the sierra zone. The regime expanded and elaborated canal irrigation systems, using innovative technological features not found in other parts of the world (Doolittle 1990).

The irrigation system tapped abundant water supplies from the springs located at colder, higher elevations of the sierra zone. Canals channeled the water to lower, warmer, but water-poor elevations where people could practice intensive agriculture to raise food crops, principally maize, squash, and beans. Scholars suggest that this intensification of agriculture was a response to food shortages (Palerm and Wolf 1972). Sierra communities benefitted from greater food supplies produced at lower

elevations, and communities at lower elevations benefitted from irrigation water for planting before the rainy season, allowing harvest before the onset of winter frost. The increased agricultural production provided food for denser urban settlements and supported nonfood-producing specialists (e.g., political and religious elites, military, artisans).

The extensive irrigation system included water from a mountain spring (that during my fieldwork was called San Francisco), located above the present-day sierra community of San Jerónimo Amanalco. During Netzahualcóyotl's regime, the water emptied into the river Río Coxcacuaco and then into canals that channeled water to agricultural lands below. The system channeled part of this water into the valley of La Purificación and created sets of terraced gardens (Palerm and Wolf 1972). On the mountain of Tetzcutzingo, Netzahaulcóyotl constructed a bath and gardens, allowing water to cascade down the terraced mountainside. Netzahualcóyotl is credited with creating Tetzcutzingo as a botanical and zoological garden of plants and animals from outside the region. Netzahualcóyotl's baths and garden at Tetzcutzingo are part of a registered national monument and tourist site.

Anthropologists have noted that the Acolhua rulers used their power to mobilize a tremendous amount of labor to build and maintain the elaborate hydraulic systems (Palerm Viqueira 1995; Viqueira Landa 1994). This scholarship

describes the emergence of a centralized authority that obligated people to provide labor for regional water projects in exchange for access to irrigation water, and, thus, increasing food production. These efforts, in turn, reinforced a cohesive social organization, integrated people into a series of communities in the different ecological zones, and shaped occupational specializations and trading patterns in the region (see Palerm and Wolf 1972; Palerm Viqueira 1995; Pérez Lizaur 1973; Viqueira Landa 1994; Wolf and Palerm 1955). Netzahualcóyotl granted communities, not individuals, rights to surface water from distant sources in exchange for fulfillment of labor obligations to the community and the state (McAfee and Barlow 1946). In other words, water was a collectively-held resource rather than an individually-held resource. The water grants suggest that the surface water was for both agricultural production and domestic use.[6]

Spanish Conquest and Colonization

The 16th-century Spanish Conquest and subsequent Spanish Colonization replaced Northern Acolhuacan's indigenous system with a new set of political, economic, and

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[6] It is beyond the scope of this study to provide an in-depth analysis of pre-Hispanic and colonial water control, but it is a topic deserving further study regarding indigenous forms of managing water for household use (see Bribiesca Casterjón 1960; Doolittle 1990; Musset 1992; Palerm 1973; on analysis of Aztec systems for providing healthy water supplies, see Ortiz de Montellano 1990).

cultural relations (Aldana Martínez 1994; González Rodrigo 1993; Palerm Viqueira 1993; Pérez Lizaur 1973; Rodríguez Rojo 1995; Palerm Viqueira 1995; Viqueira Landa 1994; Wolf and Palerm 1955). The Spanish established settlements in the plains zone, and the fertile land was taken over by haciendas and their wheat mills (molinos) for producing flour and fulling mills (batanes) for processing wool. Indigenous people were forced to provide tribute, usually food crops, to the Spanish rulers and labor to the large landowners. Large landowners channeled water from the sierra to the plains, taking water away from the foothill zone and using it to irrigate agricultural land and power the mills. Indigenous settlements in the plains diminished when residents were displaced by large landowners and died from exposure to Old World diseases. It appears that, as a result, indigenous people migrated to the region's unoccupied and less desirable foothills. Eventually, a series of foothill communities emerged on marginal strips of land with limited water supplies at the edges of a series of large haciendas and mills. Households engaged in a flexible strategy of subsistence agriculture and labor on neighboring haciendas and mills.

Mexican Independence

There is little information about water control in the 19th century, the period that began with Mexico's independence (1810) from Spain and lasted until the Mexican

Revolution. The system of land, labor and water established during the colonial period persisted after independence. However, without the Spanish Crown's intervention, the haciendas expanded their control over agricultural land, pastures, forests, and surface water in the region (see Aldana Martínez 1994; González Rodrigo 1993; Pérez Lizaur 1973; Wolf and Palerm 1955). Foothill communities, including La Purificación, lost further portions of surface water. Research suggests that community residents appear to have continued making a living by a combination of subsistence agriculture and labor on haciendas and mills (Aldana Martínez 1994; Palerm Viqueira 1995).

Revolution and Agrarian Reform

The 1910 Mexican Revolution marked another major shift in social relations in Northern Acolhuacan. Banditry and fighting between revolutionary armies devastated parts of the area, and oral history accounts indicate that many families abandoned their homes and lands. The haciendas and mills in the region collapsed because of the fighting and because workers left the area. After the revolutionary unrest declined and the 1917 constitution was passed, communities began petitioning the revolutionary federal government to expropriate water and land from haciendas and grant it to campesino communities for agricultural production. As a result, by the 1940s, communities intensified campesino agricultural production and craft

production, but households continued to supplement this with wage labor. The region included both indigenous and mestizo communities, and residents possessed irrigated and nonirrigated land and relied on small-scale agriculture to make a living. Lake Texcoco separated the region from the metropolitan area of Mexico City, so the population remained relatively isolated from the growing urban center. Residents, however, had frequent contact with the city, and many regularly traveled to sell agricultural products in city markets. According to oral history accounts, the trip to Mexico City took many hours and usually involved a combination of travel by foot, animals, and boats. In the next sections, I draw on Wolf and Palerm (1955) and their description of the general characteristics of communities in each ecological zone (see also Gómez Sahagún 1992; Palerm Viqueira 1995; Pérez Lizaur 1973; Sokolovsky 1995; Viqueira Landa 1994). I start with the lower elevation and move to higher elevations.

Plains Zone

The plains zone is a densely settled, compact area, predominantly mestizo, and has had the greatest in-migration of outsiders (see Campos de García 1973; Pérez Lizaur 1973). The area includes urban centers such as Texcoco and Chiconcuac, as well as numerous other smaller communities that are located along the edge of the dried bed of Lake Texcoco. Older residents recall that decades ago they used

Lake Texcoco to collect fish, water fowl, and insects for food and for trade with residents at higher elevations. The haciendas and mills collapsed after the government instituted agrarian reform measures, expropriated land from large landowners, and distributed it to campesino communities. In some cases, the remaining central administrative areas of the haciendas were converted into agricultural schools, such as Universidad Autónoma de Chapingo, Colegio de Posgraduados, and Centro Internacional del Mejoramiento de Maíz y Trigo (CIMMYT). The former hacienda, el Molino de Flores, was converted to a national park, and, in the 1990s, was turned over to the Municipio of Texcoco for operation. Some households rely on subsistence agriculture, and some communities are noted for having a sizeable group of households that specialize in craft production (e.g., the bread makers of San Antonio Tepetitlan and the potters of Santa Cruz de Arriba). The plains zone also has large-scale commercial agricultural operations that produce such things as dairy foods, meat, and alfalfa. Most residents, however, work for wages, and the plains zone has most of the region's industrial, government, financial, and service sector jobs. By the 1930s, most communities in the plains zones had received federal grants for surface water, but many community have lost their water grants to communities in the sierra and foothill zones (Lane Rodríguez 1994). Communities in the plains have drilled deep wells

and tapped accessible underground aquifers, something that was much more difficult to do at higher zones.

Foothill Zone

Communities in the foothill zone have semidispersed settlements composed of mestizo populations (see Aldana Martínez 1994; Gómez Sahagún 1992; Pérez Lizaur 1973; Rodríguez Rojo 1995). Most received federal grants for ejido land in the plains zone and surface water from the sierra zone. The zone has a population engaged in a wide variety of economic activities. Many people make a living by a combination of small-scale agriculture and wage labor. People plant subsistence crops (maize, bean, and squash) in rain-fed lands (usually ejido lands), and in the past few decades have intensified use irrigated private lands to cultivate fruit, flowers, and medicinal plants for sale in urban markets. Many communities have people who cultivate flowers in greenhouses, and some communities have other economic specializations. A majority of wage-earning residents commute to wage jobs in Texcoco, Chiconcuac, and Mexico City. Surface water is used almost exclusively for irrigation and runs sporadically in open-air canals according to a system of rotation among users. Each foothill community usually goes without surface water for weeks while another community receives its share of surface water from the canal. Foothill communities have drilled deep wells in their ejidos located in the plains zone.

Intermediate Arid Zone

The intermediate arid zone is not populated and it is deforested and heavily eroded. In the last ten years, conflicts have intensified among foothill communities to claim portions of this land as official community holdings. Until recently, the land was not considered valuable and communities did not secure their boundaries in the zone. Increasingly, however, people see possibilities for settling the zone, especially as land in other areas has been taken for housing. Also, foothill communities have been starting to construct dams in the intermediate zone to capture and store rainwater and surface water for irrigation.

Sierra Zone

Communities located in the sierra zone are characterized by dispersed settlement patterns and constitute what Texcoco authorities call the Nahuatl zone of the region (see González Rodrigo 1993; Millard 1994; Palerm Viqueira 1993; Pérez Lizaur 1973; Sokolovsky 1978, 1995). Communities in the sierra zone have the highest concentration of people who identify themselves as indigenous, and many speak Nahuatl and engage in practices they consider indigenous. These communities also have the least amount of in-migration of outsiders, and many communities prohibit the sale of land to outsiders (something not seen in other zones). It has an economically diverse population, but it probably has the most people

engaged in subsistence agriculture on private, ejido, and communal lands. The communities claim possession of sierra forests, in which they collect wild plants and animals. Communities also have many people who work as musicians and form bands that are regularly contracted by other communities to perform at annual fiestas. The sierra communities are unable to exploit underground water, so they depend on water from the nearby sierra springs and use it for both irrigation and domestic use. Surface water runs daily in open-air canals, especially in main canals going to foothill and plains communities who have a right to a portion of the water. Within the sierra communities, the surface water is delivered according to a system of rotation among irrigation users.

Increased Population Density

The Mexican Revolution and subsequent Agrarian Reform furnished communities with land and water to intensify campesino agricultural production. However, the region's small-scale agricultural sector has declined, and, at the same time, there have been new opportunities for wage labor and professional employment in industrial, financial, commercial, and bureaucratic sectors. Furthermore, improved infrastructure, particularly new roads, electricity, and schools, have allowed residents to stay in the region and has attracted large number of new residents. As a result, the region has become more densely populated. Viqueira

Landa (1992:3) notes that beginning in the 1970s, the region, "having stayed very isolated for many years, opened itself to an intense communication with Mexico City." These changes have created new opportunities and challenges for developing and managing drinking water systems in communities such as La Purificación.

The major changes have included a steady population increase, decreased percentage of the population working in agriculture, increased reliance on wage labor, increased social stratification (particularly in the plains and foothills), and the selling and renting of agricultural land (private, community, and ejido land) to new residents for residential use. Most communities have extended their boundaries and established colonias, subordinate residential areas where new residents have settled. One analysis of the 1990 census estimated that about 25% of the region's population had originated from other areas (Pérez de Olmo, n.d.). In-migration intensified after the 1985 earthquake in Mexico City, after which the federal government subsidized housing and water to relocate entire neighborhoods of people to Texcoco (and other areas) rather than rebuild neighborhoods in the densely populated inner city. The region has a low rate of out-migration, including to the U.S. Most people have strong economic and social links to Mexico City.

In addition, most of Lake Texcoco has dried up, but there are efforts to restore part of the lake (see

Cruickshank García 1995). In the 1990s, the federal government constructed a major toll road that crosses dried parts of the lake bed and links Texcoco with Mexico City. Professionals, merchants, wage laborers, and students commute daily or weekly by car in less than one hour or by public transportation within two hours to Mexico City. Rodríguez Rojo (1995) has suggested that communities in the region have become "bedroom communities" because a large portion of the population commutes daily to work, sell goods, shop, and go to school in Mexico City and other urban areas. Researchers note that, increasingly, the region almost is becoming contiguous with expanding settlements on the outskirts of the metropolitan area of Mexico City (Palerm Viqueira 1995), especially as squatter settlements in the eastern parts of the Valley of Mexico populate the dried bed of Lake Texcoco.

As Viqueira Landa (1992:3-4) observes, Northern Acolhuacan, despite the increased population density, has the distinguishing feature of "the existence of a peasant (campesino) sector that transcends regional boundaries and that crosses sociological categories . . . . In sum, it is a peasant (campesino) sector that is conservative and innovative at the same time." Ethnographic research points to a general tendency for the region's households to engage in a diversity of economic activities and gain a measure of security by flexibly combining agriculture, craft production, wage labor, and commuting. In fact, in the

foothill and sierra communities, there is a tendency for campesinos to invest wages in subsistence and commercial agriculture, which maintains a campesino character to community life and moderates social differentiation (see Aldana Martínez 1994).

Chapter 4

LIVING IN LA PURIFICACIÓN

This chapter provides an overview of the physical, social, and political environment through which water flows in La Purificación. As a foothill community, La Purificación occupies an intermediate position between the indigenous sierra communities and the mestizo urban centers below. I describe features that reflect a mixture of indigenous and mestizo influences. I also characterize the population in terms of principal economic activities, socioeconomic stratification, and political and religious organization.

The Valley of Purificación

La Purificación is located in a small valley within the foothills of Northern Acolhuacan. A geological report in 1950 describes this area as the Valley of La Purificación, which includes La Purificación and two other foothill communities, San Miguel Tlaixpan and San Nicolás Tlaminca:

> [The three foothill communities] occupy a small valley that has almost a circular form, with a diameter of

> about 3 kilometers. It is crossed (in a general direction from East to West with a medium incline of 1.2%) by two torrential ravines (arroyos) called Barranca de Tlacualtongo and Barranca Seca, and by a permanent ravine called Río Coxcacuaco, that owes its character to, among others, supplies from springs called San Francisco and Atexca, which begin to flow near their sources in the high part of the Sierra Nevada. The small valley, which from now on will be referred to as the Valley of Purificación, is bounded by hills called Tetzcutzingo, Falda de Coco, Santisiquiomo e Ixpantepec, Sierrita de Purificación, Puerto de Santa Teresa (dique) and Cerro de Soltepec (going from South, Southeast, East, North, and Northwest), which almost completely enclose the small valley, and separate it from the Sierra Nevada [sierra zone], located to the East, and from the Valley of Texcoco [plains zone], situated to the West and Northwest.[7]

Founding the Community

Before the Spanish Conquest, the foothills where La Purificación is now located had few nearby sources of surface water and the area did not seem to have a settled population (Palerm and Wolf 1972). Archeological evidence, however, indicates that indigenous populations living in settlements at lower elevations used land in the small valley as a set of agricultural fields irrigated with water from distant sierra sources (Doolittle 1990). Terraced hillsides and an old canal residents call huehueyapan are some of the remnants of the indigenous irrigation system that exist in the hills above La Purificación.

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[7] AHA, consultivo técnico. Estudio geohidrológico para el riego de los pueblos de Purificación, San Nicolás Tlaminca, y San Miguel Tlaixpan, Mpio. de Texcoco, Mex. SRH, abril de 1950. Exp. 1,707.

According to current residents of La Purificación, it is a well-known local legend that their ancestors had been living in a settlement that had been located at a lower elevation in the plains zone where La Purificación's ejido lands are presently located. The legend suggests that after the Spanish Conquest the plains settlement became known as La Asunción, but later it was ravaged by plagues during an early period of Spanish colonization. As a result, a few people from La Asunción migrated to the foothills to escape sickness and death. The new site was supposed to be purified of disease. When the new settlers founded a Roman Catholic church, they chose as its patron La Virgen de la Candelaria, representing the purification of the Virgin Mary after giving birth to Christ.

Part of the legend is supported by historical evidence. Dates of the oldest buildings indicate that people settled the area in the 17th century and called it La Purificación Tepetitla. At the same time, haciendas emerged and took control of land in the plains zone. To my knowledge, all of the communities in Northern Acolhuacan are known by a Spanish name of a Roman Catholic saint or virgin and by a Nahuatl place name. In this case, Tepetitla is a Nahuatl word that means "under or at the base of the hills," and probably refers to the fact that the settlement is surrounded by a series of hills. The Roman Catholic fiesta for the community's patron virgin takes place on February 2, and celebrates the day when the Virgin Mary, following

Jewish custom, went to the temple to present her newborn child and be purified 40 days after giving birth. Images of the virgin show her carrying the newborn Christ in one arm and holding a candle in the other. The fiesta of La Virgen de la Candelaria (called Candlemas in English) is widely celebrated in Mexico, and, in a sense, officially closes the Christmas season.

Significant Landmarks

The community nucleus of La Purificación consists of the central sections that have been settled for centuries. Outside the nucleus, in the plains zone, newer sections include a colonia and ejido plots. Since its founding and up through most of the 20th century, La Purificación has been divided into two main sections, usually referred to as barrios. Many communities in Northern Acolhuacan recognize two main barrios, which some observers relate to a practice in indigenous communities of recognizing two halves and distributing rights and obligations between the two halves (Palerm Viqueira 1993). In La Purificación, people commonly refer to the two halves of the community. The western half, Barrio de la Concepción, takes its name from the chapel for La Virgen de la Concepción. The eastern half, Barrio de Santa Teresa, takes its name from the 19th-century chapel honoring Santa Teresa. Both chapels are registered national historical monuments. Local documents suggest that the barrios were known by Nahuatl names at the end of the 19th

century. Barrio de la Concepción was called Tlaylotlacan, and Barrio de Santa Teresa was called Chimalpa.

The community's principal road (and only paved road), Avenida Tepetitla, runs east and west and divides the community into north and south sections. The road was formerly called Avenida Juárez, but in the 1980s the local civil authorities placed street signs and designated the main road and all the previously unnamed streets with Nahuatl names that corresponded to names of properties bordered by the streets. In the 1980s, as the population increased, the drinking water committee began identifying water users by four barrios: Barrio de la Concepción Norte (North), Barrio de la Concepción Sur (South), Barrio de Santa Teresa Norte, and Barrio de Santa Teresa Sur.

Outside of the community nucleus, the community established a colonia in the 1960s, which is located at a lower elevation. Officially, this area is designated as an extension (ampliación) of Barrio de Santa Teresa. Most residents commonly referred to the area as simply "la colonia" or "la colonia Santa Teresa." Local authorities, however, list it officially as La Ampliación Santa Teresa, to reinforce the idea that it is a distinct, but subordinate, administrative unit of the community. Residents of the colonia distinguish two subsections, the upper part and the lower part. Since the mid-1980s and in connection with drinking water management, community authorities have begun recognizing five administrative units

of the entire community, even though residents often disagree about the number of units: five barrios; four barrios and a colonia; or two barrios with various subsections.

The physical space reflects the influence of Spanish colonization and the creation of a body of civil and religious authorities. The church (another registered national historical monument) and the small chapel honoring another representation of the Virgin Mary (La Virgen de la Concepción) were built in the 17th century. The church has a baroque architectural style referred to as churrigueresque, and the building is noted for having some of the most elaborate and beautiful surface decorations in the entire region. Local tourist information, for example, regularly features La Purificación's church as a unique architectural highlight of the Texcoco region. Local pride in the church is reflected in a major restoration project completed during the economic crisis of the 1980s.

Archival information indicates that, during the 1700s, La Purificación was both a political center (cabecera) and a religious center or main parish (parroquia) for a series of foothill communities, which were referred to as its barrios (neighborhoods or subordinate communities). Since colonial times and up through most of the 20th century, La Purificación's church buildings have signified a close association of religious and civil authority and have served as the physical and symbolic center for the community. The

church and its adjacent buildings have long served as the setting for religious ceremonies (e.g., weekly masses, weddings, baptisms, funerals), a residence for the parish priest who traveled to other parish communities (previously called barrios) to perform religious service, and as offices for religious authorities (priests and locally elected officers called mayordomos). At least during most of the 20th century, the civil offices were also located in the church buildings and included a storeroom used occasionally to jail people before sending them to municipio authorities in Texcoco. Civil authorities conducted council meetings and general community assemblies in the parish offices. One room was also used as an primary school for girls (grades one through three), and, directly in front of the church, the walled courtyard was the community's main cemetery. In front of the walled courtyard, a plaza was used for both civil and religious functions. A small stand was used to hold the Mexican flag for patriotic festivals. The community used, and continues to use, the church bells to announce religious events as well as civil events and local emergencies (e.g., house fires and robberies).

Over time, however, local civil and religious activities have become separated, a process that is represented in changing use of the church's physical space. For instance, in 1906, responding to federal secularization policies, the community built a civil cemetery (a registered national historical monument) in the plains below. The

cemetery in front of the church was converted into a garden of fruit trees and flowers, which hide most traces of the graves. Additionally, further down Avenida Tepetitla, there is a 19th-century building that was a boys' primary school. In the 1960s, the community built a new primary school in front of the former boys' school, and the boys' primary classes moved to the new school. The girls' primary classes left the church building, and girls joined the coeducational primary school. In 1968, the civil authorities moved their offices (delegación) and jail space out of the church and into the former boys' school building. This building became known as the delegación and was also registered as a national historical monument.

In the 1970s, the community constructed a cement plaza in front of the church's walled courtyard and converted it into a public space that many consider the major gathering place for the community. To one side of the plaza, the community constructed a soccer field. In recent years, the central plaza has been used most often for religious ceremonies and festivals. Civil ceremonies (e.g., Mexican Independence and Mexican Revolution celebrations) have been moved to the cement plaza in front of the primary school and the civil offices. This space consists of the delegación, the primary school and its plaza, two basketball courts, and a bakery, recently constructed with funds from PRONASOL, the Mexican government's National Solidarity Program, which funds development projects for poor populations (see section

below, Political and Religious Organization, for explanation of the Solidarity program). This new civil plaza area is becoming another local gathering place.

La Purificación's Roman Catholic church is part of the Diocese of Texcoco and has the administrative offices of a parish (parroquia) composed of La Purificación and four neighboring foothill communities (San Juan Tezontla, Santa Inés, Santa Cruz Mexicapa, and San Joaquín Coapango). The parish priest lives in La Purificación and travels to the other communities to administer religious services in each community's chapel (capilla). Each community elects a group of men and women to local offices in the mayordomía who care for each chapel and sponsor the annual cycle of fiestas. People from other communities in the parish visit the parish office in La Purificación to schedule masses (e.g., weddings, funerals) and request documents (e.g., baptismal certificates). During the colonial period, two other foothill communities (San Miguel Tlaixpan and San Nicolás Tlaminca) were listed as barrios within the parish of La Purificación, but they later formed their own parish and became officially designated as communities. In addition, the parish used to include three sierra communities (San Jerónimo Amanalco, Santo Tomás Apipilhuasco, and San Juan Totolapan). In the mid-1980s, however, the Diocese of Texcoco reorganized the parish and formed a separate parish, consisting of the three sierra communities and two other

sierra communities (Santa María Tecuanulco and Santa Catarina del Monte) from a nearby parish.

The community is no longer a small semidispersed agricultural community with a Roman Catholic church building as the civil and religious center. Especially since the 1970s, the community has become more compact and populated with many nonagriculturalists. Many of the changes are reflected in the buildings along Avenida Tepetitla. For example, in addition to building the six-year primary school, the community built a kindergarten, a three-year technical secondary school, and a public library. During my stay, two bus lines provided daily service to Texcoco about every 20 minutes most of the day, and cars and trucks zipped along the road daily. Restaurants (2), small grocery stores (10) and other small businesses (e.g., butcher shop, stationary store, hair salons) are located along the main road. Each Wednesday, 10 to 20 vendors set up an outside market (tianquis) in the central plaza to sell fresh produce, meat and cheese, prepared food, as well as other staples (e.g., rice) and small household items (e.g., soap, pots, and pans). On weekends, local vendors dot the main road to sell locally-prepared food (e.g., tacos, tamales, tlacoyos, carnitas) to residents and weekend visitors. At the end of the road is a regionally well-known restaurant that on weekends attracts out-of-town visitors, who come to drink pulque (an alcoholic beverage made of maguey plants) and eat barbecued meats, tacos prepared with handmade

tortillas, rice, and other such foods in a rustic, countryside setting.

La Purificación has a public medical clinic funded by the Instituto de Salud del Estado de México (ISEM; Health Institute of the State of Mexico) and staffed by a full-time nurse. Each year, a medical student in his or her last year of medical school training, arrives as a pasante and fulfills one year of full-time social service before entering an internship program. The community has a private physician, two private dentists, and a small pharmacy. Several men and women are recognized as healers (curanderos and curanderas), including at least two bone setters (a huesero and a huesera) and people who prepare and sell locally grown medicinal plants.

The community has electricity, street lights, public telephone booths (with unreliable service), and household telephone service. There is no public sewage system, so most households drain human waste or "black water" (aguas negras) into septic tanks, onto their property, and, in a few cases, into the streets and irrigation ditches. People usually drain water from washing dishes and clothes or "gray water" (aguas grises) into septic tanks, onto their properties, or into the streets.

In addition to the 17th-century Roman Catholic church and its ornate bell tower, a large white cross on top of the hill overlooking the community has become an important landmark and symbol of the community. In 1987, the priest

led an effort to construct the cross as one way to bless the community and protect residents from malevolent forces. The cross is visible from miles around as a regional landmark, and is lit up at night. According to one community resident, airline pilots use the cross as one landmark when flying in the Valley of Mexico. In September, the community hosts an annual festival, la fiesta de la Santa Cruz, on top of the hill near the cross. The festival consists of religious ceremonies and tourist attractions.

Private and Community Lands

Within the community nucleus, people own most of the land as private property, and there is little land not assigned to individuals for residential and agricultural use. Some lands are considered community property (e.g., the church, soccer field, the schools) and some land that is unsuitable for agricultural or residential use (e.g., steep hillsides) is also community property that can be used by any community resident for such things as pasturing animals and collecting wild plants. All of the private and public properties are referred to by Nahuatl names or by Roman Catholic saints or virgins. People often use property names as addresses, since, until the 1980s, most streets did not have names and the houses did not have numbers. However, electric and telephone companies have begun insisting that houses use numbered street addresses for the companies to mail customers monthly bills.

Before the 1970s, a typical housing unit accommodated an extended family in a number of adobe buildings surrounded by privately-owned irrigated and terraced plots of land (3,000 square meters or larger), where they cultivated such things as subsistence crops (e.g., maize) as well as fruits, flowers, and medicinal plants for sale in markets in Texcoco and Mexico City. Lands located in the surrounding hills are considered community property for residents to use for pasturing animals and gathering wild plants (e.g., nopales, tunas, medicinal plants, herbs, mushrooms).[8] Since the 1970s, with an increase in population and a decrease in agricultural activity, residents have divided their agricultural land into smaller plots (less than 500 square meters) for residential use for their growing families or to sell or rent to others for residential use. Some residents have also been settling on community lands at higher elevations, either as squatters or by claiming to have written proof that the land was private property they inherited.

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[8] Residents refer to the public land as "community property" (propiedad de la comunidad) and land for "communal use" (uso común). It is public land that is used in common by community residents, but it has little agricultural value. It does not carry the official designation as "communal land" (tierra comunal) for agriculture as is the case in nearby sierra communities (see González Rodrigo 1993; Sokolovsky 1995).

Ejido Land

In addition to the private and community land, La Purificación has a federally-granted, nonirrigated ejido, which is agricultural land held collectively (also characterized as land held corporately) (see Warman 1980:307; Stephen 1991:279, 1998:354). The land was given to the community as part of the federal government's postrevolutionary agrarian reform programs (see Chapter 5). For my purposes, an ejidatario (male) or ejidataria (female) is a person who possesses an ejido plot and may have other private plots and rights to irrigation water. In 1929, the agrarian reform programs granted La Purificación land expropriated from nearby haciendas. The ejido is located immediately below the settlement in the plains zone at about 2,225 meters above sea level. The ejido has about 260 hectares, with 219 hectares partitioned among 171 individuals (145 ejidatarios and 26 ejidatarias) (see INEGI 1995). Initially, residents gained access to the ejido land by forming a union of all interested residents and requesting land through the agrarian reform program. Land was partitioned according to the number in the union, and individuals obtained possession but not ownership of a plot. After that, an individual ejidatario or ejidataria was prevented from selling or renting the land, and one usually gained access to a plot through inheritance. In a few rare cases, an ejidatario or ejidataria could give up the land to the ejido union, and ejido authorities would reassign the

plot to someone else. The plots range from 0.8 to 1.6 hectares (depending on the quality of the soil). The remaining 41 hectares of poor quality, hilly land is reserved for "common use" (uso común), meaning all individuals who possess ejido plots could use it for pasturing animals and gathering plants (INEGI 1995). In practice, however, other residents without ejido plots also use the land.

The majority of the ejido plots are rain fed (de temporal), but in 1970 a group of 33 ejidatarios drilled a well to irrigate plots with better quality soil. For the most part, however, this irrigation system has been little used and a low priority, and in the past few years a broken pump has prevented the group from using the well. For most of this century, ejidatarios and ejidatarias have planted maize, beans, squash, and wheat, and in more recent years have been cultivating nopales and raising sheep to sell to local restaurants.

The original grant from the agrarian reform program did not grant land for human settlement. Nevertheless, the community formed the previously mentioned colonia in an area composed of ejido and community land. In many cases, houses were built on small plots (250-500 square meters) and many literally were built with their outside walls touching each other. Because of land pressures in the community's nucleus, some established residents have been converting fertile ejido land into areas for houses and businesses.

Currently, about 10% of the community's population now resides on ejido plots, and some families have built up to four or five houses on individual plots.

The idea of building houses on ejido plots has become more attractive because of the recent possibility of privatizing ejido land. This was part of the Mexican government's PROCEDE program (Programa de Certificación de Derechos Ejidales y Titulación de Solares Urbanos; Program for Certifying Ejido Rights and for Granting Titles to Settled Plots of Land). In 1994, as part of PROCEDE initiatives, government officials measured and delineated legal property boundaries of the ejido plots, and the government issued titles of possession to individual ejidatarios and ejidatarias (INEGI 1995). In addition, government officials and ejidatarios and ejidatarias agreed to divide the plots reserved for common use, set legal boundaries, and issue titles to individual ejidatarios and ejidatarias. In 1996, representatives from the Procuraduría de la Reforma Agraria informed the community that some households in the ejido could obtain private titles for the plots of land in the colonia. Other efforts to privatize the entire ejido have been discussed in the community, but, during my fieldwork, the community had not yet allowed individuals to buy and sell plots without permission of the entire voting body of ejidatarios and ejidatarias.

Population and Principal Economic Activities

For this dissertation, I have estimated that the community's population was about 3,500 residents in 1996. Table 4.1 provides census data from a variety of sources. Other population surveys have estimated the population to be about 3,000 residents. I use a higher figure for several reasons. Civil authorities who conducted the local census in 1994 said they had missed many houses in each barrio. In addition, the Drinking Water Committee listed 865 households with registered drinking water connections (tomas) in 1996, and each household had an average of four to five members. This would give a figure of almost 4,000 community residents. Also, given the steady population increases that I explain below, a figure of 3,500 residents seems like a reasonable estimate of the population during 1996.

Archival evidence suggests that la Purificación's population was about 500 to 750 people for most of this century and up to about 1970 (see Chapter 5). The population increased to about 1,000 people by 1970, but a steady out-migration and little in-migration curbed the population growth. After 1970, La Purificación's population rapidly grew to about 3,500 people (INEGI 1991). This accelerated population increase after decades of little population increase parallels reports for foothill and sierra communities in Northern Acolhuacan (see Aldana Martínez 1994; Palerm Viqueira 1993; Pérez de Olmo n.d.; Pérez Lizaur 1973).

Table 4.1 Census Data

Source and Year	Residents	Households
1. National Census (1990)	2,691	--
2. The 1990 Report (1990)		
Total	2,846	615
Regular Residents	2,390 (84%)	500
Occasional Residents[a]	456 (16%)	85
Under Construction	n/a	30
3. Local Census (1994)		
Total	3,198	800
Barrio de Sta. Teresa Norte	688	168
Barrio de Sta. Teresa Sur	750	211
Ampliación Sta. Teresa (colonia)	585	130
Barrio de la Concepción Norte	535	131
Barrio de la Concepción Sur[b]	640	160
4. My Estimate (1996)	3,500	865[c]

Sources: 1.) INEGI (1991); 2.) CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México (1990); 3.) ADM, Local Census, conducted by Delegación Municipal, La Purificación Tepetitla, Municipio de Texcoco, Estado de México (1994-1996); My estimate based on participant observation and analysis of census data (1996).

[a] Defined as people who reside in the community during weekends and vacations.

[b] The data were not complete for Barrio de la Concepción Sur, and were estimated with an average of 640 found for the other barrios.

[c] From the Account Books of the Drinking Water Committee.

For the rest of this section, I draw extensively on an unpublished 1990 report of a survey conducted by students from Colegio de Posgraduados in Montecillo.[9] I refer to this as "the 1990 report." The 1990 report summarizes data from a survey of 487 households in La Purificación. Where possible, I supplement the 1990 report from other sources, including my own observations.

The 1990 report suggests that the population had doubled from about 1,200 inhabitants in 1980 to about 2,400 inhabitants in 1990. The population increase is due mainly to a decreasing out-migration and a steady in-migration. The population increase represents an average 5% annual increase each year, or about 25 new families each year, or 120 new inhabitants. The 1990 report lists 16% of the population as "occasional residents" because they usually reside in the community only during weekends and vacations. The addition of occasional residents provides a population increase of about 29 new families or 142 inhabitants each year. Based on my observations, some of these occasional residents were wealthier people who resided permanently in Texcoco, Chiconcuac, or Mexico City, and referred to the house in the in La Purificación as a second "country house" (casa de campo). Other occasional residents considered themselves natives of the community who had migrated to work

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[9] CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

and live in a city, but maintained or inherited a house in the community.

Table 4.2 indicates that less than half of the residents (43%) were born in La Purificación, and 57% were born in other locations. The majority (82.8%) of the residents were born in the State of Mexico and Mexico City (i.e., the Valley of Mexico). In most cases, residents born in foreign countries work as professionals in nearby agricultural schools.

In Table 4.3, data from the national census (INEGI 1991) lists the educational attainment of residents who were at least 15 years of age. Most (90%) had some formal education. Over half (55%) had schooling beyond the six years of primary school and would have included people with the equivalent of bachelors, masters, and doctoral degrees (some from U.S institutions, including Michigan State University).

Table 4.4 shows information on the materials used in housing construction. Most houses (about 80%) were built with cement floors, cement block or brick walls, and cement slab or poured cement roofs. A group of houses (about 20%) had dirt floors, adobe walls, and roofs made of corrugated metal, and, based on my observations, usually corresponded to households of lower socioeconomic strata.

Table 4.5 shows information about drinking water and sanitation. Most households (80%) reported having drinking water, which probably meant they had a registered household

Table 4.2 Birthplace of Residents

Place	Percent
La Purificación	43.0%
Mexico City	17.0%
Texcoco	16.4%
State of Mexico	6.4%
Central Mexico	6.4%
Northern Mexico	5.8%
Southern Mexico	2.7%
Foreign Countries[a]	2.4%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

[a] Listed as countries outside of Mexico in North America and Latin America, Europe, Australia, Asia, and Africa.

Table 4.3 Educational Attainment of Residents

Level of Education	Persons
No formal education	137
Some primary education (less than six years)	351
Primary education (six years)	416
Beyond primary education	776
Total	1,410

Source: INEGI 1991.

Table 4.4 Housing Materials

Materials	Households (%)
Floor	
Cement	82.5%
Other	17.5%
Walls	
Cement blocks or bricks	75.6%
Adobe bricks	21.6%
Roof	
Cement slabs (losa de concreto)	44.4%
Poured Cement (bóveda)	23.3%
Corrugated Composite Material (lamina de asbesto)	19.0%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

Table 4.5 Drinking Water and Sanitation

Facilities	Households (%)
Drinking Water System	
With Drinking Connection	80%
Without Drinking Water Connection	20%
Water Storage	
With a Cistern[a]	22%
Without a Cistern	78%
Sewage Disposal	
Septic Tank	64.7%
Latrine	9.8%
Without Sewage Disposal[b]	25.5%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

[a] A cistern is a large, covered, underground reservoir.

[b] This includes households who drain wastewater into streets, irrigation canals, and gardens.

connection (toma) to the network of water pipes. A minority of households (20%), however, had a cistern for storing drinking water. A cistern is a large, covered, underground reservoir, made of cement and brick, and capable of storing large quantities of water (1,000 to 3,000 or more liters). Some cisterns may originally have been built to store rainwater and irrigation water, but, in practice, most are used to store drinking water. Many households have piletas, which are aboveground cement or brick basins to store moderate amounts of water (200-500 liters) for cooking, washing dishes, and laundry. People often fill metal drums (tambos) of 200 liters of water for use in bathrooms and washing dishes. Rooftop water reservoirs of plastic and fiberglass (200-500 liters) allow households to store water for later use when it can be pulled by gravity into the house for use in kitchen and bathroom sinks, showers, and toilets. These reservoirs have largely replaced jagüeyes, a round, uncovered reservoir (several meters in diameter), dug in the ground, lined with stones, and connected to a canal to fill it with surface water for domestic purposes (see Chapter 5). Some households fill jagüeyes with water from the piped drinking water system, and others have converted jagüeyes into septic tanks. Most households used septic tanks and latrines to dispose of human waste.

The 1990 report says that 100 households reported that they did not have a registered household connection to the drinking water system, the majority of which were located in

Barrio de la Concepción Norte. The 1990 report indicates that a majority of survey respondents rated their household drinking water service as "fair," "bad," or "very bad," and identified it as the service that was in need of most attention. The 1990 report recommends that drinking water service should be extended to other households and that the community should work on a better schedule for delivering drinking water. The 1990 report indicates that a majority of survey respondents identified sewage as the second service that was in need of attention. In addition, most respondents rated the system of faenas (corvee labor and a major way of improving services) as "good" (50.6%) and "average" (25.4%), but many (17.6%) said they "did not know." For the purposes of this dissertation, I use the term faena in a general sense to refer to corvee labor; that is, unpaid community labor, which community authorities usually require of residents in lieu of or in addition to taxes for public works projects (e.g., drinking water projects, road repair).[10] This involves general faenas that involve labor from one representative of each household in the community for projects that benefit all residents

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[10] Ethnographic literature in the region characterizes faena as obligatory, unpaid communal labor done for public works projects for the benefit of the community (see Gómez Sahagún 1992:97; Rodríguez Rojo 1995:37-38; Wolf and Palerm 1955:267). Studies in other areas of Mexico and other Latin American countries describe corvee labor (called faena or tequio labor) as obligatory, unpaid community labor or communal labor in relation to irrigation systems and other public works projects (see Guillet 1992:195-196; Stephen 1991:232; Warman 1980:307; Wittfogel 1957:68-70).

(e.g., drinking water projects); and it involves faenas that require the labor from one representative of each household that benefits from a more specific project (e.g., irrigation, ejido, and schools).

In general terms, the 1990 report says that the majority of respondents identified irrigation water (agua rodada) as the most important natural resource in the community. The majority of respondents also said they were most worried about conserving and increasing the portion of community land with trees. The 1990 report says that 50% of the respondents said they collected wild plants, principally for medicinal use and cooking.

The following paragraphs summarize the broad economic activities of community residents. Table 4.6 lists people's use of land, water, and other resources for agricultural production. Residents with ejido plots generally have irrigation water and huertas in the community. Families with animals for household consumption raise primarily poultry (56%) and pigs (29%). I also observed families raising other animals (e.g., rabbit, sheep, cattle) for consumption. Some people raised cattle and horses for agricultural labor, and some raised horses for recreation.

This information illustrates that small-scale agricultural production was a noticeable but limited activity in La Purificación, and, according to my observation, was practiced almost exclusively by established residents. Established residents make up almost half of the

Table 4.6 Agricultural Characteristics

Characteristic	Households (%)
Possess ejido plot	17.0%
Possess irrigation water rights	38.6%
Cultivate garden or orchard (huerta)	33.6%
Grow vegetables for household consumption	16.0%
Raise animals for household consumption	27.0%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

population, but less than half of the households of established residents have ejido land and about two-thirds of established residents have irrigation water and huertas. In general, wealthier new residents do not possess agricultural resources, but people living on larger properties have obtained access to irrigation water for maintaining ornamental gardens and lawns.

Table 4.7 lists forms of employment and shows the reliance on nonagricultural employment. The 1990 report classifies 33% of all residents as being employed, and, in 1990, this group had an average weekly salary of $258 pesos[11] (three times the official minimum wage). Similarly, INEGI (1991) estimates that 29.8% of the residents were employed in 1990. The 1990 report says that, on average, each household had one to two employed members who provided at least 50% of the household's cash income. Only 9% of respondents were employed in agriculture (many of them most likely to work for greenhouse owners), even though almost a third of the households had irrigation water and huertas. In other words, people had access to agricultural resources for household consumption, but they did not report it as a source of employment.

Table 4.8 shows that a minority (23%) of employed residents worked in the community, and the rest work outside, primarily in Texcoco and Mexico City. This

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[11] In 1990, the exchange rate was roughly $1.00 U.S. dollar = $3.00 Mexican pesos.

Table 4.7 Principal forms of Employment

Employment	Percent
Public employment	25%
Commercial Activities	16%
Worker	10%
Bricklayer (albañil)	10%
Agriculture	9%
Other	30%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

Table 4.8 Place of Employment

Place	Percent
La Purificación	23%
Texcoco	59%
Mexico City	9%
State of Mexico and neighboring states	9%

Source: CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

illustrates that people have ties to urban centers in the Valley of Mexico. Based on my observation, most of these workers commuted to work daily.

The 1990 report concludes that, based on the indicators listed above, the community had a high level of "well-being" (bienestar) compared to other communities in the Municipio of Texcoco.

Socioeconomic Stratification

For my analysis in subsequent chapters, I classify the population into a hierarchy of four socioeconomic strata: upper, upper-middle, lower-middle, and lower. Each stratum represents a group of households that broadly shares a range of economic and social characteristics. I classify 15% of the population in the upper stratum, another 15% of the population in the lower stratum, and the rest of the population into two middle strata each representing 35% of the population. The four strata represent broad, emergent, and shifting trends in the community, and many characteristics cut across several strata.

The strata are local class-based groups that are influenced by a household's access to the means of production, that is, its access to land, water, capital, technology, and labor that allow household members to make a living. In this sense, the strata are related to larger national patterns of socioeconomic differentiation in Mexico. My description, however, goes beyond simply

differentiating owners of the means of production (i.e., capitalists) from those who make a living primarily by selling their labor (i.e., the working class). Viqueira Landa (1992) observes that research in Northern Acolhuacan has revealed the persistence of a small-scale agricultural (campesino or peasant) sector in many communities, which gives households access to productive resources to make a living by means other than strictly wage labor. This "incomplete proletarianization" (Aldana Martínez 1994; see also Palerm Viqueira 1993) mediates class differentiation and has allowed households to occupy various intermediate social positions between capitalists and wage laborers. This relates to research on the complexity of socioeconomic stratification in Mexico, and research that relates socioeconomic stratification to local histories of peasant formation, ethnic and gender identities, ritual practices, and other local, regional, and national processes (de la Peña 1981; Menéndez 1981; Palerm 1989; Stephen 1991; Warman 1980; Wolf 1959). According to Roseberry (1989), class-based groups in Mexico are defined and redefined in relation to each other in the context of ongoing material social processes.

I focus my description of the four socioeconomic strata on economic factors related to occupation, income, and wealth. I also examine possession of local land and water resources that allow households to engage in subsistence and commercial agriculture. In addition, I characterize each

stratum in terms of several secondary factors, including education, consumption patterns, and housing construction. The stratification reflects ongoing socioeconomic changes that, in the last few decades, have resulted in the entrance of new residents with relatively high incomes and wealth (i.e., professionals, commercialists) and the emergence and expansion of opportunities for established residents to receive higher incomes from commercial activities, salaried work, and wage work. While people sell their labor in newly created wage jobs, they continue to make a living by relying on some small-scale agricultural production.

The community has little permanent presence of Mexico's wealthiest capitalist class who control industrial, financial, bureaucratic, and commercial institutions in the region and are likely to live in Texcoco, Chiconcuac, or Mexico City. Similarly, general economic and social indicators suggest that the population does not have a substantial segment representing Mexico's poorest households. Thus, when residents in the La Purificación differentiate between rich and poor households, it is in relative terms. The wealth differences are not as substantial as might be the case in other areas of Mexico, and there is considerable overlap among households in each stratum. Some residents in all the strata refer to themselves as "campesinos" and "poor," but they may be relatively well off compared to people living in poor urban

neighborhoods, squatter settlements, and smaller rural communities in the Valley of Mexico.

I. Upper Stratum

The upper 15% of the community's population is engaged in a variety of professional and commercial activities. Many work as managers, professors, and researchers for corporate, educational, and bureaucratic institutions, and others own land and water resources for commercial agricultural production. A professional segment roughly corresponds to what residents refer to as "professionals" (profesionales), and a commercial segment roughly corresponds to what residents refer to as "merchants" or "business people" (comerciantes). Community residents often refer to the wealthiest households as "rich" (rico) because of their high level of consumption.

The upper stratum includes a segment of residents who work (usually outside the community) as professionals: professors, researchers, bureaucrats, technicians, engineers, lawyers, politicians, office managers, health professionals, and small business owners. In local terms, the professional segment receives relatively high salaries. Most have received postsecondary education, most are Mexican born, and some are descendants of established families. A noticeable group of households have members employed in the region's baccalaureate and postbaccalaureate educational institutions and other government-run institutions (e.g.,

Universidad Autónoma de Chapingo, Colegio de Posgraduados, and Centro Internacional del Mejoramiento del Maíz y Trigo -- CIMMYT). These professionals have postsecondary and postbaccalaureate training, some with doctoral degrees from universities in the U.S., Canada, and Europe. Many are new residents, and a few immigrated from other countries and have become Mexican citizens.

Few households of the professional segment rely on agricultural production and they do not own or possess local private huerta land, ejido plots, or irrigation water. In recent years, some members of this group have purchased land that included a right to a small share (one hour or so every few weeks) of irrigation water, which is used to maintain ornamental gardens and lawns. They often hire other residents of lower strata to work as gardeners, domestic workers, day laborers, bricklayers (albañiles) and construction workers. They usually own their own houses, one or more cars, and perhaps a truck. A few professionals temporarily rent houses, and others occasionally live in La Purificación in their second house, which they call a "country house" (casa de campo), used primarily on weekends and vacations. Most residents of the professional segment purchased land for permanent housing, and built new, large, single-family two-story houses of bricks and cement blocks within the community nucleus. Their properties are moderate to large (750-3,000 square meters). Their houses follow urban models, and are enclosed by tall stone walls (bardas)

with inner courtyards. They usually have rooftop tanks and large cisterns for storing drinking water, and they have septic tanks for wastewater. Inside, they usually have flush toilets and showers, and sometimes they have washing machines. Most have telephones and a few have satellite television antennas. A few households were built with a swimming pool, but, during my field research, the pools remained empty of water.

The upper stratum also includes a commercial segment, which is composed mostly of households whose members are involved in commercial activities, usually involving small-scale commercial agriculture and small businesses. As I note in the next chapter, the commercial segment includes a group of locally prominent and powerful families who controlled many community affairs, particularly from the 1940s to the 1970s. After that, a new group of families obtained wealth in new commercial activities and challenged the power of the prominent families. During my fieldwork, many of the households of the commercial segment were engaged in intensive use of irrigated huerta land and greenhouses for commercial production of ornamental flowers and medicinal plants to sell in urban markets where some own small shops and market stalls. They often have ejido plots, engage in limited subsistence agricultural production, and raise livestock.

This group's high economic position rests partly on its ownership of local businesses and possession of local land

and water rights, although the household may have only a few hectares of irrigated land that is intensely cultivated. In other words, they are not among the region's largest landowners, but, locally, they have more land than most other community residents. They also possess a major share of the rights to irrigation water and are active in managing the irrigation system. They employ other residents of lower strata to work for wages in commercial greenhouse production and as day laborers. Some households have also invested in transportation companies that lease small buses for local transport and operate larger buses for long distance transport of people and goods to urban centers and for tourism.

Most members of the commercial segment claim ties to the community as established residents, live within the community nucleus, and identify with a local campesino lifestyle. Their houses may be larger than those of lower strata, and consist of older family homes made of adobe bricks on large plots of agricultural land (3,000 square meters or more) in the community nucleus. Most homes include newer additions and second stories made of newer materials. Others live in newly built homes on property that they inherited from their parents. In contrast to the professional segment, houses often include multiple families of several generations living together. A few have enclosed their property with stone fences, but most property boundaries are marked by plants (e.g., maguey), stones,

paths, roads, and irrigation canals. Many have rooftop tanks and cisterns for storing drinking water, and, if they own greenhouses, they usually have cisterns for storing irrigation water. They also have septic tanks, but many drain gray wastewater onto their properties. They usually have telephones, and they invariably own cars and trucks, which are used for personal and commercial transport. Most tend to have at least a primary and some secondary education, and some households have adult children who have postsecondary education.

II. Upper-Middle Stratum

I refer to the next 35% of the population as the upper-middle stratum, which consists of a group of households that rely on income from salaries or wages and have some wealth in terms of ownership of houses, land, and water rights, but are not as well off as those of the upper stratum. Households are more likely than the upper stratum to identify themselves as campesinos and refer to their campesino background in earlier generations. Most work outside of the community in industrial, government, and service sectors. There is a wide range of occupations, which usually involve skilled work or secondary and postsecondary education. Occupations include: primary and secondary school teachers, factory workers, corrections officers, clerical workers, electricians, plumbers, lower-level managers, and mechanics. A sizeable group has jobs at

the nearby Texcoco prison, and others work at the nearby educational institutions. This stratum also includes many of the owners of small grocery shops and other small businesses in the community.

This group is most visible within the community nucleus, but a few have moved to the colonia and ejido. Many households consist of established residents who inherited land and water resources from their families and may rely on those resources to supplement their salaries and wage incomes. Usually, households consist of three or four generations of multiple families with some members engaged in wage labor and others working in subsistence agriculture and temporary wage labor. Many have relatively large private properties (3,000 or more square meters). Many families have adult children who inherited parts of the family's agricultural property and built houses for residential use. Their property boundaries are marked by plants, stones, paths, and roads. Some have sold smaller plots of land (about 250-750 square meters) to newcomers, and some have built houses to rent to temporary employees of educational institutions. Some have begun dividing up ejido plots and allowed adult children to build houses on the plots. Many households have a car or truck, although many people rely on public transportation to commute to work.

Other households in this stratum include those with little possession of resources for agricultural production. This includes households composed of new residents without

previous ties to the community who live by salaries and wages. Other households include descendants of established residents who did not inherent ejido land and irrigated huerta land. In previous decades, such people without resources for agricultural production would have migrated to find wage work, but in recent decades they have inherited or purchased small plots (500-750 square meters) of the family's agricultural land, converted it into land for residential use, and built their own houses. Some may have small gardens and raise poultry and pigs for household consumption.

A portion of the households may have cisterns and use other reservoirs (e.g., barrels, piletas, rooftop tanks) to store drinking water. Many have indoor plumbing and septic tanks, but they are likely to wash laundry outside. They usually drain gray water into a septic tank or onto the property. Some households have cars or trucks and rely on public transportation. Many have telephones.

III. Lower-Middle Stratum

I refer to the next 35% of the population as the lower-middle stratum. This stratum is part of a continuum with the upper-middle stratum and represents a tendency for a greater portion of households in the community to rely more on wages and less on agricultural production. They have little access to capital, including technology, for commercial agriculture. They may have limited access to

land and water rights, but may supplement household income with a limited amount of subsistence agriculture. They are likely to refer to themselves as "poor" (pobre). Households rely on the wage income of at least one member who works outside of the community in similar kinds of occupations listed for the upper-middle stratum. Households in this stratum, however, tend to have more members who work locally in lower-paying, less skilled jobs for wages. Occupations for this stratum tend to include: gardeners, day laborers (jornaleros), bricklayers (albañiles) and construction workers, security workers, domestic workers, factory workers, corrections officers, shop clerks, truck drivers, carpenters, janitors, cafeteria workers, restaurant workers, photographers, and musicians. Many work in nearby communities, and some weave and sew in their homes for regional merchants.

If they own or possess ejido plots, huerta land, and small shares of irrigation water, they do not invest in these resources for commercial use and most cannot produce enough food (e.g., corn) to last through the year. Some families, from time to time, sell portions of their maize harvest from their ejido plots and flowers, fruit, and nopales from huertas to local businesses for sale in markets and restaurants. They often raise poultry, pigs, and sheep for household consumption, for roadside food stands, and for selling to local restaurants and other households who purchase food for large fiestas. They are also more likely

than upper strata to have members who engage in limited craft production and sell food at roadside stands.

Most families in this stratum have modest, one-story houses, usually constructed with newer materials such as cement blocks and cement floors, and they usually do not have a large wall surrounding the property. The property is usually moderate to small in size (250-750 square meters) and may be bounded by the walls of their house and a small courtyard. Their houses often have additional rooms that are in the process of construction. Some households have older houses made of adobe with additional rooms made of newer materials. Such houses may have a central kitchen and bathroom and have separate living areas for each married couple and their children.

In general, households do not have cisterns and usually rely on other reservoirs (e.g., barrels, piletas, rooftop tanks) to store drinking water. Many have indoor plumbing and septic tanks, but they are also more likely than upper strata to have latrines and they usually drain gray water onto their properties or into the streets and irrigation canals. Few have cars or trucks and rely on public transportation, and they are not likely to have telephones.

IV. Lower Stratum

I refer to the bottom 15% of the population as the lower stratum, which represents the poorest stratum and consists mostly of people who are unemployed or who work

locally in the lowest paying, least skilled permanent and temporary wage jobs. Occupations include: gardeners, day laborers (jornaleros), bricklayers (albañiles) and construction workers, domestic workers, sewing shop workers, carpenters, janitors, and cooks. Some are temporary day laborers with variable schedules. For example, households of upper strata who are unable to send a household representative to complete faena labor may hire someone from the lower stratum to work as a day laborer several times a month at the faenas. Some people of the lower stratum are retired people, older, or widows living on pensions and relying on community support. Adults often have little more than some primary-school education.

Members of this group do not have access to agricultural land, ejido plots, or irrigation water, and consequently does not rely on agricultural production for a livelihood. If they do own land, it is often a small plot (250-500 square meters; in some cases, less) usually bounded by the walls of their housing compound. Some do not own land, but simply live in a room of an employer or rent a room. Older houses usually consist of adobe walls, earth floor, and roofs of corrugated metal, and have few glass windows. Newer homes are built with cement blocks walls, earth floors, and roofs of corrugated metal. People from this stratum live in the community nucleus and make up a sizeable portion of households in the colonia.

Few have cars or telephones. Some of the dwellings have multiple families. They may raise poultry and pigs for household consumption and to sell at roadside food stands. They do not have cisterns, and may not have rooftop tanks for storing drinking water, relying instead on barrels, buckets, and wash tubs as water reservoirs. Many may not have official drinking water service, and they rely on unregistered hookups from family and neighbors living nearby. They are the least likely to have indoor plumbing and most use water outdoors for laundry and food preparation. They are also not likely to have flush toilets, and, of all the strata, households are the least likely to have a septic tank and drain gray wastewater and sewage into nearby streets, roadside ditches, and irrigation canals (in 1990, 25% of the households reported having neither a septic tank or latrine; see Table 4.5).

Residency Status

I use the concept residency status to classify the population into two main groups: established residents and new residents. In later chapters, I examine ways that residency status influences the formation and implementation of local drinking water policies. People claim a certain residency status as a way to assert and challenge authority regarding drinking water management. I use the terms "established" and "new" residents, which draws on Lamphere's (1992) use of the terms "established residents" and

"newcomers" in a study of immigration in the U.S. As Lamphere notes, such terms highlight the fact that people claiming to be "from here" and "natives" may themselves be descendants of people who migrated to the community in previous decades. In other cases, a new resident might claim an identity as an established resident by citing kinship ties with a parent or grandparent who had lived in the community but out-migrated decades earlier. Below, I summarize the broad social characteristics of each group, recognizing that there are a range of differences within each group.

The concept of "established residents" corresponds to local terms people use to indicate residents are "from here" (de aquí, del pueblo, and originario) and "natives" (nativos) of the community. Established residents are also more likely to refer to themselves as campesinos and rural people (gente del campo). The concept of "new residents" corresponds to terms people use to indicate that residents are "new people" (gente nueva), "not from here" (no de aquí), "outsiders" (de afuera), "foreigners" (extranjeros), "city people" (gente de la ciudad) and "nonnatives" (no nativos) of the community. In some cases, established residents might specifically refer to an individual or family by their foreign nationality, regional Mexican identity, or their ties to Mexico City. Such terms reflect the idea that residents use length of time of residence in

the community as well as birthplace and kinship as primary markers for residency status.

Established Residents

In broad terms, established residents (about half the population) have lived in the community for various generations, recognize extensive kinship and compadrazgo ties within the community, and are invariably Roman Catholic and participate in the local Roman Catholic church. Established residents are represented in all the socioeconomic strata listed above, but make up the majority of the commercial segment of the upper stratum, and make up much of the two middle strata. Established residents, almost exclusively, possess the ejido plots, rights to irrigation water, and huerta land. This illustrates that established residents have more ties to agricultural production than new residents and suggests why established residents often claim a campesino identity even if they rely little on agriculture.

As has been the case for most of this century, resources for agricultural production are limited. The amounts of ejido plots, huerta land, and surface water for irrigation were fixed, and those without access to such resources often migrated to look for wage work in the Valley of Mexico. After the 1970s, new employment opportunities emerged in the region with the introduction of wage jobs and improved infrastructure for commuting to those jobs. This

allowed a greater portion of the community's population to stay in the community, relying more on income from wage jobs and less on agricultural production. Some residents who worked in factories in the region invested money into transportation companies, small businesses, and greenhouses for small-scale commercial agriculture. However, as the information in sections above shows, a greater portion of residents born in La Purificación belong to households without access to ejido plots, huerta land, and surface water for irrigation. In cases where households of established residents do not directly possess agricultural resources, they have kinship ties with households that do have agricultural resources, and they may assist in cultivating and harvesting agricultural products. They are also more likely to occupy the highest cargos and supervise and attend faenas.

New Residents

Similarly, in the 1970s, new residents began moving to La Purificación, principally from Texcoco and Mexico City. For my analysis, I distinguish between new residents with ties to the community and new residents without previous ties.

New residents with ties to the community include descendants of people of earlier generations who migrated out of the community (often to Mexico City) and people who married an established resident and moved to the community.

Others may have inherited a house and land from a more distant relative, friend, or compadre. Others may have had some long-standing business ties to the community. Most are Roman Catholic, and may, before moving there, have regularly visited the community and participated in annual religious festivals organized by the locally-elected religious authorities. They are more likely than other new residents to claim that they are "from here" and accept cargo service, participate in faenas, and adhere to local customary laws regarding drinking water management.

New residents without previous ties to the community consist of people in all of the socioeconomic strata. They include two noticeable groups: the professionals of the upper stratum who live in the community nucleus and many of the residents of the lower stratum who live in the colonia. The group of new residents without previous ties to the community has little or no access to irrigation water and huerta land and no access to ejido land for agricultural production. New residents have few local kinship ties. Most are Roman Catholic, but some do not participate in church activities and others attend Roman Catholic churches outside of the community (e.g., in Texcoco). As outsiders, their residency status gives them less authority and they are less likely to be elected to cargo offices. They are also less likely to understand or participate in faenas.

Birthplace is the primary way that residents categorize people as being "natives" (established residents) or

"nonnatives" (new residents) of La Purificación, but the categorization is complicated. People born in La Purificación officially claim themselves as natives of the community, but so do some residents born outside of the community who have kinship ties to people living in the community. Descendants of natives claim themselves as natives, even if they were born in Mexico City at a time when their parents temporarily resided there. In turn, established residents may differentiate themselves from "nonnatives" who were born in the community as first-generation descendants of parents not born in the community. In later chapters, I elaborate on how people use birthplace, kinship, land ownership, and fulfillment of customary obligations to claim a residency status as native or nonnative in negotiations concerning drinking water policies.

The entrance of new residents has been a large factor in the population increases in the last few decades, and has influenced drinking water issues. The 1990 report described above suggests that expected population increases will increase the demand for community services, particularly for better drinking water service and a public sewage system, and that the in-migrants were requesting such services more than was the established residents.[12] The 1990 report

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[12] CAP, unpublished report, Diagnóstico Integral, Microregional de la Comunidad "La Purificación", Municipio de Texcoco, Estado de México, by students from Colegio de Posgraduados, Texcoco, Estado de México, 1990.

notes that in-migrants were less likely than established residents to know about the system of faenas and often expressed opposition to local customs. The 1990 report recommends that "given the imminent population increase, this situation should provoke analysis and reflection to be able to reconcile both interests in search of a collective benefit." The notion of "both interests" refers to the opposing views between established residents and new residents.

Political and Religious Organization

This section outlines the community's political and religious organization and shows ties to regional and national politics. The local political and religious organization consists of a series of civil and religious offices, which anthropologists conducting research in indigenous and mestizo Mesoamerican communities have described as a civil-religious hierarchy of cargos (Brandes 1981; Cancian 1965, 1967, 1990; Carrasco 1961, 1990; Chance 1990; Chance and Taylor 1985; de la Peña 1981; DeWalt 1975; Dow 1977; Foster 1967; Greenberg 1995; Mathews 1985; Nash 1970; Rus and Wasserstrom 1980; Stephen 1990, 1991; Stephen and Dow 1990; Warman 1980; Wolf 1957, 1959, 1966). In La Purificación, the local political and religious organization incorporates principles described for indigenous and mestizo

communities in Northern Acolhuacan. Researchers of communities in Northern Acolhuacan note that most civil posts reflect national laws about municipal and ejido organization (Gómez Sahagún 1992; Palerm Viqueira 1993), but religious cargos and some civil cargos follow local customary organization. It is a hierarchical organization in that a few people occupy cargos at the top of the hierarchy and have the most responsibility and authority. A larger number of residents occupy cargos at the bottom of the hierarchy and, consequently, have less responsibility and authority.

Table 4.9 lists the names of each cargo and the number of people in each cargo. People who occupy these cargos, especially the highest positions, are the community authorities. Chapter 6, "Leveling the Water," provides more detail about the cargos, including who tends to occupy which posts, how elections are held, and matters related to the management of water resources. Table 4.10 lists the major annual festivals sponsored by religious authorities, and Table 4.11 lists the major annual festivals sponsored by civil authorities. The most important cargos (principally in the delegación, the ejido, and mayordomías) are considered obligatory, in that the person, once called upon, is expected to serve the term of the office. Other cargos (education associations and others) are voluntary, and people do not risk being penalized for declining to serve. All cargos are unpaid positions, and require people to

Table 4.9 Civil and Religious Offices

	Offices	Number
Civil Offices		
1. Delegación Municipal	Delegados	3
	Consejo de Participación Ciudadana	6[a]
	Comité de Agua Rodada	6[a]
	Comité de Agua Potable	7[a]
	Guardia Social	40
	Comité Auxiliar del Consejo de Participación Ciudadana (la colonia)	3
	Guardia Social (la colonia)	10
2. Ejido	Comisariado Ejidal	6[a]
	Consejo de Vigilancia	6[a]
3. Asociaciones de Padres de Familia	Kindergarten	6[a]
	Elementary School	6[a]
	Secondary School	6[a]
Religious Offices		
1. Mayordomía del Pueblo	Fiscal or Fiscala	1 or 2
	Mayordomo or Mayordoma	19
2. Mayordomia del Culto	Fiscal or Fiscala	1 or 2
	Mayordomo or Mayordoma	19

source:

[a] Headed by 3 main officers (president, secretary, and treasurer), and the rest are auxiliary officers.

Table 4.10 Festivals Sponsored by Mayordomos

Date	Festival
January 6	Three Kings Day
January 24-February 1	Novenario (9 days of rosaries and processions)
February 2-6	Fiesta of la Virgen de la Candelaria
March	Palm Sunday, Holy Week, and and Easter (variable dates)
June	Corpus Cristi (variable dates)
July	Santo Jubileo (variable dates)
October 15	Fiesta of Santa Teresa
November 1-2	Day of the Dead Ceremonies
December 8	Fiesta of la Virgen de la Concepción
December 12	Fiesta of la Virgen de Guadalupe
December 24-25	Christmas and Posadas
December 31	New Year

Table 4.11 Festivals Sponsored by Civil Officers

Date	Festival	Main Sponsor
March	Carnival (variable dates)	Other Committee[a]
May 3	Holy Cross Day	Ejido
May 10	Mother's Day	Delegación and Education Committees
May 15	Fiesta of San Isidro	Ejido
July	Graduations	Education Committees
September	Fiesta of the Holy Cross	Other Committee
September 15	Independence Day	Delegación and Ejido
November 20	Revolution Day	Delegación and Ejido

[a] Other local groups sponsor festivals that are not part of the obligatory duties of elected cargo officials.

coordinate their public service with other activities related to making a living. In most cases, the office holder maintains his or her regular job, but may change his or her work schedule to fulfill cargo duties. Some households have multiple members engaged in fulfilling cargo duties of the elected office holder, and other households pay a nonhousehold member to fulfill an elected cargo officer's duties.

The community authorities coordinate activities among the cargos so that each cargo potentially can influence drinking water management. The elected, unpaid civil posts are rotated every three years among all households in the community nucleus, and the elected, unpaid religious posts are rotated every year among all households in the community nucleus. In general terms, the civil posts are held by males, and the highest posts in each committee are held by established residents from the upper stratum and the two middle strata who usually have both irrigation water and ejido land. Smaller posts ("cargos chicos") are held by new residents and women, and include bottom posts in the delegación, the guardia (civil patrol), and education committees. Every citizen is obligated to fulfill service if elected to a cargo or risk having community authorities impose a sanction on them, which can include cutting off the person's drinking water.

Delegación Municipal

Direct management of drinking water is incorporated into the body of civil authorities called the Delegación Municipal, or, more commonly, "the delegación." Three elected officials called delegados head the delegación. The term "delegado" directly translates as "delegate" or "representative" of the community. The delegados oversee the three administrative committees listed below, and they work closely with the presidents of each committee to make decisions about general community issues. Delegados also oversee guardia service, which refers to the work that each adult male between the ages of 18 and 60 is supposed to complete one day per month. Males are supposed to report to the delegados and request to fulfill some sort of work, such as cleaning the building, working on public works projects, or other odd tasks. The person may also pay $10 pesos each month instead of completing the service. Students are exempt from fulfilling guardia duty. A six-member Consejo de Participación Ciudadana (Citizen Participation Council) consists of a president, secretary, treasurer, and three auxiliary members called vocales. A seven-member Comité de Agua Potable (Drinking Water Committee) consists of a president, secretary, treasurer, and four auxiliary members called fontaneros (which translates as "plumbers" and refers to their work in opening and closing valves in the water system; see Chapter 6 on a description of their duties). A six-member Comité de Agua Rodada (Irrigation Committee)

consists of a president, secretary, treasurer, and three auxiliary members called vocales or aguadores (which translates as "water deliverer" who actually distributes irrigation water; see Chapter 5 on a description of their duties). Delegación authorities work closely with other local representatives in lower level posts. Delegación authorities supervise a 40-member civil patrol and a separate set of auxiliary representatives for the colonia. Delegación authorities also hire other workers. A paid secretary answers telephone calls, types and files documents, manages payments, sends notices, and manages the office. A man is paid to clean the office and perform general tasks such as delivering notices, helping to register properties, and assisting in emergencies such as repairing broken water pipes.

The three delegados and the three committee presidents are the highest local authorities and occupy the most important posts in the community. Officially, the community delegación is part of the Municipio of Texcoco. For example, official documents identify the community as "La Purificación Tepetitla, Texcoco." In addition, the three delegados and the three top officers of the Citizen Participation Committee are sworn in at the Municipio of Texcoco in the offices of the Municipal President (Presidente Municipal), and they receive identification badges and official seals from the municipio. This gives them added authority as representatives of the municipio,

and signatures and seals of some or all of these representatives are required for drinking water projects, including official requests for construction materials and technical assistance from municipio, state, and federal programs. Although the drinking water committee directly oversees drinking water issues, many other officers make decisions in the officers' council meetings (cabildos), and often other officers' signatures are required for drinking water projects. The drinking water and irrigation committees are independent of the municipio and in some ways subordinate to the delegados and municipio authority. On the other hand, authorities also suggested that this independence is a form of autonomy from municipio control. In later chapters, I explore ways that local drinking water management is relatively autonomous from broader political control.

Civil authorities regularly deal with municipio, state, and federal officials to obtain funds and technical assistance for local drinking water projects and other public works projects concerning irrigation, roads, and schools. Civil elections do not involve political parties, but obtaining government funds implies supporting Mexico's national ruling political party, the PRI (Partido Revolucionario Institutional). During my fieldwork, most civil authorities expressed support for the PRI, but some authorities told me that groups of households supported the PRD (Partido de la Revolución Democrática), the main rival

of the PRI in the region. Former civil officials organized PRI-sponsored events. In addition, most municipio offices were run by members of the PRI.

Some of the interaction with the PRI came in the form of participation in the Mexican government's National Solidarity Program (PRONASOL, Programa Nacional de Solidaridad), which was created in the 1980s during the PRI administration of President Salinas de Gotari. Dresser (1991:1) refers to PRONASOL as "an umbrella organization aimed at developing health, education, nutrition, housing, employment, infrastructure, and other productive projects to benefit the seventeen million Mexicans living in extreme poverty" (see also Cornelius, Craig, and Fox 1994). Dresser notes that the Solidarity program has been part of PRI efforts to gain political support for its political and economic reforms, and is "strengthening the party . . . by providing renewed sources of patronage" (1991:2). In Chapter 5, I note how officials in La Purificación used the Solidarity funds to improve part of the drinking water system.

During my fieldwork, however, there was competition between the PRI and the recently formed political party called the PRD. Most elected posts have long been filled by the PRI in the Municipio of Texcoco, but the PRD has begun winning elections for a few posts in the municipio. Some of these posts have authority over allocating funds for public works projects, including drinking water projects. In later

chapters, I touch on some of the emerging tensions regarding the PRI and the PRD in the Texcoco region. Civil officials in La Purificación took into account these tensions when they requested support for drinking water projects, but there was little evidence that such tensions played a major role in local drinking water issues. There was little evidence of influence by other political parties in the region, such as the PAN (Partido de Acción Nacional).

Ejido Offices

The delegación also works with the 12 representatives of the Comisariado Ejidal. Men usually occupy the offices, but some women have served as officers. Officers hold the position for three years, during which time they are exempt from being elected to offices in the delegación and the mayordomías. Officers meet on Saturdays to coordinate faenas to organize ejido projects and meetings of all of the ejidatarios. According to some officers, it is not a "heavy" (pesado) or burdensome cargo like the cargos of the delegación because the ejido has little infrastructure and little agricultural equipment to manage.

The ejido authorities are part of a federal system of ejidos. They interact with federal authorities from the office of Procuraduría de la Reforma Agraria and participate in programs such as PROCEDE (Programa de Certificación de Derechos Ejidales y Titulación de Solares Urbanos; Program for Certifying Ejido Rights and for Granting Titles to

Settled Plots of Land). Ejido authorities also had links with national organizations, such as the CNC (Confederación Nacional Campesina), a government-sponsored peasant union.

Education Associations

There are also educational committees for the kindergarten, the six-year primary school, and the three-year secondary school. Each school has an Asociación de Padres de Familia (Parents' Association). All parents of children attending a school belong to the school's association, but the association elects officers. Most people involved in these cargos are women. They are elected for one year, and, unlike other cargo officers, people are not exempt from serving in the civil cargos listed above and the mayordomías listed below. Someone with a cargo in the delegación, church, or ejido may decline to be named to a cargo in the school because of their responsibilities. However, some people with cargos in the school accept and serve in other cargos. Education associations organize fiestas, organize faenas, coordinate policy with the directors and teachers, and set and charge fees for parents. They may also coordinate activities with local civil officials and petition for government funds to improve school facilities.

Mayordomías

Each year, 40 individuals are also chosen to fulfill obligatory service in the mayordomías to organize and sponsor annual festivals for the local Roman Catholic church. People are elected to one-year positions in the mayordomía. Two groups of 20 men and women are named as mayordomos. One or two people head each group and have a cargo called fiscal (male) or fiscala (female). The fiscal or fiscala keeps account of the money collected to sponsor fiestas and coordinates work obligations of the other officers, who are called mayordomos (males) and mayordomas (females). Most people of all socioeconomic strata are elected to serve a half mayordomía (media mayordomía). Those from the upper stratum, especially if they have extensive land and water holdings or other forms of wealth, are assigned a full mayordomía (mayordomía completa). The mayordomos have regular meetings to vote on how much each mayordomo has to contribute to the group's general funds to sponsor fiestas.

One group, la Mayordomía del Pueblo, is charged with organizing the large fiesta for the patron virgin of the community, Palm Sunday and Holy Week activities, and the fiesta for the chapel of Santa Teresa (Oct. 15). The other group, la Mayordomía del Culto, organizes activities for the rest of the year including the other major festival of Corpus Cristi, the fiesta of Santo Jubileo, and the fiesta for the chapel of La Concepción (Dec. 8). The two groups

have the option of working together for each fiesta, but there is often some separate coordination. They usually work together for festivities related to Christmas, the Fiesta de la Cruz, and some other church activities. Each year, there is debate and some tension within and between groups about how they will manage the festivals.

Mayordomos coordinate some activities with civil officials, principally with delegación authorities. For instance, civil and religious officials meet and develop written agreements about how much to charge a person who does not want to work in the mayordomía but is willing to pay cash to sponsor fiestas. Civil and religious officials also meet to discuss the appropriate ways to impose sanctions on people who do not accept mayordomías or who do not fulfill their religious cargo service. Religious officers also plan fiesta activities in coordination with the delegación, and the delegación requests that the guardia social watch over religious processions and dances in the plaza during fiestas. Civil authorities also give festival organizers permission to hold certain events on community property.

The religious cargos, unlike most civil cargos, have few ties to outside officials. The mayordomías are local groups that coordinate their elections and most duties independent of the local priest or other church officials in the Diocese of Texcoco. They work with the local priest to organize the priest's duties (e.g., to say mass at

festivals). Religious officers also pay a sacristan who cleans the church buildings daily, rings the bell for religious activities, and assists the priest in religious functions. The fiscales, however, possess the keys to church property and open and close the church for religious functions.

Other Cargos

There are a series of smaller offices (cargitos) that people participate in each year. Some of this service counts as fulfilling obligatory guardia duty and includes participation in the marching band, a folkloric dance group, a decoration committee responsible for decorating the main portal for the two major church fiestas, and a committee for organizing Independence day festivities. People do not receive such credit for participating in other smaller cargos, such as committee work on a small civil or religious project. In the church, mayordomos invite people to sponsor rosaries during the months of May and June and to sponsor parts of the Christmas celebration. The church has a number of voluntary associations that sponsor different masses and small fiestas.

People also participate in government-sponsored rural development programs, such as Vivienda Rural (Rural Housing), Juventud Rural (Rural Youth), and Mujeres en Solidaridad (Women in Solidarity; part of PRONASOL). When people work on a local committee related to a program, they

refer to their position as a cargo. Fulfillment of these cargos is voluntary, but it reinforces the notion that one is participating in the community.

Summary

This chapter shows that living in La Purificación is influenced by a mixture of various social features: indigenous and mestizo roots; agricultural production and wage labor; wealthy and poor households; civil and religious authorities; and established residents and new residents. In particular, this chapter shows that La Purificación has features associated with rural communities (e.g., subsistence agriculture, mayordomías) as well as features associated with urban middle-class and working-class populations (a high number of households in professional, commercial, and wage labor activities). To some minds, it may appear that the community is moving away from its campesino past even as it holds onto the image of itself as a rural paradise. However, La Purificación parallels other communities in the region that evidence the coexistence of capitalist and noncapitalist ways of making a living and organizing local lives. There is a tendency toward greater socioeconomic stratification, but this is moderated by local factors related to residency status, ritual participation, and local political organization. Numerous households in La Purificación rely on income from wage labor while at the same time they invest in agricultural production and

maintain an irrigation system and ejido plots. Many residents also value and confer status on people with ties to agriculture, as evidenced by the tendency to elect people with ties to agriculture to higher civil and religious posts. These sorts of features shape drinking water management and allow households to gain access to drinking water.

Chapter 5

LABORING FOR WATER

In this chapter, I examine the historical background of contemporary drinking water politics in La Purificación. I focus on how people have drawn on a history of surface water management to deal with political aspects of securing access to and control over underground water for household consumption. Residents in La Purificación have a long history of using various customary ways of securing adequate amounts of surface water for agricultural production and household consumption. I examine events in the 20th century when La Purificación defended its claims to surface water against competing groups in the region. In the decades following the Mexican Revolution, local residents used the cargo system as a form of local organizational power and they used state assistance for campesino agricultural development as a limited form of structural power. In later decades, the community deployed these modes of power and installed a drinking water system using underground sources. As occurred with irrigation management, people claim authority over drinking water management based on kinship,

length of residence in the community, and personal history of contributing to community affairs. Similarly, authorities attempt to manage drinking water as a community-held resource, access to which requires users to fulfill communal labor obligations or risk having authorities impose sanctions on them. In particular, this process has involved established residents with ties to agriculture using the cargo system to deal with conflicts with competing groups within and outside the community.

In my analysis of the history of laboring for water, I wish to avoid portraying La Purificación as a completely unified entity, even though residents appear unified in their collective efforts to secure water for "the community" as a community. Laboring for water may have motivated community residents to recognize common interests, form alliances, and contend with outside interests and claims. However, organizing a large water project has included dealing with the ongoing internal disputes and conflicts among people who often disagree even though they live in the same physical location. Creating a local water authority has involved applying sanctions to residents who do not fulfill community labor obligations and who do not abide by customary water management laws. This process has also included attempts to deter large inequalities in water distribution related to local social and economic differences. The next chapter examines in more detail the

process of providing fair supplies of water and dealing with internal conflicts.

Prerevolutionary Background of Water Control

Water control has long been a central facet of people's lives in La Purificación and other Northern Acolhuacan communities. People have worked for centuries to transport water from sierra springs into the small valley where La Purificación is located. In this section, I briefly examine major prerevolutionary (i.e., before 1910) patterns of water control in La Purificación.

As I note in an earlier chapter, it seems that in the 17th century a group of indigenous people moved out of the plains zone and settled in the foothills. This settlement would have relied on canals that supplied mountain spring water for irrigation and domestic use. In the 18th century, residents in La Purificación fought to maintain rights to a portion (one surco) of this surface water. A document from 1757 shows that the local colonial administrator (juez alcalde), representing the residents of La Purificación, petitioned the Spanish Viceroy for continued rights to this water, claiming that it was especially needed for irrigation.[13] The document argues that the water was needed for the "conservation and perpetuation" of the "Indians (Indios) of the pueblo La Purificación and its

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[13] ADM and AHA, Aguas Superficiales. Título de agua de la Purificación, 1757. Exp. 12,766.

barrio San Miguel," and that it was primarily for irrigating gardens (huertas)[14] so residents could harvest fruit. The document mentions that the population consisted of 187 tributaries (excluding some residents because of "age, sickness or privilege").

Against the wishes of neighboring indigenous communities and large landholders, La Purificación and San Miguel Tlaixpan received a portion (one surco) of water from the river, Río del Molino, as it was called then.[15] A census taken a few years later lists only one Spaniard living in the community, who was probably the juez alcalde appointed by colonial authorities to look over matters in La Purificación and its barrios. The rest of the population would have been considered indigenous, and Spanish authorities officially referred to the population as "Indians" (Indios).[16]

After Mexico gained its independence from Spain in the 19th century, La Purificación (similar to other foothill communities) lost access to some portions of surface water, which was directed to the expanding haciendas and mills (see Aldana Martínez 1994; Pérez Lizaur 1973; Wolf and Palerm

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[14] Huerta translates as an irrigated garden or an orchard. Residents in La Purificación generally refer to these plots of lands as huerta with or without the presence of fruit trees. People use the world terreno for plots of land for field crops such as maize.

[15] Colonial documents refer to people living in indigenous communities as "Indians" (Indios).

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1955). In addition, San Miguel Tlaixpan, previously classified as a barrio of La Purificación during the era of Spanish colonialism, grew in size and became an autonomous community. Beginning in the 1830s, San Miguel Tlaixpan made claims on almost half of La Purificación's allotment of water.[17] San Miguel Tlaixpan agreed to allow the water to pass through its territory before reaching La Purificación as long as San Miguel Tlaixpan could receive part of the water. The agreement called for a rotating schedule of water delivery during the dry season, which allowed ten days of water for La Purificación and eight days of water for San Miguel Tlaixpan.

Despite competing claims on the water from haciendas and neighboring communities, La Purificación maintained its access to a portion of the surface water and used it for irrigation and domestic purposes. Residents remained concerned about securing more water and frequently requested support from the Municipio of Texcoco to construct a better dam and to deal with the water that ". . . the pueblo has had as property since the time of the [Spanish] Viceroys."[18] Oral history and local documents indicate that many families in La Purificación had members who worked on the haciendas and that some residents used their

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[17] ADM, Carta al Gobierno del Estado de México, Toluca, 30 de diciembre de 1918.

[18] ADM, Acta del Juzgado Auxiliar de la Purificación, mandada a Texcoco, 27 de noviembre de 1911.

irrigated plots to cultivate crops for subsistence and for sale (e.g., fruit, flowers, and medicinal plants) in urban markets. Local authorities managed water for irrigation and for domestic use. Community residents received water if they contributed water fees as well as fulfilled labor requirements for faenas and cargos.

Postrevolutionary Control over Surface Water

The Mexican Revolution began in 1910, and marked a new phase in La Purificación's system of water control. The early period of the revolution represented a chaotic time for the community. Oral accounts stress that the community was dispersed because of battles fought in the region. Local documents suggest that the community endured problems with hunger due to drought and the destruction of the dam by a lightening bolt in 1913. Community residents remarked to an official from the federal Secretaría de Agricultura y Fomento (SAF) that many of the community's 300 laborers (hombres de trabajo) were obligated to migrate to Mexico City to look for work and that, by 1923, there were only about 80 to 100 agricultural laborers (braceros) remaining in the community of less than 500 inhabitants. Residents' principal means of livelihood depended on harvesting fruit (from orchards, e.g., membrillo, avocado, pear, tejocote), wheat, and many varieties of flowers and selling them the

next day in markets in Mexico City.[19] The official estimated that the community consisted of about 250 hectares of land, that it was not the best quality land for agricultural production, and that community residents could irrigate about half the lands if they received government assistance in obtaining adequate supplies of surface water and building a dam.

Petitioning for Surface Water

Mexico's 1917 Constitution includes Article 27 that guarantees rights to land and water for campesino agricultural production. In December 1917, shortly after the passage of the constitution, residents in La Purificación began a lengthy and difficult process of petitioning the state and federal agencies to reclaim the community's right to its portion of the surface water from sierra springs.

At first, La Purificación proposed to reclaim their full one surco of water, ending the agreement to divide the water with San Miguel Tlaixpan. Community officials, however, later proposed to take water that went to the large landholders, particularly to the haciendas del Batán, Santo Tomás, Solache, and Chapingo in the plains below. This effort included mobilizing financial and political support

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[19] ADM, Informe de Secretaría de Agricultura y Fomento, 13 de noviembre de 1923, y la carta de Ildefonso Velázquez al Gobernador del Estado de México, 27 de agosto de 1919.

from relatives who had migrated to Mexico City, especially a group of entrepreneurs who owned a bakery called Panadería de los Gallos. Former community residents in Mexico City helped people traveling from La Purificación by giving them places to stay and by assisting with negotiations with government officials, lawyers, and engineers. In 1920, the community entered into an agreement with a Sr. Ildefonso Velázquez, a former community resident and a wealthy businessman living in Mexico City.[20] Sr. Velázquez agreed to cover expenses for handling legal matters (e.g., typing papers, filing petitions) with government authorities, and the community agreed that residents would pay contributions to cover other major expenses. The community also agreed that, upon receiving more water, they would build a better aqueduct and dam, and develop a set of regulations to prevent misuse of water and prevent a few people from obtaining exclusive control over part or all of the water.

The community first turned to authorities from the State of México to request expanded water rights. In a letter to the Governor of the State of Mexico, officials from La Purificación explained the community's problems, including: limited water supplies; the need to build new canals and dams; the constant vigilance needed to prevent other communities from stealing water; and the misuses of water by downstream communities and haciendas who wasted

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[20] ADM, Acta de la Purificación 15 de diciembre de 1920.

extra, unused portions of surface water by allowing it to drain into Lake Texcoco.[21] The document refers to the water as "drinking water" (agua potable), perhaps because it was clean spring water that was drinkable, and perhaps to differentiate it from other forms of water (rainwater, lake water, wastewater). Residents requested justice from the governor, explaining their need for water:

> In the dry season [September to May], if we irrigate our gardens (huertas), there is not enough water to store for later use. Hence, if we try to irrigate our lands in March and April, and sometimes into May when there is an extended dry season, with great hardship we are scarcely able to irrigate a few plots, because this precious liquid does not last.

Similarly, in a letter in February 1918, La Purificación argued for "justice" in order to "alleviate our public and private necessities, which we complain about year after year; because water is the soul of a pueblo."[22] This and other letters explain the problems residents had living in a remote corner of the foothills, farming rocky and sandy soils, and depending on unpredictable rains to cultivate food crops (principally maize) and some commercial crops. In good years, the soil was productive, but in many years, if the rain arrived late, people harvested little more than maize stalks (zacate) regularly used as animal feed. Having

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[21] ADM. Carta al Gobierno del Estado de México, Toluca, 30 de diciembre de 1918.

[22] ADM, Carta al Gobierno del Estado de México, Toluca, 15 de febrero de 1917.

irrigation water would allow them to plant maize in March and April (the dry season) and have a more secure harvest each year.

Many documents mention that the community needed the water for both agricultural production and household consumption. Officials argue in the documents that the current allocation was barely enough to irrigate four or five properties and fill a few reservoirs for household use.[23] Letters explain the community "suffers great damages" to wheat crops without adequate irrigation water in the fall.[24] In 1918 the governor of the State of Mexico granted la Purificación its request for one surco of water, taking into consideration the chronic water scarcity, the size of the population, the agricultural use of land, and the fact that other communities had sufficient quantities of sierra spring water.[25] San Miguel Tlaixpan, however, contested the ruling, and the allocation of water remained in contention for several years.

Eventually, in the 1920s, La Purificación petitioned at the federal level with the Secretaría de Agricultura y Fomento (SAF) for its share of this "precious liquid," "the

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[23] ADM, Carta al Gobierno del Estado de México, Toluca, 10 de marzo 1918.

[24] ADM, Carta de Ildefonso Velázquez al Gobernador del Estado de México, 27 de agosto de 1919.

[25] ADM, Carta del Gobierno del Estado de México, Toluca, 24 de julio de 1918.

soul of a pueblo."[26] In 1922, Sr. José J. Reynoso, an engineer in Mexico City working on behalf of La Purificación, petitioned federal authorities for a portion of the river water (6.5 liters per second) for "irrigation and domestic use."[27] Documents state that the community needed to irrigate about 250 hectares of private land located in the community nucleus. In 1923, Sr. Reynoso complained to government officials that the community had been petitioning for the water since 1917 and that officials should have kept in mind the "shortages of water the residents suffer each year during the dry season."[28] The surface water flowed from mountain springs and into a river called (before the revolution) Río del Molino, taking its name from the Hacienda Molino de Flores through which the river flowed. After the revolution, the hacienda lost much of its control over the water, and the name of the river was changed to the Río Coxcacuaco. La Purificación made its claims to federal authorities for water as an individual community, and, again, the claim was challenged by neighboring foothill communities (primarily San Miguel

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[26] ADM, Reglamento de la Dirección de Aguas de esta Secretaría de Agricultura y Fomento, México DF, 21 de septiembre de 1923.

[27] ADM, Carta de la Secretaría de Agricultura y Fomento, México DF, 18 de noviembre de 1922.

[28] ADM, Carta de Ing. José J. Reynoso, a la Secretaría de Agricultura y Fomento, México DF, 22 de septiembre de 1923.

Tlaixpan) and haciendas (Molino de Flores and el Rancho del Batán).

Joining an Irrigation Council

On September 2, 1924, La Purificación received a title signed by Mexico's President Alvaro Obregón conceding rights to a portion of the water from Río Coxcacuaco for irrigating land in the community.[29] The water was granted primarily for irrigation, but a small portion was also granted for "public and domestic uses" (usos públicos y domésticos).[30] At the same time, the federal authorities organized all of the users of the water that came from a set of sierra springs called San Francisco, located above the sierra community San Jerónimo Amanalco. The water flows from the springs, down a natural course, until it is physically separated into two large water flows at El Partidor San Francisco. The water then flows into two large aqueducts and is used by two irrigation councils called Junta del Río Papalotla (or Hueyapan) and Junta de Aguas del Río Coxcacuaco. Later, La Purificación was assigned to the Junta de Aguas del Río Coxcacuaco, an irrigation council (junta) that originally consisted of 12 communities and haciendas stretching from the sierra springs of San

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[29] ADM, Libro de las aguas.

[30] ADM, Reglamento, la Secretaría de Agricultura y Fomento, y la Dirección de Aguas, Tierras, y Colonización, México, DF, 21 de diciembre de 1925.

Francisco to Lake Texcoco (see Gómez Sahagún 1992; Lane Rodríguez 1994; Rodríguez Rojo 1995). By 1928, in accordance with the Agrarian Reform of the Mexican Revolution, the state officially granted La Purificación rights to the surface water as part of the new irrigation council. Thus, it took years of negotiations and state intervention to resolve the competing claims to water resources in the region.

The creation of this irrigation council, however, was associated with a new set of disputes among the communities. For example, residents of San Jerónimo Amanalco, the sierra community near the mountain springs, prevented federal officials and representatives from La Purificación and San Miguel Tlaixpan from surveying the area to build a canal to channel water to the foothill zone.[31] After leaving San Jerónimo Amanalco, a portion of the water travels in a canal that distributes 20 liters per second of water to La Purificación and 32 liters per second of water to San Miguel Tlaixpan. Sharing this canal has generated periodic conflicts when one community has charged the other with stealing its water.[32] Over the years, La Purificación has had to request outside government intervention to deal with upstream communities stealing water from canals, arguing

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[31] ADM, Carta a la Secretaría de Agricultura y Fomento, México, DF, 13 de marzo de 1928.

[32] ADM, carta del padrón de los propietarios, 19 de octubre de 1922.

that La Purificación was left "without enough water even for the most urgent necessities, that is, without water for domestic use or for the animals that work campesino lands."[33] Local archives are full of documents related to problems involved in managing water for the group of communities in the irrigation council. The major problems included: not fulfilling obligations to the council (e.g., paying fees, fulfilling labor service), misusing water, and stealing water.

During this time, and up to the 1970s, the community represented itself as an agricultural campesino community. For decades, the population consisted of about 500 to 750 residents who engaged in a combination of subsistence and small-scale commercial agriculture and some wage work. In the 1920s (following population declines related to the Revolution and the Spanish Influenza), the community registered 88 residents owning 92 pieces of property requiring irrigation.[34] In a document from 1938, residents refer themselves as "small agriculturalists" (pequeños campesinos), cultivating fruit trees, and living in poor economic conditions.[35] The document protests the increased fees the community was required to pay as part of the

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[33] ADM, carta a SRH, 7 de abril de 1922.

[34] ADM, carta del padrón de los propietarios, 19 de octubre de 1922.

[35] ADM, carta del los representates a la Secretaría de Agricultura y Fomento, 12 de septiembre de 1938.

irrigation council. Worried about water debts, community authorities pleaded to the federal government to not cut off the surface water:

> . . . without taking into account that we are usufructuaries since time immemorial; and even though we recognize that the river in question is national property, the Secretary should equally consider that the products of national waters are not for the benefit of the nation itself, but rather for the usufructuaries who have been benefitting from the water since the time of their ancestors, not just because of the legal arrangements, but also because the natural course that the waters travel, given the formation of the river, the communities, and [agricultural] lands. This is always for the benefit of the small agriculturalists (campesinos pequeños) who have been receiving the water for their own benefit, and not because representatives in charge distribute the water for more or less profitable commercial activities.

The community recognized that the state has authority over water, but, as campesinos, they "live from the labor that they personally do with their lands" and needed the water to continue making a living.[36] They based their claims to water on economic necessity, subsistence requirements, kinship ties, history of possession of the resource, and the natural flow of water through their property.

Although the community quickly claimed rights to irrigation water, it was less forceful in claiming its right to expropriate agricultural land from the haciendas. In 1918, in letters petitioning for water, residents briefly mention their interest in receiving land guaranteed by

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[36] Ibid.

Article 27 of Mexico's new constitution.[37] Community residents, however, waited for several years after receiving irrigation water to petition the federal agrarian reform programs to expropriate land from large landowners. In 1929, the government granted La Purificación expropriated land for an ejido in the plains zone. Oral history indicates that it took a few more years for community members to overcome initial apprehension of occupying the hacienda's land. The community gained the ejido land, but the land did not include corresponding water rights, which was a situation that occurred in other parts of Mexico (see Enge and Whiteford 1989).

Thus, by the 1950s, federal agrarian reform programs allowed campesinos in La Purificación to expand their access to land and water in a manner that is a distinguishing feature of foothill communities in the region. The community obtained rights to surface water from the sierra zone for irrigating privately-owned plots in the community nucleus in the foothill zone. Later, the community obtained access to ejido land (cooperative agricultural land) in the plains zone, but this did not include corresponding water rights (to either surface water or groundwater). This pattern of expanded access to land and water allowed the community to form an ejido and increase subsistence agricultural production of rain-fed crops such as maize,

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[37] ADM, Carta al Gobierno del Estado de México, Toluca, 15 de febrero de 1917.

squash, and beans. It also freed up irrigated land for increased commercial production of ornamental flowers, fruit trees, and medicinal plants and herbs.

Socioeconomic Stratification

From the 1930s to the 1970s, community residents used ejido plots and irrigation water to intensify small-scale agricultural production. According to oral history and archival data, there were relatively few economic differences among the households, and most people thought of themselves as campesinos. Most households made a living by a combination of small-scale agriculture and limited wage labor. Most households owned similar amounts of huerta land and possessed ejido plots and rights to irrigation water. Information suggests, however, that the community was stratified in to three broad groups: a small upper stratum of locally prominent and powerful families engaged particularly in small-scale commercial agriculture; a large middle stratum engaged in subsistence agriculture and some commercial agriculture; and small lower stratum with less resources for agricultural production who relied more heavily on wage work as day laborers (jornaleros). Those without access to resources for agricultural production tended to migrate out of the community in search of wage work.

After the revolution, the upper stratum of prominent families (who, in local terms were wealthy) dominated

community politics by occupying major cargos, and making decisions regarding faenas, cargo service, fiestas, and irrigation control. Oral accounts describe this group of households as having the most power and being the local bosses (jefes and caciques) of the community. Their local power rested on their hold on local organizational power as well as their commercial and social ties within the region. The group consisted of households who had the largest holdings of irrigated lands, engaged in small-scale commercial agriculture, and owned small businesses in the area. Many of the households in the stratum appear to have had kinship ties with each other and, in several cases, consisted of new male residents who married local women (established residents). The new male residents, some of whom were foreign entrepreneurs, had cash from other businesses and invested in property left by people who had fled during the revolutionary unrest. The prominent families also owned and controlled the only transportation company owning buses for moving people and agricultural products to markets in Texcoco and other areas. They would not allow competitors to use the main road to the south (toward Molino de Flores), so, according to many people, the community was left with unreliable transportation of poor quality. Below, I elaborate on conflicts over water management related to this socioeconomic stratification.

Cargos and Surface Water

Authorities in the cargo system controlled the intracommunity allocation of the surface water for both irrigation and household use. Community residents could claim rights to surface water, but this obligated them to provide civil and religious cargo and faena labor. For an annual religious fiesta cycle, office holders were selected for one-year terms from married men who used surface water for irrigation (and thus benefitted from faenas to keep water canals operative). The cargo system consisted of a few higher positions of authority and a larger number of lower positions involving labor for community projects.

Residents who used more irrigation water were named to higher posts and held them more often than those who used less irrigation water. In oral accounts, residents suggested that members of the locally prominent families influenced the elections to fill cargos each term, and sometimes named people to a series of consecutive cargos rather than rotate the cargos among the entire community. Families of the upper stratum occupied the highest cargos, but they also obligated other families from lower socioeconomic strata to occupy cargos as delegados, irrigation officials, and ejido representatives. Residents suggested to me that sometimes naming somebody to consecutive cargos was done in a vindictive manner and was used by members of the prominent families to obligate households of the middle strata to redistribute their wealth

and labor. This was a complex process that requires further study, but it suggests that a set of locally wealthy and powerful families influenced the distribution of labor obligations and water resources in the community.

The practice of naming irrigation users to cargos also partly grew out of the notion that those with irrigation water benefitted from the labor of other residents who provided faena labor (e.g., to clean canals, build new canals, and repair the system), so that, to be fair, irrigation users provided benefits to the community. In fact, the head of each household was obligated once a week to clean sewage drains, water canals, and connections to drinking water reservoirs that ran in front of the household's property, or risk being fined by authorities.[38] People who held offices in the mayordomías were exempt from other forms of obligatory cooperative labor, and some community residents occupied voluntary mayordomía offices to avoid other labor obligations.

As noted for other communities in the region (González Rodrigo 1993; Palerm and Wolf 1972), eligible men who refused to fulfill community service obligations risked being denied access to irrigation water and domestic water. For example, a document in 1949 from a community assembly mentions the case of someone who received irrigation water but refused to fulfill service for each irrigated property.

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[38] ADM, Acta de la Purificación, 30 de enero de 1946.

The document states that the community agreed that "everyone who irrigates two gardens (huertas) or two [agricultural] properties (terrenos) has to provide service and fees for each orchard or property, and they should perform guardias and faenas and provide monetary contributions (limosnas) to the church in order to have irrigation water."[39] The same resolution calls for the formation of a commission to watch over the use of irrigation water and make sure that residents did not misuse the water for pastures and other lands that did not require irrigation. It also states that a person who irrigated more than one garden (huerta) did not have the right to irrigate land to cultivate maize.

Intercommunity Contestations

After joining the regional irrigation council, La Purificación remained vigilant in receiving its share of surface water. For example, the community resisted attempts by the municipio to transfer river water to plains communities (e.g., Magdalena Panoaya), arguing that communities at lower elevations could easily drill for groundwater, something that La Purificación could not do because it was located at a higher elevation.[40] At other times, the community had to justify to federal officials why

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[39] ADM, carta del Juzgado Auxiliar, 14 de octubre de 1949.

[40] ADM, Carta a la Comisión Local Agraria del Estado de Mexico, 6 de agosto de 1931.

it used a portion of the irrigation water for domestic use, something that agricultural development programs prohibited.[41] The community also sent letters to federal officials protesting whenever neighboring communities requested permission from the Secretaría de Recursos Hidráulicos to divert river water for drinking water systems (sistemas de agua potable). In a letter in 1960, local authorities argue that the community needed the water for both irrigation and domestic purposes.[42] The letter states that transferring part of their allocation of surface water would:

> . . . be the complete ruin of our communities that live by irrigated gardens (huertas), which furnish fruit, vegetables, and flowers for the consumption of inhabitants in Mexico City; this would make us physically migrate from our pueblos to work as day laborers (jornaleros) as we used to do long ago, losing our position of modest economic independence that we have obtained after many years of effort.

Los Purifiqueños were justifiably concerned. La Purificación witnessed neighboring communities in the plains zone lose water rights. Decades after receiving federal water grants, communities located in the plains zone lost rights to surface water when foothill and sierra communities successfully claimed rights to the water for their growing

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[41] ADM, Carta a la Unión Nacional Defensora del Ejido y la Pequeña Propiedad Agraria, 29 de octubre de 1951.

[42] ADM, Carta al Presidente de la República Mexicana, 15 de noviembre de 1960.

populations. The Secretaría de Recursos Hidráulicos (SRH) and other federal authorities in the 1960s gave communities in the plains zone permission to drill deep wells (pozos profundos) and tap deep underground aquifers in exchange for conceding rights to surface water to upstream communities.[43] Consequently, communities in the plains intensified their tapping of groundwater, something that was easier to do at lower elevations (Lane Rodríguez 1994).

La Purificación (similar to other foothill communities) has been caught in an intermediate position because it does not have readily available sources of surface water or underground water within the community nucleus. La Purificación holds onto its allotment of surface water with continuous surveillance of water delivery, coordinated management of the resource, and negotiation with their neighboring communities and government officials. Local documents are full of correspondence about water disputes officials from La Purificación have had with neighboring communities in the plains zone (Xocotlán, El Batán, Molino de Flores, San Simón, Santa Cruz de Arriba, and La Resurrección), the foothill zone (San Juan Tezontla, San Miguel Tlaixpan), and the sierra zone (e.g., San Jerónimo, Santa María Tecuanulco). As I point out below, the intercommunity conflicts were a factor in prompting La

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[43] ADM, Carta de La Purificación al Director General de Aprovechamientos de Aguas Federales, Secretaría de Recursos Hidráulicos, México, DF, 5 de enero de 1962.

Purificación to drill deep wells to tap groundwater sources and install a piped water system.

Intracommunity Allocation

Surface water for domestic use was managed by Water Authorities (Representantes de Aguas) as part of the irrigation system. A few households had separate wells that tapped small pools of groundwater trapped in pockets of volcanic rock. All households, however, depended on irrigation water as the major source of water for "private" use (i.e., "domestic" use).

The actual distribution of irrigation water was done by an official called, at that time, juez de agua or repartidor (later called the aguador).[44] According to oral history, irrigation water was distributed in a rotating fashion between Barrio de Santa Teresa and Barrio de La Concepción. For example, the juez de agua began distributing irrigation water to users in Barrio de Santa Teresa. The juez de agua opened irrigation gates and allowed the allotted portion of water to flow onto the user's property. Similar to what I observed during my fieldwork, water was measured in terms of

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[44] Ethnographic accounts use a variety of terms to refer to officials who are responsible for actually distributing irrigation water. Juez de agua translates literally as "water judge" and repartidor del agua, as "water deliverer" (see Guillet 1992; Mabry 1996). Aguador translates as "water deliverer," and some accounts translate the term as a "water guard" (e.g., Enge and Whiteford 1989:137). In other areas, people use the term water "mayor" (alcalde) (Gelles 1994).

hours, so that a user received one or more hours of water. After delivering the water, the juez de agua closed the gate and proceeded with the next irrigation users. After delivering water to irrigation users in Barrio de Santa Teresa, the juez de agua took a few days to fill each stone-lined water reservoir (jagüey) for storing water for domestic use in Barrio de Santa Teresa. After that, the juez de agua proceeded to deliver water to users in Barrio de La Concepción in a similar fashion.

Some households had their own reservoirs for storing water for domestic use, and others shared reservoirs with neighbors. Any resident could use a few public reservoirs, but users were also obligated to help clean and repair the reservoirs. Each household stored water in the household's reservoir for a month until the juez de agua filled the reservoir again. People used buckets to haul water from the reservoir to the house for drinking, bathing, cooking, and other household uses. People paid the aguador a fee separate from fees for irrigation water. The fees, however, were administered by irrigation authorities. This system linked water for domestic use with water for agricultural use, and the agricultural use entailed the fulfillment of community obligations mentioned above.

The notion that the management of surface water has been a central aspect of community life in La Purificación is reflected in commemorations of historical figures. For example, in 1924 in the offices of the civil authorities,

the community hung a large portrait of the engineer Sr. José J. Reynoso, and had a ceremony honoring him for "taking an active part in obtaining the water, which will give life to our pueblo."[45] Later, in the 1970s, irrigation officials honored three local residents who secured rights to the surface water by placing a monument consisting of a three-foot high statue of Christ at their graves in the community cemetery.

Control Over Groundwater

Since the 1960s, residents in the La Purificación have been involved in the ongoing process of developing a system for pumping groundwater from the plains zone up to higher elevations in the foothills. The process has drawn on the history of irrigation management, and it has incorporated new social and technological resources. The materials presented above show that the community has had a long-standing concern about securing adequate water for domestic use. According to oral history, residents' concerns about the dwindling and polluted supplies of surface water motivated efforts to tap groundwater sources for both irrigation and domestic purposes.

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[45] ADM, Acta de La Purificación, 19 de marzo de 1924.

Drilling a Well in the Community

Geological studies in the 1950s concluded that it was difficult to develop underground sources in the foothill valley where the community nucleus of La Purificación is located.[46] A geological report from the Secretaría de Recursos Hidráulicos (SRH) concluded that the foothill valley "is completely inadequate for the drilling of deep wells (pozos profundos) for irrigation or domestic supply."[47] A few shallow wells (10 to 25 meters deep) in the community tapped small pools of rainwater that flowed from higher elevations and became trapped among layers of volcanic rock. Residents also recall collecting water from two small springs (ojos or llaraderos) called Ameyaltitla and La Capilla, which were probably similar pools of trapped water that, by the 1980s, had ceased providing water. The report suggested that it would be difficult to drill through the nearly impenetrable layer of volcanic rock, and that tapping abundant aquifers would require drilling deeper than 300 meters, too deep to pump water efficiently up to the surface.

In the 1960s, the community petitioned several government agencies for assistance in developing a piped

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[46] ADM, carta a la Confederación nacional de la pequeña propiedad agrícola, 3 de julio de 1950.

[47] AHA, consultivo técnico, estudio geohidrológico para el riego de los pueblos de Purificación, San Nicolás Tlaminca, y San Miguel Tlaixpan, Mpio. de Texcoco, Mex. SRH, abril de 1950.

drinking water system. One petition in 1965 asked for help from the Confederación Nacional Campesina (CNC) and involved a united effort by all of the community's representatives from the delegación and ejido.[48] Authorities asked the CNC to approach the Secretaría de Recursos Hidráulicos (SRH) about conducting another geological study to assess the possibility of drilling a well. The document points out that long ago La Purificación was granted surface water for irrigating gardens and for domestic uses, but "now it is barely enough for domestic service (servicio doméstico) even though it is a continuous and permanent flow of water. The scarcity of water has meant that irrigated fields have been turned into rain-fed fields."[49] The letter protests that neighboring communities had petitioned the Secretaría de Recursos Hidráulicos to obtain a portion of La Purificación's surface water, "which would greatly harm our dear pueblo."[50] Local authorities argue in the letter that La Purificación needed to protect its limited surface water for irrigation and drill its own deep well to tap groundwater sources for domestic purposes.[51]

In the 1960s, despite conclusions of the previous geological study, the community drilled its first drinking

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[48] ADM, carta a la Confederación Nacional Campesina, 6 de abril de 1965.

[49] Ibid.

[50] Ibid.

[51] Ibid.

water well in the community nucleus. Authorities obtained federal assistance from the Secretaría de Salubridad y Asistencia (SSA). The assistance was probably part of a public health initiatives to improve drinking water supplies in the region (Viqueira Landa 1994). This well was planned to provide underground water for the lower elevation (southern part) of Barrio de Santa Teresa. With SSA funds, the community built its first holding tank, pumped water up to the holding tank, and distributed water by gravity to public faucets and, after a few years, to individual households.

This water source, however, dwindled in a few years, and it became apparent to residents that it was not a steady supply of underground water from an aquifer, but simply limited pools of water. By the 1970s, the community requested permission and funds from the Secretaría de Salubridad y Asistencia (SSA) to relocate and register the malfunctioning drinking water well in the plains zone near communities that had tapped steady underground aquifers. Engineers suggested that it would be a costly but viable option to pump groundwater from the plains zone to the foothill settlement, something that would have been innovative at the time for any foothill community in the region. However, SSA and other health-related government programs denied La Purificación's request to develop a drinking water source at the lower elevation.

New Socioeconomic Differences

The 1960s and 1970s brought expanded opportunities for wage work for people living in communities in Northern Acolhuacan. Studies have described the growth in factories, construction, service industry and transportation, with most of the growth taking place in the plains zone (e.g., Aldana Martínez 1994; Pérez Lizaur 1973). There was also a decline in the profitability of agriculture, including a decline in markets for selling fruit from foothill communities. The region also benefitted from improved roads so that people could commute more easily to places of employment outside of the communities. This resulted in a greater rate of population growth because more people stayed to live and work in the region, and new people migrated to new jobs in the region (Pérez Lizaur 1973). Consequently, this increased the demand for water for domestic use.

An influx of cash and a growing importance placed on water for nonagricultural uses influenced La Purificación's development of a piped drinking water system. Families who obtained money from factory work used their new economic power to challenge existing practices in the community. In particular, a group of men in La Purificación became involved in wage work at nearby factories (e.g., Luxor) and in other regional transportation companies. This new group began to intensify commercial activities, including agricultural production in greenhouses. Commercialists and ejidatarios formed alliances and created a group that became

part of the upper stratum and upper-middle stratum that were emerging in the 1970s in the community.

Many of the new group of households were connected through kinship and challenged the power of the group I refer to as the prominent families of the upper stratum, which, for several decades up to that time, had dominated local politics. The new group of families organized a project to create a new road to connect the community to the Mexico-City-to-Veracruz highway and provide an alternative route for another transportation company (formed by some people within the group) to challenge the monopoly of the transportation company run by members of the prominent families. Community residents, especially those of the prominent families who had ties to the other transportation company, doubted that a road could be built down such a steep incline and criticized the use of community resources for the project. The project organizers, however, invested their own money to construct the new road.

At the same time, the group began occupying civil cargos, sold community land and ejido land for the settlement of the colonia, and used the money to pay for part of the road project. These local land sales were not legally permissible under federal laws governing ejido management, an issue that was not resolved until the late 1990s (see above, Chapter 4 on ejido lands).

The new road winds from the center of La Purificación down the face of a steep hill, through the colonia, across

the ejido, and out to the highway. The road provided the community with the possibility of more frequent and reliable transportation. By the late 1970s, the road became the community's first and only paved road, the main entrance displaying the arch that reads "Welcome to the Paradise of La Purificación."

Drilling the First Well in the Ejido

This new group organized the project to pipe underground water up from the ejido to the settlement. Some (but not all) members of the group possessed ejido plots and irrigated huerta land and engaged in agricultural production, but many also worked in newly created jobs in transportation, retail, and factory work, and some owned small businesses. Members of the group invested money in the water project, which was initially planned as a way both to expand commercial greenhouse production and improve drinking water supplies. Investment in greenhouses and huerta land increased and people cultivated and sold ornamental flowers (e.g., chrysanthemums) and medicinal plants in urban markets. These efforts depended on the better roads and transportation. The investment in greenhouses, however, depended on obtaining sufficient irrigation water. With support from this group, the community developed its strategy for water development and planned to drill an irrigation well in the ejido to pump water up to the community nucleus.

According to project organizers, developing this first well in the ejido was a major undertaking. They said that, once again, skeptical residents (especially the prominent families of the upper stratum) criticized the project and doubted that a system could be developed that would pump sufficient volumes of water up several hundred meters to the community. Some of the prominent families actively resisted participation in the project. Project leaders organized voluntary faenas and formed a new set of voluntary cargos, including a committee of ejidatarios. In 1975, the committee petitioned for and received credit from the Secretaría de Recursos Hidráulicos (SRH) to finance the project designed to "operate a deep well for agricultural purposes in the ejido land."[52] SRH also provided technical assistance to install a series of large water pipes (with diameters from 8 to 12 inches) to channel water from the well up to storage tanks, which would allow gravity to pull water down to the community.[53]

The Secretaría de Recursos Hidráulicos (SRH) indicated that it expected the community to administer the water by abiding by rural development program requirements and by forming an irrigation unit. The voluntary committee organized the group called la Unión de Ejidatarios de la

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[52] CAP, Carta de la Secretaría de Recursos Hidráulicos, 15 de diciembre de 1975.

[53] CAP, Carta de la Secretaría de Recursos Hidráulicos, 18 de mayo de 1976.

Purificación Tepetitla, and referred to it as an irrigation unit (unidad de riego). Officially, this was a local irrigation unit, independent of the multicommunity irrigation council for surface water. The group's executive committee worked with elected community representatives, but the committee initially oversaw major aspects of the project, including drilling the well, installing a pump and pipes, installing electricity to run the pump, and managing faenas. The group collected monetary contributions from irrigation users, but it also formed a Committee for Drinking Water (Comité Pro-Agua Potable) that collected contributions from residents who expected to use the water for domestic purposes.

The well began functioning in 1976 with a powerful water pump. An engineer from the State of Guanajato designed the water pump especially for the well. The engineer told organizers that they probably had the most powerful water pump in the Valley of Mexico in the early 1970s. Apparently, no other setting required such a forceful water pump, since communities at lower elevations easily pumped underground water to the surface, and communities at higher elevations used gravity to channel mountain spring water to their properties.

Up to the 1980s, the new system seemed to function well. Eventually, the community expanded the water network, connected more households to the system, and built two more large water tanks (depositos) to channel water by gravity to

Barrio de Santa Teresa Norte, to parts of Barrio de La Concepción, and to the newly established colonia. Community officials, however, told me that the drinking water well was run in a "semiclandestine" (semiclandestino) manner, because it was officially registered as an irrigation well with the federal government. Federal law stipulates that water is national property and requires all water users to register wells and water pumps (Leyes y códigos de México 1994b). In fact, during this same period, and up through the time of my fieldwork, the federal government had restricted the drilling of new deep wells (pozos profundos) from drinking water systems because of the falling water table (see Lane Rodríguez 1994). Local residents said that, because they could not obtain outside support to drill a deep well for a drinking water system, they turned to resources to develop an irrigation system. People involved in the early phases of the project said it was called an irrigation project, but most people assumed the project would also provide the community with a better drinking water supply. As I explain below, changes in water laws in the 1990s compelled authorities to abide by federal laws and register the well as a drinking water well.

Reorganizing the Cargos

After drilling the well, the community phased out the voluntary ejidatario water committee and incorporated drinking water management into the duties of elected civil

officials. At first, the delegados managed the drinking water account books, and then the Comité de Mejores (The Public Works Committee, a precursor to the current Citizens' Participation Council) briefly administered the drinking water system. The irrigation committee charged residents fees for using the water for irrigation. For over ten years, one man was appointed to manage the drinking water accounts. Then, by the mid-1980s, the community established a drinking water committee consisting of a separate set of elected civil officers under the authority of the delegados.

The drinking water committee has emerged as a central part of the delegación, resulting in the addition of seven new cargos to the civil-religious hierarchy. The committee has a desk in the delegación and handles its funds in a manner separate from other civil committees. Committee members help develop and enforce a broad spectrum of local polices regarding, for example, the ejido, irrigation management, road repair, and the local Roman Catholic church. Committee members also sign and put the committee's seal on delegación documents, many of which have little direct relation to drinking water. Drinking water officials also participate in community activities such as Independence Day and Revolutionary Day parades and school festivities.

The drinking water committee is a separate entity, but it is subsumed under the authority of the civil offices and the ejido. In interviews, authorities explained that the

underground water was originally a supplemental source of irrigation, and, for that reason, other authorities worked with the drinking water committee to manage the ongoing and contentious process of developing the community's drinking water supply. When the drinking water committee was instituted, the community's population included a large number of new residents who, along with some established residents, had few ties to agriculture. People with the most influence over drinking water management, however, have been established male residents with ties to agriculture, whether they are ejidatarios, owners of irrigated private land, or both. Most are from the commercial segment of the upper stratum and from the upper-middle stratum. In a sense, authorities who have been involved with drinking water management have tended to represent the interests of wealthier established residents who identify themselves as campesinos. In the next chapter, I explore how this power structure has, at times, mediated the influence of local social differentiation and outside interests on drinking water management, and has reinforced support for traditional authority and traditional management of community resources.

The community also reorganized the religious cargos and elected people who tended to be engaged in wage labor, both established residents and new residents. This extended responsibility for fiesta sponsorship from agriculturalists with irrigated land to others. The community abolished the voluntary mayordomias and required service in the two large

mayordomias for all property owners rather than simply for irrigation users. For annual elections, office holders are drawn from the list of male and female property owners (usually referred to as the "head" of the household). Most, if not all, property owners were also hooked up to the drinking water system. By the 1980s, new people began occupying religious cargos, including women elected as fiscalas and mayordomas, new residents, and members of households who do not use irrigation water. In addition, there are a few cases of non-Catholics being elected and serving as mayordomos. Refusal to accept a religious cargo has resulted in requests by religious authorities to have civil authorities shut off a household's drinking water, in addition to other penalties. The next chapter provides more details of the practices regarding the religious cargo system and the taxation of labor and money to receive community water resources for household consumption.

Drilling a Second Well in the Ejido

In the mid-1980s, the first well in the ejido began having problems. The aging pump began to wear out and break down. Further, the underground water table was falling, so the failing pump had to work harder to draw water to the surface. There was also more demand on the system because of the growing population of about 2,000 people, almost three times the population a decade or so earlier.

Organizers of the project had assumed that a new well would provide enough water to supplement surface water for irrigation and, at the same time, improve the community's drinking water supply. This is about the same time that authorities established the drinking water committee. A number of issues, however, emerged that led the community to pass resolutions that reserved groundwater for domestic purposes, and prohibited its use for irrigation, including greenhouse production.

Primarily, the well's mechanical problems led authorities to conclude that it was better to reserve the pump for delivering water for domestic purposes. Furthermore, authorities told me they were also concerned that officials in San Jerónimo Amanalco had been suggesting that La Purificación might no longer need its portion of surface water from the irrigation council because it had access to abundant groundwater for irrigation. La Purificación had seen neighboring communities in the plains and foothills lose rights to surface water for similar reasons. La Purificación was also beginning a project to install a large pipe to replace an open-air canal to transport surface water from the sierra zone to the foothill zone, and the project could have been endangered if government officials thought it was not necessary. As a result, the community officially designated underground water for drinking (agua potable) and surface water that ran in canals for irrigation (agua de riego or agua rodada), and

created two separate groups of representatives to manage the two water systems. In daily practice, however, residents continued to use water from both sources for irrigation and domestic purposes.

In 1985, the community spoke with engineers from the State of Guanajato about installing a new and more powerful water pump.[54] A new pump, however, would not resolve problems attributed to the location of the well. Geological studies suggested that the well be relocated a few hundred meters to a place better suited for tapping underground aquifers. As a result, officials petitioned for outside support to drill a deeper and wider well and to use a more powerful pump.

In 1988, the community reached an agreement with officials of the State of Mexico to drill a new drinking water well.[55] Documents about the agreement show that federal, state, municipio, and community authorities were involved in various facets of the project. Documents and information from residents show that officials from Mexico's ruling political party, the Partido Revolucionario Institucional (PRI), acted as intermediaries between the community and other government officials regarding petitions for construction materials and technical assistance. In

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[54] CAP, Carta, Industrias Medina, León, Guanajato, 10 de julio de 1986.

[55] CAP, Carta de las autoridades de la Purificación al Lic. Ignacio Pichardo Pegaza, Gobernador Constitutional del Estado de Mexico, 17 de marzo de 1990.

contrast to the first well in the ejido, documents portray the project as an explicit effort to use funds, technical expertise, and materials to improve the water system for domestic use. Documents from the State of Mexico assert that these efforts were part of Mexico's National Development Plan (1983-1988) and National Program for Urban Housing and Development (1984-1988), programs that identify the installation of community drinking water and sewage systems as high priorities for state and federal initiatives.[56] The State of Mexico expected La Purificación's representatives to include "community participation" (i.e., monetary contributions and physical labor) in the project. The State of Mexico's Comisión Estatal de Agua y Saneamiento (CEAS) and a state branch of the federal Secretaría de Desarrollo Urbano y Ecología (SEDUE) provided equipment and technical support, and the municipio and the community each agreed to pay half the cost of connecting electricity to the water pump.

An initial geological study by a federal agency in March 1988 suggested that the community, once again, should attempt to drill a drinking water well in the community nucleus.[57] A well in the foothill zone at the same elevation as the community nucleus would have provided a

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[56] CAP, Carta de acuerdo, SEDUE, 1 de junio de 1988.

[57] CAP, Carta de Dirección General de Infraestructura Urbana, y Subdirección de Apoyo a la Construcción de Fuentes de Abastecimiento, Departamento de Construcción, Ciudad de México, a 25 de Marzo de 1988.

more efficient and economical drinking water system. The community tried to drill a well in the community nucleus from July to December 1988, but these efforts failed to tap sufficient underground water supplies. The community decided once again to drill a well in the ejido and drilled from January to March 1989. A hydrological evaluation (aforo) in 1989 concluded that the new well had successfully tapped a steady and abundant supply of clean underground water close enough to the surface that it could be pumped to the community.[58]

After the well was drilled, however, community authorities wrote to state officials for several years before they obtained the balance of funds to complete the project. They reported difficulty, for example, in obtaining large pipes necessary to carry water from the well in the plains to the community nucleus in the foothills.[59] In 1990, drinking water officials wrote the Governor of the State of Mexico a few times to explain that they had finished the evaluation of the well on June 21, 1989, but they needed funds to register the new well, install a pump, and connect the electricity.[60] One letter states that

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[58] CAP, Carta de la Subdelegación de Vivienda, Desarrollo Urbano y Obras, Estado de Mexico, 30 de mayo de 1989.

[59] CAP, Cartas del Comité de Agua Potable, la Purificación, al CEAS, 4 de julio de 1989.

[60] CAP, Cartas del Comité de Agua Potable, la Purificación, al Lic. Ignacio Pichardo Pegaza, Gobernador Constitutional del Estado de Mexico, 17 de marzo de 1990 y 19

"this threatens the community with a water shortage in the next dry season, when the aquifer levels become considerably lower, and the well that currently supplies drinking water is in very bad condition."[61] The letters pointed out information indicating that the underground aquifers were falling, and that the only pump the community had to supply drinking water did not have the capacity to handle the demands of pumping water from greater depths. At the same time, a population approaching 3,000 people increased the demand for water. Mechanical problems with the well led authorities to increase water fees and reduce water delivery to each household to about four hours a day.

Local documents and oral history indicate that civil authorities and ejido authorities during several administrations united to obtain the necessary resources to complete the project. In the end, La Purificación received help from government agencies, including the Secretaría de Salubridad y Asistencia (SSA), the Comisión Estatal de Agua y Saneamiento (CEAS), and the Secretaría de Desarrollo Urbano y Ecología (SEDUE). The final phases of the project, including connecting the water pump to electricity, were supported by the Municipio of Texcoco with federal funds from the PRONASOL program. This new well was registered as a relocation of the previous well, which itself was

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de julio de 1990.

[61] Ibid.

registered as an irrigation well for agricultural purposes. Government authorities referred to the new well as a drinking water project, and, as a result, community officials had to notify the electric company that the well was for drinking water. This ended rural development subsidies the community received for irrigation and raised the cost of drinking water management.

By the time the 1994-1996 administration of civil authorities began, the second well in the ejido was ready to supply the population of about 3,500 people. The project had drilled a deep well to tap an aquifer a depth of 140 meters, which allowed the water to rise up the well to about 68 to 80 meters from the ground.[62] The community installed a powerful pump (250 horsepower) that easily channeled water through the system. The pump had been tested three times: 1) in 1993 when the governor of the State of Mexico inspected the project; 2) in 1993 during the fiesta of San Isidro, the ejidatarios' patron saint who is supposed to provide water for agriculturalists; and 3) on February 12, 1994, immediately after the outgoing civil administration transferred authority to the incoming administration.[63] In addition, in January 1994, the outgoing administration had reached an agreement with an ejidatario who conceded part of

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[62] CAP, Registro de Aforo, 4 de abril de 1993.

[63] CAP, Acta de Acuerdos de la primera extraordinaria Asamblea, 27 de Febrero de 1994.

his ejido plot to the community for use as a drinking water well. The ejidatario also agreed to guard the well. In return, the community donated construction materials to the ejidatario so that he could build a house near the well.

Soon after taking office on February 5, 1994, however, the incoming administration discovered that the pump had problems, apparently because sand had jammed the machinery. Officials were concerned that the pump had been seriously damaged and that perhaps the well had not been drilled properly. Community authorities held a special community assembly on February 27, 1994 to deal with the problem. The assembly approved a resolution that allowed drinking water officials to collect a one-time contribution of $110 pesos ($3 pesos = US$1.00) from each of the 605 households registered for drinking water connections. The community also increased monthly water fees from $10 pesos to $25 pesos, something that had failed to pass at an assembly during the previous year.[64] By March, the new pump broke down and the community turned to the old pump and the first well in the ejido for drinking water. Authorities limited the water delivery schedule until the pump was fixed. By 1995, at the beginning of my fieldwork, the community had fixed the pump and relied on the new well for drinking water.

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[64] ADM, Actas de Asamblea, 24 de enero de 1993.

Summary

This chapter illustrates the historical processes related to securing water for household consumption in La Purificación. Community residents have drawn on an extensive history of organized efforts to channel surface water and groundwater to a foothill setting that does not have its own water sources. Numerous documents bear the names and signatures of dozens of men and women who, over generations, have occupied unpaid elected cargos and worked to retain local control over scarce and contested water resources. This has involved the centralization of local authority to manage a communal resource. Residents, many of whom occupy lower socioeconomic positions within Mexican society, have provided physical labor, paid monetary contributions, fulfilled local obligations (faenas, guardias, fiestas), guarded water canals, confronted antagonistic outsiders, built alliances with sympathetic outsiders, and taken advantage of opportunities brought about by changes in regional relations regarding land, labor, and water.

Residents in La Purificación have directed their efforts at a number of environmental, technological, and social problems. Most importantly, in order to hold on to and expand their water rights, community residents have negotiated with other political actors, including neighboring communities, large landholders, engineers, lawyers, political party officials, and municipio, state,

and federal government officials. Particularly since the Mexican Revolution, residents have asserted their rights as campesinos and obtained surface water for irrigation and domestic use, ejido land that provided a suitable place for tapping underground water sources, and government funds targeted for irrigation and agricultural development. These efforts ended up allowing the community to develop groundwater resources for household consumption. Currently, the majority of the population relies more on salaries and wage income than on agricultural production, but a group of established residents continues to support campesino perspectives and practices regarding water management. In the 1990s, the community organized an explicit drinking water project and obtained support from government resources intended to provide healthier drinking water supplies to communities. This chapter examines how the community gained access to groundwater, and the next chapter explores how the community controls and distributes that water.

DRINKING WATER POLITICS IN RURAL MEXICO: NEGOTIATING POWER, JUSTICE, AND SOCIAL SUFFERING

VOLUME II

By

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Chapter 6

LEVELING THE WATER

The control of drinking water is replacing the control irrigation water as an important source of power, conflict, and cooperation in La Purificación. In this chapter, I examine local efforts to establish a set of drinking water rights and obligations that are "level" (parejo) and "fair" or "just" (justo). Local authorities uphold the view that drinking water (like irrigation water) is a locally-controlled communal resource to which one gains a "use right" (derecho) by fulfilling customary obligations (costumbres or obligaciones). Drinking water politics in La Purificación involves disagreement about what counts as fair, and I examine ways that groups struggle to impose their notions of a distribution of drinking water that is parejo (literally, "level"). I analyze how efforts at "leveling the water" influence the institutions, practices, policies, disputes, claims, interests, and meanings related to the community-controlled piped drinking water system. At the center of the politics is a struggle between groups who seek to continue managing drinking water as a communal

resource and other groups who challenge such an approach (particularly those who view drinking water as a commodified service).[65]

Competing Notions of Justice

The community has tended to elect local officials who have an interest in managing drinking water as a communal resource; that is, a resource that is shared among and management by members of the community. Local efforts focus on the goal of providing all community residents the use right to a just share of drinking water if they fulfill customary obligations. Here, the notion of a just share of drinking water does not mean equal amounts of water. Instead, the term "just" refers to a distribution system that attempts to provide all households with the opportunity to access similar amounts of drinking water at a comparable cost. Authorities in the cargo system attempt to provide a minimum amount of water for each household and, by

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[65] I use the concept "communal resource" in its broadest sense to refer to a resource that group members share and manage in common (or share as a collective or corporate entity). In my study of La Purificación, I focus on how members of the community decide on a set of use rights and obligations linked to drinking water management (see Chapter 1; Guillet 1992; Hunt 1992:xiii; Enge and Whiteford 1989:13; on use of religious cargos in regulating access to communal water resources, see Melville 1973). My use of the term "communal" (and related terms such as community-held, community-based, corporate, cooperative, and collective) does not refer, in a more narrow or restrictive sense, to a legal designation, such as a resource managed by comuneros or a federally-recognized agricultural commune, collective, or cooperative.

regulating the timing of the water pump, they set a maximum amount of drinking water that a household can access in any one day. In this sense, "leveling the water" relates to local efforts to limit unacceptable disparities in water consumption that could arise from social and economic differences. Authorities attempt to minimize the risk of having certain households bear a disproportionate burden of water scarcity, and they attempt to "level" the obligatory community labor associated with managing a community-controlled drinking water system. Local authorities claim that their actions are consistent with a community tradition of justice, even as residents continuously recast what counts as tradition.

Other residents, however, challenge this prevailing form of drinking water management. In particular, new residents of the upper and upper-middle strata who have no previous ties to the commnity support urban-oriented principles of drinking water management and view drinking water as a commodified service that ought to be distributed according to a market. In many cases, wealthier residents claim that it would be more just to distribute water based on one's ability to pay, and that households ought to be able to consume as much water as they can afford to purchase with money rather than by fulfilling customary nonmonetary obligations. Others of lower strata, especially from households that rely heavily on wage labor, complain about the requirements of participating in the cargo system,

although some state that they ought to be given more influence in drinking water management. The following sections elaborate on the competing notions of justice that arise among groups in the community.

Basic Features of the Water Schedule

Since the 1980s, most households in La Purificación have been hooked up to the current system that pumps underground water from the well in the ejido to the community nucleus and the colonia. The drinking water committee ensures that the water pump is turned on each morning for about six hours (6:00 A.M. to 12:00 noon). This is enough time to fill the three large water tanks (called depósitos; a rectangular, covered reservoir constructed of stones and cement) on the hillsides above the community and deliver drinking water for at least two hours to each household. The goal of officials is to provide an even distribution to each section of the community so that, theoretically, each household has access to a similar share of water for household use.

There were, however, disparities in that some residents received up to six hours of water every day, and others received less than two hours of water every other day. People were aware of the disparities and noted that they were due mainly to the community's physical terrain and the need to install new pipes in peripheral sections of the water network. In general, people talked about the water

being "level" (parejo) in that everyone ought to have received a minimum share, but most residents knew that technical problems made it nearly impossible to guarantee an equal amount of water for each household.

Depending on their location in the community, most households expect to receive piped water for two to four hours every morning or every other morning. In most cases, as water reaches each household, it automatically empties into household reservoirs. Many houses have cement or fiberglass rooftop tanks and toilet tanks, and some houses (especially of the upper stratum) have large cement cisterns. These types of reservoirs automatically shut off incoming water when they become full, so residents do not need to monitor the flow of water into the household. Households without these reservoirs consist mostly of residents of the lower-middle and lower strata. People rely exclusively on reservoirs that require someone to open and close taps and monitor when the reservoir is full. They are also responsible for preventing the water from overflowing from the reservoir, or they risk being penalized by officials for wasting drinking water. These types of reservoirs include outdoor cement piletas that collect water for doing laundry and washing dishes, and large metal drums (tambos) (200 liters) to use for flushing toilets and for bathing (see Chapter 4). Many households also routinely fill pots and pans, plastic buckets, and wash tubs to store water for future use. Because the water only runs at

limited times, each household is responsible for collecting and storing enough water to meet its needs.

Most people in the community are aware of the water schedule, and men and women often coordinate their daily activities accordingly. For example, people are mindful of filling water reservoirs each day so that they have water stored for future use. Many people bathe and do laundry only when water is being pumped to the house so that, at the same time, the water reservoirs are being filled as well. In this way, the household reservoirs will remain full. People may stay in the household to fill reservoirs, waiting to do errands or to go to work outside the house until the water has stopped running.

Economic differences relate to issues of water storage. Households in the upper stratum may not be vigilant about the water schedule since they often fill large cisterns and use small pumps to supply the household with running water any time of the day or week. These households are more likely to become concerned about water shortages after not receiving water for several days, an issue I expand on in the next chapter. Households in lower strata rely on someone to monitor the schedule of the drinking water. If no one is home to turn on the tap to fill a reservoir, the household may be left with less water. People from these households become concerned on the days that they do not receive water, and people will often notify local authorities the same day in person or by phone about the

problem and ask when they can expect to receive their share of water.

Drinking Water Authority

The seven-member drinking water committee directly administers the drinking water system. From Monday to Saturday, the three main officers of the committee (president, secretary, and treasurer) spend most mornings in the delegación taking care of daily administrative duties. They also work most Sundays, and they spend many afternoons and evenings dealing with the water system and other community issues. Civil officials often told me, laughing at the time, that their cargo requires them to work 24 hours a day, seven days a week, 365 days a year, for three years. This is especially true with regard to drinking water, which users expect to receive almost every day.

The community can only afford to pay for enough electricity to run the water pump for about six to eight hours each day, so coordinating the pump's schedule is an important task. The drinking water committee's four auxiliary officers, called fontaneros, are responsible for actually distributing drinking water to each section of the community, a process that requires the opening and closing water valves.[66] Each fontanero works a week at a time, and

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[66] The term fontanero literally translates as "plumber," and refers to the person who supervises the actual distribution of water by opening and closing valves for the system of pipes and large water tanks. The position is

they rotate their tasks each week. In practice, all officers of the drinking water committee supervise the actual distribution of water through the system. The fontaneros also pay a man to work early each morning to open and close water valves and channel water through the main pipes and large water tanks (each with a capacity of over 250,000 liters). He coordinates his work with the man who lives next to the drinking water well in the ejido and is responsible for guarding the water well and turning the pump on and off each day.

Members of the drinking water committee have a number of responsibilities, including: collecting user fees, supervising water projects, paying electric fees for the water pump, obtaining materials for maintenance and expansion of the drinking water system, authorizing contracts for new household drinking water connections (tomas), shutting off water connections, imposing sanctions on water debtors, and addressing problems with water delivery. The committee routinely coordinates these tasks with other civil authorities, three paid workers, and several local plumbers authorized to install household water connections (tomas) and fix problems. At any one time, about 15 people consisting of community representatives and paid workers are involved in directly managing the drinking water system. Their work, however, involves more than

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parallel to that of the aguador who oversees the actual distribution of irrigation water (see Chapter 5).

simply coordinating the actual delivery of water through pipes and water tanks. It also includes coordinating their duties with the general body of civil authorities.

All civil authorities in the delegación, not simply the authorities of the drinking water committee, have some control of the drinking water system. Consequently, this control of a vital resource for all residents allows authorities to exercise their organizational power over other residents. Below in other sections, I examine how drinking water issues involve the articulation of households with civil and religious institutions in the community and how maintaining access to drinking water is related to abiding by customary law.

The pattern of electing people to cargo offices has changed in the last few decades, especially since the community instituted a roster (rol) for electing people to offices. Residents refer to the roster as something that is "level" (parejo) in that, theoretically, every head of a family or property owner is obligated to provide community service in an office when called upon. The community instituted a civil roster and a religious roster, and both rotate from house to house in the two halves of the community. For example, 40 people are elected to serve in the mayordomías, but 20 or so people represent a group of adjoining households located in one half of the community and the other 20 people come from a group of adjoining households in the other half of the community. The roster

rotates from section to section, so that if a resident has a neighbor in the mayordomía, the resident knows that he or she will be elected to an office within the following one or two years. In fact, in everyday conversation, people regularly talk about the number of years it will take for their household to appear on the roster. At the end of a term, office holders have a meeting to discuss who among their neighbors with adjoining properties ought to be elected for the following term. The authorities bring their recommendations to the community assembly to be voted on by household representatives attending the assembly.

To the minds of many residents, the roster has egalitarian dimensions and seems parejo. However, an analysis of who is elected to the highest cargos reveals some nonegalitarian tendencies in the election process. Specifically, established male residents with ties to local agriculture and the use of irrigation tend to occupy the higher civil officers. The process of electing people to civil and religious offices concentrates power in those residents who have experience with communal management of water and other local resources.

For example, the community is supposed to elect men from the roster of households to fill civil posts, and the roster is supposed to be "level" (parejo) in that it rotates in an orderly fashion among all households. According to several civil authorities, the delegación officers continuously discuss who is next on the roster to have an

idea of which men are eligible to be elected to civil cargos. They discuss who should be proposed as candidates at the community assembly and who should be selected to hold the top posts. If there are no suitable candidates for a top civil post, authorities may propose someone whose name is not on the roster. Residents referred to this method of selecting top officers as "jumping and skipping around the community" (brincando y saltando por la comunidad), which was similar to the method used in previous decades (particularly before the 1970s) when all civil and religious posts rotated among a smaller group of households. Authorities explained that the highest offices required people who knew about the community and its customs and would be able to work hard and organize others to work together. Others told me that top officers also needed a way to sustain themselves during the three-year term, so the community selected people who would be able to rearrange their work schedule to be present in the delegación. It also was advantageous for top officers to have vehicles and phones to be able to carry out their duties. As a consequence, this election process favors the selection of established residents (all males) from the commercial segment of the upper stratum and others with ties to agriculture from the two middle strata.

Furthermore, at the same time that delegación officers discuss who to elect, ejidatarios discuss who to elect to serve ejido posts for the same three-year period.

Ejidatarios hold their election of new officers a few months before the elections for the next term of delegación officers. According to several civil authorities, the ejidatarios elect people to ejido posts, but they reserve a few candidates to fill civil posts in the delegación. In particular, they attempt to reserve at least one ejidatario who could be elected as one of the three delegados. In this way, interests of ejidatarios are represented in each administration of civil authorities.

This election process limits other residents from gaining access to the organizational power of the cargo system. In particular, residents without ties to agriculture are less likely to have their interests represented in the delegación. After identifying people to fill the top civil posts, civil officials usually use the roster to fill the bottom posts. People from the professional segment of the upper stratum are usually elected to bottom posts, and are not elected to top posts, even though they are highly educated and have high incomes. New residents of all socioeconomic strata are not elected to top posts, which authorities justified because new residents are not familiar with the customary rights and obligations. Thus, new residents, females, and residents engaged in wage labor with little or no ties to local agriculture tend to occupy lower cargo offices and fulfill small, short-term tasks such as being a group leader to notify people about faenas.

In fact, many new residents are explicitly excluded from holding certain offices. For example, the civil and religious rosters do not rotate among colonia households, and the population of the colonia consists overwhelmingly of new residents and those of the lower-middle and lower strata. Instead, the community elects a few colonia residents as auxiliary members of the citizen's participation council and expects all colonia residents to fulfill specific types of annual community labor obligations (e.g., sponsor posadas during Christmas fiestas and clean the cemetery grounds before Day of the Dead ceremonies). Colonia residents are not elected to the drinking water committee and have very little representation in other civil offices that influence drinking water management. The earliest settlers of the colonia had to sign contracts agreeing to fulfill community customs regarding civil and religious matters. Many colonia residents complained about having to submit to the community's authority without being able to occupy the highest positions of authority.

Drinking water authority is vested in a particular drinking water committee, but the committee's work is embedded within the community's system of civil and religious offices. The next sections illustrate the consequences this sort of political organization has for handling other dimensions of drinking water management. All local authorities influence the creation and enforcement of local policies and practices involved in managing drinking

water as a communal resource rather than a commodified service.

Negotiating Water Rights

Access to drinking water is also considered "level" in that every community resident has a use right (derecho) to a fair share of drinking water. Residents also refer to communal use rights as "benefits" (beneficios) that one gains by being a member of the community. In order to exercise this right, however, residents have to fulfill corresponding community customs or obligations. This set of drinking water rights and obligations is embedded within a set of customary laws that residents refer to as "uses and customs" (usos y costumbres). This set of unwritten principles is passed on orally and is flexibly remembered, enacted, and practiced. Customary law guides decisions about using community resources and fulfilling customary communal labor obligations.

In many cases, there is not necessarily an explicit relationship between a use right to drinking water and particular customs. Rather, people refer to a set of general principles that allow all community residents to have use rights to community resources as long as they fulfill community customs. That is why, for example, community residents say that a resident and his or her household have a use right to drinking water as long as the household pays water fees, completes faenas for community

projects, and accepts service in civil or religious offices whether or not an office is directly related to drinking water management. These local principles of communal management of drinking water differ from outside views of drinking water as a service that one receives in exchange for money. This distinction is reinforced by a more general value of "level" (parejo) rights and obligations regarding communal resources. Residents give constant attention to ensuring that each community member receives a fair share of community benefits and fulfills a fair share of community obligations.

As I note above in Chapter 5, "Laboring for Water," community authorities drew on longstanding principles and practices related to managing surface water for irrigation and domestic use. Residents have been obligated to contribute to community activities such as cleaning irrigation canals, accepting mayordomías, and occupying civil offices. Residents who refused to fulfill these obligations where cut off from the surface water for irrigation and domestic use.

The recent development of a piped drinking water system from underground sources has incorporated similar principles and practices of communal water management. Since the initiation of the project, people understood that community residents could automatically claim the right to drinking water and that they would be obligated to fulfill community customs. Initially, each household who wanted access to the

new drinking water system provided a small monetary contribution (una cooperación) as well as continuous unpaid labor to dig wells, install pumps, lay large pipes over the mountainous terrain, build large water tanks, and install the drinking water network in each section of the community. Thus, early in the development of the drinking water system, residents associated the use right to drinking water with the fulfillment of community labor obligations.

Once the drinking water system was installed, however, new people who moved to the community expected to be able to obtain drinking water as a paid service, much as they did when living in nearby urban areas. Similarly, younger generations of established residents hoped to build their own houses and requested drinking water service without having to engage in the kind of work that earlier generations did to install the system. By the 1980s, the community infrastructure included a piped drinking water system as well as electricity, telephone service, a paved road connecting the community to a highway, regular transportation with vans, minibuses, and buses, local schools, and a medical clinic. These changes made it more possible for people to reside in the community and make a living by commuting to wage-labor jobs outside of the community. In this sense, the community opened itself to the wider society in new ways by incorporating infrastructure and in-migrants, stimulating increased demand for drinking water. In fact, as I explain below, requesting

drinking water has become a primary manner in which people "enter" the community and gain access to other resources.

Wolf (1957, 1972, 1986) has noted that corporate peasant communities in Mexico and elsewhere often have attempted to obtain community closure, in the sense that they have instituted policies and practices to prevent nonresidents from gaining access to limited community resources, primarily land and irrigation water for agricultural production. In La Purificación and other Northern Acolhuacan communities, one became a community resident through birth or marriage, and outsiders were restricted from purchasing land. During my fieldwork, I noted that communities in the sierra zone enforced local laws prohibiting the sale of land to outsiders, and residents in the La Purificación recall that they had similar customary laws until about the 1960s. After that time, it became difficult to make a living by agriculture, and land became more valuable to sell as small plots for residential use. Selling land has become a private transaction involving an exchange of money between buyer and seller. After purchasing land, new owners are supposed to register themselves as community residents with the authorities in the delegación. However, in many cases, people spend time building the new house and moving to the community and do not immediately report the transaction to local authorities. Purchasing land may give one a physical presence in the community but not a social presence.

Invariably, however, new residents request drinking water service from civil authorities. At that moment, new residents discover that they cannot pay for water in the same manner as they paid for land. When they ask for drinking water services, new residents notify authorities of their permanent residency status and expect to pay for drinking water services. Community authorities explain to new residents the requirements of fulfilling customary obligations, requirements that many sellers do not explain. It is at this point that new residents learn that the cost of obtaining the right to access a community resource entails much more than simply paying a monthly water fee. New residents with previous ties to the community may understand this point, but some do not understand the full implications of abiding by local customs in relation to drinking water. Most new residents without previous ties to the community are less likely to understand the local usos y costumbres and often express dismay to learn that obtaining drinking water is linked to such things as cargo and faena service. In this sense, new residents "enter" (entran) or become part of the community and begin the process of negotiating their social position regarding access to community-controlled resources and the fulfillment of community obligations. The distribution of drinking water defines the community's social boundaries in much the same way that the distribution of irrigation water and agricultural land did in the past.

Established residents base their claim to the use right to drinking water because they contributed money and labor during the initial installation of the drinking water system. Some people worked more on the project than others, but each household was required to contribute similar minimum amounts of money and labor. To the minds of established residents, it is not "fair" (justo) that new residents not involved in the initial development efforts are able to request drinking water without making similar contributions. I often heard people refer to this injustice with the analogy of people coming to eat a meal after others had prepared the food and set the table.

Consequently, the community has developed policies for charging households for the use right (derecho) to drinking water and for registering a household water connection (toma). These policies have emerged and changed with each new administration of civil authorities and with debate at annual community assemblies. In 1995, authorities charged fees for new connections to the water system based on categories (categorías) that corresponded to one's residential status in the community. Officially there were three categories: 1) established residents ("natives," nativos) who have contributed (han cooperado) in the initial development and management of the water system and who have fulfilled other community obligations were charged the lowest fee of $2,000 pesos or less (in 1995, $6.00 pesos = US$1.00); 2) established residents (such as children of

those in category 1 above) who did not contribute to earlier water projects but have contributed to the community in other ways were charged a middle category of $2,000-4,000 pesos; and 3) new residents ("nonnatives," no nativos) and even some established residents who have never contributed to community projects were charged the highest fee of $6,000-8,000 pesos. In other words, new residents provided two or three times more money than established residents to obtain the use right (derecho) to drinking water and register a household water connection (toma).

These categories illustrate the relationship between socioeconomic stratification and residency status. Many established residents view new residents as "rich," particularly if they are professionals or commercialists of the upper strata who purchased large properties for residential use in the community nucleus. Further, established residents with ties to agriculture view themselves as "poor campesinos" and expect to be able to receive rights to drinking water in exchange for fulfillment of labor obligations rather than simply in exchange for money. However, as I explain below, established residents are in control of the drinking water system and may not be likely to institute higher fees for the commercial use of water, especially since established residents are more likely than new residents to use drinking water for local commercial activities (i.e., greenhouses, small businesses). Many households in the colonia consist of new residents of

the lower socioeconomic strata, but they arrived before these categories were established and avoided paying the higher access fees.

These categories pertain to obtaining a household connection to the drinking water system, and all are registered for domestic water use (i.e., noncommercial) in the drinking water committee's accounting books. Each registered user is authorized to have a connection that is no larger than a pipe with a 1/2-inch diameter, a requirement that water authorities told me is part of Mexico's national water policy. To date, there are no categories for commercial use of the drinking water, and the community has prohibited the use of connections larger than a pipe with a 1/2-inch diameter. There have been ongoing discussions and disputes about how to charge for the use of drinking water for newly established restaurants, hair salons, dry-cleaning and laundry services, and greenhouses. Community archives show that community assemblies have passed resolutions to charge greenhouse users for drinking water consumption, but I did not find information that this has ever been the case. Generally, greenhouse owners are established residents who obtained water connections when the system was originally installed for both irrigation and domestic use. In a few cases, however, it appears that some greenhouse owners paid at the rate of the lowest category for a household water connection and used the water to supplement irrigation water supplies. Water authorities

told me that this has become increasingly difficult for others to do because community residents have voted at community assemblies to reserve groundwater for domestic purposes.

People request the use right to drinking water by negotiating a household water connection with all delegación authorities and not simply with members of the drinking water committee. I observed several encounters when community residents came to the drinking water committee to request a water connection and were surprised that the fee was at least $6,000 pesos. In each encounter, the people making the request asked if it was possible to get a lower rate. Many offered to prove that they had contributed money and labor to earlier water projects and other civil and religious community activities. For instance, some showed receipts for contributions to water projects and official documents (comprobantes) signifying proof of completed labor obligations. The drinking water committee also requires the person to fill out a form to collect signatures and seals of the delegados and the other civil committees (Consejo de Participación Ciudadana, and Comité de Agua Rodada). The signatures from the other committees confirm that the person is up to date on their payments and has fulfilled community service obligations for guardias and faenas. In same cases, people proved that they had completed a year of mayordomía service, which allowed them to be exempt from a year of other types of community service. In many cases, the person

had to discharge previous unpaid obligations by paying money or contributing bags of cement equivalent to the number of faenas missed in years past. Civil authorities charged a higher category of $8,000 pesos to a few people who refused to be up to date in their payments. The drinking water committee distributed the money among the other civil committees to cover the person's debts.

This process of negotiating access to drinking water illustrates that drinking water authorities are a central part of the community's political organization and that the control of drinking water is a source of power for civil authorities in pressuring residents to cooperate in community affairs. The other civil committees also derive power in this way. When someone requests any service (e.g., a cemetery plot, official registration of their property, or materials for road repair), authorities may deny the request until the person takes care of delinquent drinking water debts. In this way, all civil authorities are involved in various dimensions of drinking water management.

For example, during my fieldwork, the local ejido officers met with officials from the Procuraduría de la Reforma Agraria about granting private titles for people who had built houses in the colonia on land that the federal government had officially designated as ejido land for agricultural use and not residential use (see Chapter 4). Government officials called an assembly of residents who were not ejidatarios or ejidatarias but who lived on ejido

land in the colonia. Officials told the residents that they had to abide by local regulations passed by the voting body of ejidatarios and ejidatarias in order to receive a title to land. Ejido officers and delegación officers (many of whom where themselves ejidatarios) met to discuss how to formally grant the titles and passed a resolution stating that the signatures of local officials would be required on requests for a title to the land. However, in order to obtain such signatures, the person making the request had to be up to date on his or her payments at the delegación, especially with regard to drinking water bills. This illustrates how the authorities coordinate their activities in relation to drinking water issues.

Most authorities agreed that they were charging a large amount of money for the use right to drinking water and for establishing a registered household water connection. Authorities explained that the money is used to help pay for improvements and repairs of the system, as well as day-to-day costs such as paying the electric bill for the water pumps. Authorities justified the higher categories for new residents by pointing out that the water system is expensive to run, and that the community needs to recover costs from new users who benefit from the system but who did not contribute money or labor during the initial development of the system. Authorities also indicated that new residents are less likely in the future to contribute labor or money to drinking water projects, so, in their view, it was

necessary to apply such charges for access to drinking water. The higher fees are both a contribution for benefitting from earlier efforts of other people and a form of anticipatory tax to pay for later costs. Authorities also noted that wealthier new residents (of the upper and upper-middle strata) had different water-use practices, such as using drinking water to wash cars, cultivate ornamental flower gardens, fill large cisterns, and even build swimming pools.

Some authorities also suggested that high fees may help limit further in-migration and thus limit population pressures on the water system. The 1994-1996 administration used drinking water policies to prevent the construction of a multifamily housing unit on private property. Authorities notified the owner that they planned to charge at least $6,000 pesos for each apartment's water connection rather than charging for only one connection for the housing unit. This issue led authorities to post the public signs warning home buyers to not be tricked into purchasing property that did not include a drinking water connection. Water policies may limit in-migration, but, in my view, the use of differential categories may also have had the unintended consequence of favoring the in-migration of wealthier people who support obtaining a new connection to the water system in exchange for money alone rather than money plus labor.

After paying the required fees, a person receives a contract (<u>contrato</u>) for a household connection (<u>toma</u>) to the

drinking water system. Drinking water contracts have a place for people to sign indicating that they agree to abide by the community's customary laws (i.e., usos y costumbres). A similar wording is found in contracts for registering land with the community authorities. The water connection remains in the person's name and is a right that can be transferred if the person moves to another property (which is rare). Usually it is simply "sold" with the property, which involves another contentious issue in the community. People know that the value of land can double or triple if it includes access to drinking water. Thus, people think it is fair to charge high fees for a water connection, since the person may be installing water to make a personal profit (hacer negocio) by selling land with water access.

The terms of such contracts make sense to established residents, even if the implications of the contracts are not explicitly stated. Contracts do not state, for example, that the use of drinking water obligates someone to complete mayordomía service when called upon. Established residents understand that "it is customary" ("es la costumbre"). On the other hand, new residents without previous ties to the community are surprised to find out about such obligations unless a local authority explained this to them during the official registration of their property. New residents are also frustrated that, after paying thousands of pesos for a registered drinking water connection (toma), they have to provide additional funds for the labor and materials needed

to connect their household to the drinking water system. Each household must pay for the connection themselves, which costs another few hundred pesos. It entails choosing and buying materials (e.g., valves, copper and galvanized water pipes, rubber hoses, spigots) and paying an authorized local plumber to connect the household to the main water lines. These issues have generated disputes between new and established residents, and, in turn, have led authorities to codify customs to inform new residents of their rights and obligations.

This illustrates that becoming a recognized community resident is a process, and one that involves negotiating for drinking water. In other words, negotiating for the right to drinking water is a principal way of establishing a social contract between citizen and community. Established residents commonly refer to "drinking water service" (el servicio del agua potable), but, to most minds, drinking water is not a "service" that one exchanges for money according to the quantity consumed. It is a service to which one gains access by abiding by local customary law. It is not like purchasing electric, telephone, and gas service from companies seeking to make a profit. In La Purificación and other communities in the region, drinking water service also contrasts with urban systems, which treat drinking water as a commodity. New residents, who often hold urban views of drinking water, often engage in conflicts, disputes, and negotiations about the meaning of

drinking water. In contrast to urban system, the community attempts to provide a fair and adequate distribution of drinking water to all residents, but community authorities maintain tight control over drinking water and have withdrawn it to impose a sanction on those who do not fulfill community customs.

Negotiating Water Obligations

The process of negotiating water obligations reflects a local concern for "leveling the water." After obtaining an authorized connection to the drinking water system, a household is obligated to pay for its water consumption. In 1994, authorities began charging $25 pesos/month or $300 pesos/year. Residents pay on a per household basis rather than per resident or per volume of water consumed. In 1995, authorities expected to supply a minimum of two hours of water daily or every other day to each household. In this way, theoretically, everyone was paying the same fee for the guarantee of receiving a similar minimum amount of water.

Community authorities propose the water fees at annual community assemblies and residents vote to accept or reject the fees. Authorities calculate the fees primarily based on the total amount of electricity used to run the water pump, so that, in a sense, residents pay for electricity not water. The fees are also based on the estimated costs of maintenance, repair, and improvement of the water system.

In addition to using different categories to charge for the right to water access, various administrations have instituted categories for charging for monthly water use. When the water system was first installed in the 1970s, there was little need for such categories since most residents had similar houses, similar patterns of water consumption, and similar levels of participation in cooperative labor projects to develop the drinking water system. Once in place, however, the water system provided a powerful incentive for new residents to move to the community, especially professionals of the upper socioeconomic stratum. They have built large permanent houses and weekend country houses (casas de campo) with large cisterns, water pumps, and indoor plumbing for multiple flush toilets, showers, and laundry facilities. They also used drinking water rather than irrigation water to maintain lawns and ornamental flower gardens. To established residents, it seemed obvious that larger houses would require more drinking water than typical households. This sort of household water system is something that smaller households, especially those of the lower-middle and lower strata, could not afford to build, so they have relied on the daily supply of water to the house. These economic differences, in part, led to proposals to use categories of water fees. This also reflects how established residents, who often characterize themselves as campesinos and poor,

have created and imposed policies on new residents of the upper strata.

With the support of general community assemblies, the community has instituted, in broad terms, four categories: 1) regular users with small or average size houses pay $25 pesos/month; 2) rental units pay $50-75 pesos/month; 3) regular users with large houses (called casa residencial) pay $75 pesos/month (in some documents this is referred to as the "rich class" [clase rica]); and 4) unoccupied houses whose owners do not consume water but want to maintain their right to a water connection pay $12.50 pesos, called half consumption (medio consumo). Water authorities, however, explained that it was a difficult policy to enforce. Over time, authorities have not used the categories and have ended up charging the same fee for most types of houses. Once a civil authority in one administration granted a lower rate to a resident, it was difficult to change it to a higher rate later, even if the household obviously used more water than other households. One authority explained that the changes in administrations every three years provided opportunities for residents to negotiate lower water fees with new water authorities. This is especially true if a resident had a family member, compadre, or neighbor newly elected to a civil office.

In addition to monthly water fees, residents are obligated to pay other special user fees for repairs of the drinking water system. For instance, the drinking water

committee, upon starting the 1994-1996 term, charged every registered water user $110 pesos for repairs of the damaged water pump. Water users are also obligated to contribute labor to faenas for drinking water projects, or, alternatively, they can pay money or contribute materials toward the project. For example, from 1995 to 1996, the drinking water committee organized a series of faenas to build a new water tank in Barrio de La Concepción Norte. Each registered water user was expected to contribute labor for at least three faenas per year for the project. Those who did not complete three faenas would have to pay $35 pesos/faena or its equivalent in materials such as bags of cement.

Officials register each water connection in one person's name for each household. People with more than one house may have separate connections registered in their names. Residents, however, seek to use the water as they see fit, and once they have one connection, they may use water for more than one household. This is especially true when grown children stay with their parents and build a separate dwelling on the family property. They simply extend the water line with pipes or hoses to the new dwelling without registering the separate water connection with community authorities, a practice that technically is illegal. Authorities called it a form of clandestine (clandestino) water connection.

Of course, water use is very public and people knew that each community resident relied on community water resources for bathing and drinking. Many people in the community expected each male-female couple (matrimonio) to pay for their consumption of water. People used the term matrimonio to refer to both married and unmarried male-female couples living together. In this sense, a couple rather than household was the locally recognized social unit for measuring water consumption. Single adult children or unmarried women with children were not expected to pay separate water fees while they lived in their parents' household. Also, an elderly parent living with adult children was not expected to pay separate water fees.

The issue of who should pay for water consumption was an ongoing debate that regularly appeared in the minutes of annual community assemblies, and it was an issue I heard people discuss in numerous encounters concerning drinking water. Some households that pay $25 pesos/month for water consumption have several married couples and as many as 20 people living on a property with only one water connection. In community assemblies and other encounters, residents pointed out that it was not fair that a household of two adults with no children paid the same amount as a household of two or three couples and their children. Officials said each couple should be obligated to contribute to the water system, just as each adult male (ages 18 to 60) is supposed to fulfill guardia service and each property owner (male or

female adults less than 60 years old) is obligated to fulfill cargo service and faenas.

The customary manner of charging for water is a point of contention for new residents who regularly question the relationship between drinking water and faenas, fiestas, and family units. They argue that water consumption ought to be linked to a particular property regardless of how many people or couples live on the property. New residents suggest that it should not matter how many people live in the household as long as the registered water user pays the monthly water fee. Encounters concerning drinking water involve discussions concerning family, household, and marriage.

Many residents of the lower-middle and lower socioeconomic strata could not fulfill the obligation of paying the required monthly fees to receive drinking water. Authorities allowed residents to consider nonmonetary alternatives for fulfilling their obligations. Authorities allowed some people who were behind in their payments to provide extra labor on repairs and expansion of the drinking water system. Some people completed extra faenas to finish the new water tank, which pleased civil authorities who needed labor to finish the project as much as they needed money to purchase construction materials. At times, local plumbers, bricklayers, construction workers, and day laborers (jornaleros) worked on the water system in exchange for various months of water supply. In fact, civil

authorities noted that one advantage to the community-controlled water system was that it cost less to "pay" for people's labor with a few months of water rather than with money. Furthermore, a water official noted that some people were so poor that they would never be able to afford to pay water fees. The alternative methods of payment illustrate the flexibility of the system and reinforce the notion that drinking water is a communal resource rather than a commodity. What counts is that people contribute their fair share of a combination of money and labor to maintain the right to a fair share of drinking water.

Practices of Cooperation

Authorities asserted, and most established residents would probably agree, that receiving a household water connection implied more than simply the obligation to pay user fees and contribute labor to water projects. As I indicated above, water users are also expected to fulfill a range of related "customs" (costumbres) and "traditions" (tradiciones) that involve what I refer to as practices of cooperation. I examine these forms of cooperation because many of los Purifiqueños insisted that residents cooperate (cooperar) in the community's system of rights and duties. A person who contributed time, money, and labor to the community is referred to as a "cooperator" (cooperador/a) and "hard worker" (jalador/a or chambeador/a). A person who

did not "cooperate" is considered a debtor, as I explain below.

There is a flexibility and creativity to fulfilling such customs and traditions, and there is no codified list of obligations for each resident. It is tradition that each resident should contribute to the benefit of the community and, in turn, each resident can expect to receive benefits, with drinking water being a major benefit. People participate in a wide range of public works projects (obras) that may or may not be directly related to drinking water. Failure to comply results in the risk of being penalized, including having local authorities physically sever the household's connection to the drinking water system.

During my research, I observed and participated in numerous faenas coordinated by the entire body of civil authorities. Some projects were related to the drinking water system, including the construction of a fourth drinking water tank for households in Barrio de La Concepción Norte and Barrio de La Concepción Sur, and the replacement of damaged pipes with new pipes in the colonia. Projects also dealt with other areas of community life, including: the construction of a new and larger dam for irrigation water located on property that was in dispute by a group of landholders (who called themselves comuneros) from the neighboring community of San Miguel Tlaixpan; the improvement of the irrigation system by replacing canals dug

in the earth with cement canals, which limited leakage; and the improvement of several streets in the community.

These undertakings were initiated in 1995 and 1996, during Mexico's economic crisis. It is a testimony to the community's customary way of mobilizing resources that it could accomplish these projects during the crisis. Local authorities mobilized the system of local leadership and expertise and unpaid faena labor. They also used local construction materials (e.g., rocks, sand, community land). Let me underscore that these efforts consisted of time, labor, money, and other resources from the entire body of officials in the delegación and the ejido as well as the residents fulfilling community obligations.

Community authorities also used their knowledge of and ties to the broader political system to obtain construction materials from the municipio and other government entities. Most of these projects required civil authorities to spend days in disputes and negotiations with other communities, municipio, state, and federal entities, legal officials, engineers, and suppliers of construction materials. Some of these encounters involved working with political party officials, particularly elected officials from the Partido Revolucionario Institucional (PRI). For example, I was present during a meeting when an official from the PRI met with the officials from the delegación and the ejido before upcoming elections. The PRI official asserted that everyone present knew that public works completed in the past year,

including drinking water projects, were the result of efforts by the PRI ("son obras de la PRI").

Such statements are probably related to the fact that elected officials from the PRI and other PRI-organized programs, such as PRONASOL, have been involved in La Purificación's drinking water projects. However, there were tensions emerging in the Municipio of Texcoco, and a rival political party, Partido de la Revolución Democrática (PRD), was taking credit for sponsoring drinking water projects in some communities. One civil official in La Purificación, speaking of obtaining materials for a drinking water project, told me something to the effect that "if they want us to be PRI, we are PRI, and if they want us to be PRD, we are PRD." Another authority commented that he thought the emerging rivalry in the municipio may have been benefitting La Purificación because authorities had a chance to play the rival parties against each other and obtain much needed materials and funds for public works.

In addition to this sort of work by cargo officers, practices of cooperation may extend to nonobligatory, unremunerated forms of work. For example, during the same period, residents also engaged in voluntary work with a newly formed drinking water commission that went house to house requesting payments from debtors so that authorities had sufficient funds to pay electric fees to run the water pump. People made the problem social by engaging in public, face-to-face encounters in an effort to "pressure"

(presionar) and "shame" (dar vergüenza a) debtors. Practices of cooperation also include attending community assemblies, responding when someone rings the church bell to alert the community about an emergency (e.g., fire, land invasion and robbery), and assisting in the burial of a corpse in the community cemetery. These tasks were voluntary, and failure to participate did not put someone at risk for receiving an official penalty, but, according to many residents, it may "look bad" ("se ve mal") to not participate, and it may hurt one's chances of receiving similar aid in the future (e.g., to deal with a house fire, road repair near the house, or burial of a dead relative).

Mayordomías and Cooperation

Mayordomía service was a significant expression of cooperation in the community. Each household is expected to contribute to the mayordomías, which involves paying annual contributions to support the fiestas and maintain the church buildings and properties. In 1995, each household paid $168 pesos in an annual contribution. Contributing to the mayordomías may include accepting smaller cargos when called upon by mayordomos. They may involve sponsoring a rosary for one day during the months of May and June, providing a meal during a fiesta, or sponsoring some part of a religious celebration during Christmas or Easter. Most importantly, each property owner is obligated to serve for a year in the mayordomias or risk having authorities shut off the

household's drinking water. As I describe above, the community roster (rol) of male or female property owners indicates which people should be elected each year to the mayordomías.

There is an issue of people not accepting these religious offices, and community officials have pressured people to contribute their time, money, and labor to mayordomía service. As a result, officials have decreased the burden of serving in these offices. There has been a tendency to increase the number of mayordomías and spread out the work and cost of the fiesta sponsorship. Church records indicate that before the 1990s, the community elected eight to ten mayordomos each year, but in the 1990s the community began electing 40 mayordomos each year. In 1995, however, many people struggled with the economic crisis and did not want the economic responsibility of sponsoring the upcoming annual festivals for 1996. In meetings between civil and religious authorities, some residents selected for the 1996 mayordomías said that it was not fair for a few families to accept the burden. Residents said they would not accept the cargos if community authorities did not obligate those appearing next on the roster to accept a cargo. Everyone, they argued, would benefit from and enjoy the masses, dances, music, fireworks, and meals, so everyone should cooperate in this community custom and provide mayordomía service when called upon.

Eventually, to pressure people, civil and religious authorities held a community assembly on December 31, 1995. Few community residents attended the meeting, but those present passed a resolution to have civil authorities shut off people's water if they did not accept mayordomías. Eventually, by January 1996, 40 men and women accepted the mayordomía offices and organized the annual cycle of religious fiestas. A few other people signed agreements with civil and religious authorities promising to serve in 1997 if they could be exempt from service in 1996.

A few month later, religious authorities pressured the civil authorities to abide by the resolutions passed at the community assembly. In the summer of 1996, mayordomos accompanied civil authorities to various households to warn people with water debts (i.e., civil monetary debts) that their household drinking water would be shut off. At the same time, the mayordomos warned members of the household that they also needed to be up to date in their obligatory annual religious contributions (limosnas) for the fiestas or risk having their drinking water shut off. In other words, the religious officers reminded households that they were expected to pay both civil and religious fees or risk having civil authorities impose the same sanction. During one particular encounter, a member of the group who is a new resident of the community pulled me aside to point out that the officials were blending civil matters with

ecclesiastical matters, something that he was sure was not permitted legally in Mexico.

Most established residents, however, seemed to accept the blending of civil and religious matters and noted that "it is customary" ("es la costumbre") and part of the local system of usos y costumbres. Members of the drinking water committee also accepted this blending and suggested that sometimes it was to their benefit. Several Sundays, for example, religious authorities went house to house to collect contributions for fiestas and threatened people who did not pay that the mayordomos had the authority to have the household's drinking water shut off. After several Sundays, people came during the week to the civil offices and paid their drinking water debts. Water authorities said that the mayordomos provided one way to pressure people to pay drinking water fees.

Death and Cooperation

The cemetery holds a special place in community life and figures in local struggles over drinking water. The cemetery is one of the places that symbolizes community identity, since, as residents reminded me, "we all go there sooner or later." The cemetery is the community's only place to bury the dead, and, in addition, it serves as the place for the annual Day of the Dead ceremonies in November, for building small monuments to honor community residents, and for gathering family to place flowers on graves at

special days (e.g., Easter) and on anniversary dates of a dead relative's birth, death, or patron saint's day.

In conversations, people frequently discussed drinking water and cemetery plots at the same time when referring to rights that residents gain by fulfilling community customs. When people urged authorities to impose a sanction on people who refused to serve civil and religious cargos, they often said that authorities should shut off the household's drinking water connection and deny debtors access to the cemetery. People who contributed to the community, on the other hand, expected to receive plots to bury dead family members, and they counted on receiving help to bury the dead.

These issues emerged regularly during each Sunday when mayordomos went house to house collecting household contributions for the fiestas. I noticed that some nonresidents visiting kin on the weekend donated money to mayordomos and received written receipts. Some visitors told me that they had contributed to other projects dealing with drinking water, the schools, and road construction. They usually kept a stack of receipts to support the claim that "I have cooperated with the community," ("he cooperado con la comunidad"), which was useful for the day when their kin had to request burial rights for them in the community cemetery. In contrast, I was present in the delegación when some families with histories of not contributing to the community sought to bury a dead relative, and they quickly

learned that they had to pay civil authorities a sum of money (thousands of pesos) or look for an alternative cemetery.

The alternatives were not appealing. Many people avoided what they called "ugly" (*feo*) public cemeteries in Texcoco and Mexico City. Public cemeteries charged substantial fees to bury a body and occupy the grave for seven years, the time given for the body to decompose. Unless the family paid a "perpetual" fee every seven years, cemetery officials would dig up the body, scatter the bones, remove the grave marker with the person's name, and use the grave to bury the body of an unrelated person. People worried that this "ugly," impersonal burial meant that dead relatives would be abandoned and forgotten. By contrast, los Purifiqueños viewed their community's cemetery as a respectable burial place, not a place to buy and sell plots. A family could bury a body in a grave and, after seven years, bury another dead relative in the same grave, but they placed grave markers for each dead person. The cemetery expresses social bonds and mutual support between citizen and community, and it is a place where families can remember the dead.

Officers in the civil-religious hierarchy made major decisions regarding access to cemetery plots and burial rights. *Mayordomos* (not the priest or other religious official) give and deny families permission to use the church for burial mass and to toll the church bell on the

days of the person's death and subsequent funeral. The church bell calls people to gather to help the dead person's family by praying, consoling the family, and bringing food to the house. The bell also calls men to assist the family in digging a cemetery plot, which is a laborious task usually involving a group of ten or more men with their own picks and shovels to dig for hours to penetrate the rocky soil and open a grave for the coffin. Some people refer to this work as a faena, although it is not officially regarded as a general faena by community authorities.

Mayordomos could also recommend that civil authorities not assign a burial plot to someone until the family was up to date in paying fees related to mayordomía service or festival sponsorship. Civil authorities give families permission to use burial plots, and someone from the Consejo de Participación Ciudadana accompanies family members (often exclusively men) to assign a burial plot. Officers did not charge residents for a burial plot, but they did verify that members of the household of the dead person were up to date in their obligatory community contributions, especially for drinking water. I observed several cases of civil officers requiring families to pay money to be up to date in their fees related to faenas, guardias, and drinking water bills before assigning a burial plot. Authorities did not like taking these measures. "It is sad" ("es triste") said a water authority about these cases, but "it is the only way"

("es la única manera") to pressure residents into fulfilling their obligations.

Death was a moment when households were involved in the community's practices of cooperation. Officers of the civil-religious hierarchy managed central activities surrounding burial and expressed a dead person's social ties to the community. Authorities granted access to cemetery plots and, in a sense, "opened" access to community resources to residents who had participated in and worked for the benefit of the larger community. On the other hand, authorities "closed" community resources to those who had not cooperated. Death of a family member is a poignant moment in people's lives, and the community has controlled key resources involved in death practices. Contributing to drinking water development helps ensure that one will receive a proper burial in La Purificación.

Issues of death and religion involve practices of cooperation and illustrate the prominence of drinking water in community life. Residents engage in a wide range of practices that express a bond with the community. In effect, one's connection to drinking water symbolizes a social bond one has with other residents engaged in activities that have a collective benefit. One has a right to benefit from community resources -- drinking water, the church, emergency assistance, respectable burial sites -- as long as one also contributes to the community.

In my analysis of practices of cooperation, I do not mean to suggest that established residents impose such practices only because it is useful for managing the drinking water system. Rather, I think that the efforts of established residents fit within a broader web of principles, values, and practices that they use to orient their lives. Similar principles of reciprocity shape a variety of personal relationships such as kinship relations, friendships, compadrazgo relations, meals, and public and private fiestas. The origin of this sort of unity is unknown, but some of this reciprocity may have arisen in opposition to various pressures to organize their lives differently. In this regard, I think that some of the actions are related to the deployment of productive power, which disciplines people as they participate in cooperative activities, such as cargos, faenas, and fiestas. Los Purifiqueños refer to the notion of "living with" (convivir) someone (e.g., being a good neighbor), and that this sort of living entails bonds and reciprocity that enter into other domains of life. In this sense, practices of cooperation are not valued because they are useful for managing drinking water; rather, I think that because they are valued they enter into drinking water management.

Unequal Water Distribution

Community officials recognized that not every citizen necessarily should have the same labor obligations.

Community officials exempted people from some obligations if they lacked sufficient access to drinking water. When authorities attempted to provide a "level" distribution of drinking water, they strived to ensure that each household received a fair amount of drinking water. In other words, water distribution was not entirely even, especially due to an uneven geography. Obvious social and geographical differences made it difficult for authorities to expect some residents to pay the same fees and fulfill the same labor obligations.

The largest pipes of the water system were installed in the central section of the community nucleus and drain water toward households at lower elevations. During my fieldwork, households at higher elevations in Barrio de Santa Teresa Norte usually received water for about two hours every day, but households at the lower elevations in Barrio de Santa Teresa Sur received up to six hours or more every day. By contrast, households in high elevations of Barrio de La Concepción Norte barely received two hours of water every other day, and some households at the highest elevations received even less water. Barrio de La Concepción Norte is the farthest section of the community from the water pump and large water tanks, and it has metal and rubber pipes with smaller diameters that were installed years after the community initiated the piped drinking water project. In the colonia, one section near a water tank received water

each day, but the other section rotated water between two parts, each part receiving water every other day.

The unequal distribution of drinking water resulted from several factors. Primarily, the initial installation of the drinking water system began in the center of the community in Barrio de Santa Teresa Norte and Barrio de Santa Teresa Sur, the western half of the settlement and closest to the ejido. According to some previous water authorities, large water pipes were installed in these western barrios in order to deliver large quantities of irrigation water. The earliest plans intended to reduce the portion of surface water for the western barrios and replace the surface water with groundwater pumped up from the well in the ejido. This plan was to allow the eastern half of the settlement (Barrio de La Concepción Norte and Barrio de La Concepción Sur) to rely on a greater volume of surface water for irrigation and domestic purposes. Thus, the earliest projects installed the first two tanks above Barrio de Santa Teresa Norte and large water pipes in Barrio de Santa Teresa Norte and Barrio de Santa Teresa Sur, which resulted in draining large volumes of water to lower elevations. Authorities also said that efforts to install water meters have been difficult and costly, especially because the use of gravity to channel water in the system creates more pressure than standard water meters can withstand. As I explained in the previous chapter, the

community decided later to use groundwater for domestic use for the entire community and surface water for irrigation.

During my fieldwork, residents complained about drinking water draining away from households located at higher elevations (particularly from Barrio de la Concepción Norte) to lower elevations in Barrio de Santa Teresa Sur. People commonly complained about this inequality, but it was difficult and costly to replace water pipes and install valves to channel water to higher elevations. Authorities also said that once one part of the settlement began receiving adequate water supplies, it was difficult to organize residents to work in faenas designed to develop the drinking water system in the other sections of the community.

In some cases, households claimed that they did not receive a sufficient water supply and would not pay their water fees. Authorities who made eyewitness inspections usually proved that sufficient water reached these households -- it just may not have been the quantity, the length of time, or the time of day that people in the household had wished. Water authorities are long-term residents and have extensive knowledge about the flow of water within the community. They know what sections of the community receive sufficient quantities of water and what sections do not. Officials readily talk to friends and relatives in any part of the community to see if sufficient water reaches households located next to people who claim to

have problems with water delivery. This allows authorities to judge whether problems are confined to a particular household (e.g., due to a damaged pipe or connection) or if the problems involve pipes that supply several households. I observed many cases in which authorities decided that a person was making a false claim to get more than their fair share of water.

In interviews with me, community officials pointed out that it was an advantage to have local residents manage the drinking water system. As established residents, they became aware of problems much faster than would have been the case if they relied on an outside entity to manage their drinking water system. Officials gained authority because of their knowledge of the water system and problems with water delivery. The community elected people from each half of the settlement to serve on the drinking water committee, which balanced the knowledge of and experience with water distribution and water problems. For example, authorities with whom I worked drew on their knowledge of the history of water development, the geography of water pipes and valves, the names of properties and their owners, customary ways of organizing faena labor, and traditions of water control rooted in a history of irrigation management. They used their social knowledge to carry out a fair distribution of drinking water.

The 1994-1996 drinking water committee included residents from households in Barrio de La Concepción Norte.

These officials were aware of the ongoing problems with drinking water delivery. Consequently, residents from households with water problems occupied positions of authority to mobilize resources and deal with some of the problems. They knew, for example, when water had not reached their own households, so they could immediately assess whether the problem resulted from a broken pipe, the improper adjustment of a water valve, or failure to turn on the water pump at the required time to create enough pressure to carry water to the far eastern portion of the settlement. When other residents complained to officials about inadequate water delivery, the officials were the first to point out that they had not received water to bathe that morning and that they were working on the problem to the best of their ability.

Committee members also regularly encountered neighbors from Barrio de La Concepción Norte who complained about water problems, and sometimes the officers joked with their neighbors that their names were next on the roster (rol), and that they would be elected to a cargo and have the opportunity to see how easily they might deal with the water problems. During my fieldwork, some of the residents in Barrio de La Concepción Norte negotiated lower water fees and did not pay for some months when water did not reach their houses, but they were also obligated to provide leadership and labor to help improve water delivery to their households. These are examples of households using their

close ties to local organizational power of the water authorities to make changes in how water was delivered to their households.

Debt and Debtors

The local conception of rights and obligations was reflected in the ways residents talked about "debtors" (morosos). Officials regularly identified residents who received adequate water but who did not fulfill their obligations to contribute money and labor for community projects. Los Purifiqueños used the term moroso to refer to people who had not paid their water fees. This was especially evident during a two-week period in 1995 when the community's water supply was suspended after the electric company shut off electricity to run the water pump. Mexico's economic crisis made it difficult for many residents to pay water fees, leaving the drinking water committee without sufficient funds to pay electric fees to run the community's water pump. Residents understood the difficulty everyone had with the crisis, but they referred to households that owed more than one year of water fees as "debtors" (morosos), "slow payers" (gente morosa), and "lazy" or "negligent" (desidioso).

Such terms refer to debts involving money as well as debts involving participation in collective life, and contrast with the notion of cooperación. Community residents commonly referred to people who did not contribute

to cooperative labor projects as "debtors" (morosos) as well as "parasites" (parásitos) and "selfish" (egoísta). The same terms were also applied to people who refused to fulfill service in a civil or religious cargo. In this sense, people were referring to a person's social debt. Debt was not simply a monetary issue, but one that involved social obligations to the larger community. Established residents resisted attempts by new residents without previous ties to the community to focus only on monetary obligations to pay for water. In urban areas, money masked social relations regarding drinking water management, but residents in La Purificación regarded water debts as social debts.

Shutting Off Water Supplies

Community authorities maintained the right to shut off drinking water ("cortar el agua potable") from debtors who failed to fulfill community obligations, especially failure to complete civil or religious cargo service. In community assemblies and in encounters in civil offices, community residents, including former officer holders, pressured civil authorities to apply such sanctions to "debtors." The imposition of the sanction involves physically severing a household's water connection from the main water lines. Authorities also ask neighbors not to give water to the household.

During my stay in La Purificación, I often heard people request that authorities shut off a debtor's drinking water, but I rarely observed the application of this sanction. One reason is that most people seemed to comply with major obligations, so there was little need to apply the sanction. Also, unlike urban facilities, household water connections in La Purificación do not have valves and meters that authorities can turn off and lock. Authorities physically have to sever a household's water connection and remove pipes that lead to the main water network. This process is difficult, costly, and, as I point out below, legally risky for the community. When authorities did shut off drinking water connections, they tended to target a few households as a way to send a quick message for others to comply. Such examples showed other residents that the threat of this sanction was a real possibility.

I followed up on cases from years past to examine the complicated application of this sanction. After having their drinking water shut off, people have used the legal system to argue that community authorities were committing a crime. According to federal law, drinking water from underground sources is national property, and access to water is listed as a constitutional guarantee for all Mexican citizens (Leyes y Códigos de México 1994a, 1994b). Lawyers have counseled local authorities that, when they shut off a household's drinking water, they risked being criminally charged with the crime of "abuse of power."

Municipio of Texcoco authorities have arrested community authorities and put them in jail for a few days in Texcoco for this crime. Such cases appear to have involved local authorities pressuring individuals to conform to community customs not related directly to drinking water obligations, such as shutting off drinking water for someone who refused to fulfill mayordomía service. Community officials said that Texcoco authorities have tended to allow the community to shut off a household's drinking water supply if the household had a substantial monetary debt involving its drinking water account. In fact, according to officials in Texcoco, city officials did the same thing. Lawyers have suggested to authorities in La Purificación that, rather than completely shutting off water, they ought to restrict water "to a trickle" (por goteo) to allow the household a minimum amount of drinking water for vital needs and to comply with minimum legal standards. Lawyers have suggested that authorities do this even in cases of people who owed several years of water fees.

My observations of several cases of water shut offs also indicate the complexity of applying this sanction. In 1996, I observed several cases of authorities shutting off drinking water of people with two or more years of not paying drinking water fees. This involved sending several written notices to households stating that they risked having their water shut off, and it involved summoning debtors to the delegación to inform them of the problem.

Sometimes authorities went to debtor households as a group of eight to ten men comprising delegados, representatives from the drinking water committee and other civil committees, representatives from the ejido, and plumbers. Other times, male and female representatives of the mayordomias and from the voluntary citizen's drinking water commission joined the civil authorities. When the entire group arrived at several households, group members informed household members that they were delinquent on their water payments and that the group would be shutting off the household's drinking water supply. In a few instances, debtors gave officials money to cover part of the water debt and promised to pay the balance within a specified time. In most instances, however, the group dug up the water line, used a hacksaw to sever the intake water pipe leading to the household, and installed a clamp on the water connection. Authorities notified household members that they could receive water after they paid for past due water fees and for the materials and the labor of the plumber to shut off and reconnect the water supply. The imposition of sanctions seemed to be effective because most debtor households promptly paid their debts. Other debtors, upon hearing about these cases, also arrived at civil offices to pay debts and avoid the imposition of sanctions.

Summary

This chapter focuses on local concerns about providing a fair distribution of drinking water to residents of La Purificación. I refer to this as "leveling" the water because established residents contended that drinking water rights and obligations were supposed to be parejo, that is, "level," "even," "fair," and "just." Water is a vital but difficult resource to secure on an individual basis in this geographical and social setting. Conceivably, people could construct a variety of ways of obtaining adequate surface water and underground water, both to make a living and for household consumption. In fact, the history of water control in the region suggests that there are competing ways of providing people with water for household consumption.

In La Purificación, a set of cooperative and coercive practices have emerged in relation to managing drinking water as a communal resource. Authorities distributed a sufficient minimum amount of drinking water to all households and expected residents to pay money as well as contribute labor in the form of cargo service, faenas, smaller cargo service, fiesta participation, and other forms of mutual aid. This is related to power struggles over local policies (e.g., differential categories for water connection and monthly fees) and practices (e.g., sanctions, a cargo roster) that looked new but that many residents regarded as consistent with traditional views of water as a communal resource. Life in La Purificación has been changed

by influences of a market economy, in-migration, population increases, and a growing importance on water for household consumption rather than for irrigation. Nonmarket mechanisms (e.g., kinship and residency status), however, mediate drinking water distribution and limit, somewhat, the pressure to use market-based distribution principles that supply people with water based on their ability to pay money for the amounts consumed.

Community control of drinking water has concentrated power in a few individuals who can obligate other community residents to engage in an assortment of customary activities. For many residents, the benefit of a fair distribution of drinking water offsets, in part, the coercive effects of drinking water management. Many residents appeared to abide by community customs and relinquished some individual autonomy as long as they and their family members received a fair share of community resources. Residents seemed to tolerate inequalities in water distribution if they were due to geographical and technical factors and not the result of a few people purposefully benefitting at the expense of others. People lived with the natural and technical disparities, but, as I explore in the next chapter, los Purifiqueños worked hard to identify and address social inequities that brought about unnecessary forms of water-related suffering.

Chapter 7

SUFFERING FROM WATER

One day, I visited my friend Carmen and shared the midday meal with her family. During the meal, Carmen described to her family some questions that I had asked her a few days before. Laughing in a tone that was part mocking and part disbelief, she explained that I had asked her the meaning of the phrase "to suffer from water" (sufrir del agua). Carmen asked her family "Can you believe that he doesn't know what that means"? Similarly, when I asked Iris, another friend, about the phrase, she shook her head, laughed, and said that I would not know because I had probably never suffered from water. For Carmen, Iris and many others, the phrase "suffering from water" referred to something so obvious that it required little explanation.

I heard many people over the course of my research refer to their "suffering from water," especially during periods of water shortages. The phrase caught my attention because it expressed a form of bodily distress associated with drinking water scarcity. At first, I was unclear about the phrase and questioned people about its grammar and

usage. After some exploration, I learned that other community residents were not always clear about the phrase's meaning, and, contrary to what Carmen implied, not everyone had the same understanding of "suffering from water."

In this chapter, I analyze suffering from water as a central aspect of drinking water politics in La Purificación. I examine ways that bodily experience influences local drinking water management. Suffering shaped, as it was shaped by, central structures, practices, and values embedded in the community-managed drinking water system. Most often, los Purifiqueños used the local idiom "suffering from water" to express a collective bodily distress due to water scarcity and to identify and denounce the social and political origins of that distress.

Carmen's Views of Suffering from Water

Carmen's views of suffering from water are similar to those of many established residents who hold cargo offices and occupy the upper-middle socioeconomic stratum of the community. Her views, however, also reflect local differences based on socioeconomic status, residency status, and gender. When I asked Carmen about the meaning of the phrase "suffering from water," she responded, after some initial surprise, by saying that:

> We suffer from having to struggle and having to run around paying for water from water trucks, or when we don't have sufficient water for our necessities . . . like for bathing, for washing clothes . . . . This is

> suffering, because, [during water shortage], just like before [we had the piped water system], we have to carry clothes over to the river by Molino de Flores, our clothes. I have a little car, and I take [laundry] in the car, and we wash over there [at the river]. All of this we call suffering from water, because we don't have our water in the house, no water to fill buckets, not enough water even to bathe each week, so for me this is a terrible suffering . . . carrying our water in pots and buckets. And when I want to bathe, really it is draining, how one suffers . . . .

Carmen was born in La Purificación in the 1940s and has resided in the community all her life. Her deceased father was an established resident, and her mother is from another state. Carmen grew up in family that made a living with a mixture of wage labor and limited subsistence agriculture. They lived in the community nucleus on irrigated huerta land of more than 3,000 square meters in size. Her father was not an ejidatario, but she had relatives who were. Carmen completed primary school in La Purificación. Carmen's father divided the family's huerta land among his adult children so that they had places to settle after becoming married. Carmen married a man from the community, and they built a one-story house on a portion of her father's property that he sold her.

During my fieldwork, the family property had four main households and two younger couples waiting to build their own houses on the property. The families consisted of about 20 people total. Although they live in separate households, the families pool resources for some activities, such as buying food and sharing a common kitchen where Carmen's

mother coordinates meals most days for everyone. Carmen lives with her three daughters, and one of the daughters is building an additional room to live with her fiance. Another house includes Carmen's mother, Carmen's sister and her children, and Carmen's son, his wife, and their child. Carmen's two brothers, their wives, and their children live in two other houses. Carmen and her husband raised two daughters and a son, and Carmen is raising a young niece whose mother, Carmen's sister, died. Carmen refers to the girl as her daughter. When I conducted my fieldwork, Carmen and her husband had been separated for several years, and he resided in another house in the community.

Although Carmen's family calls themselves campesinos, the households do not rely on agricultural production. Most of the huerta land has been converted into smaller plots for residential use, and Carmen's family no longer receives a portion of irrigation water. They eat fruit from a few remaining apple and peach trees. When I asked Carmen what was her occupation, she said "the home" (el hogar) because she takes care of the household and is supported, in part, by her adult daughters. She also sometimes sews garments on a piece-work basis for a merchant in the region. Before getting married, she worked in a garment factory in Mexico City for seven years. Her sister works in a garment factory in Chiconcuac, one brother works as a guard at the Texcoco prison, and the other brother works as a technician at a nearby agricultural institution. During my fieldwork,

Carmen and her sister discussed plans to rent a small restaurant located near the prison to prepare and sell food to prison employees and visitors. Carmen's children have begun careers as business and legal professionals, and her nieces and nephews are attending postsecondary schools.

Carmen owns the plot of land (about 300 square meters) on which her house is located. Her modest one-story house was built with cement blocks, glass windows, and a cement floor and roof, and, in the last few years, she has added a second story of rooms for her children. The house has electricity and telephone service, and she owns two televisions and a car. Carmen's house has its own drinking water connection, separate from the drinking water connections of the other houses on the property. Carmen said her household drinking water connection is registered in her name and not her husband's because she bought the property from her father and pays for the household expenses. The house has a system for draining wastewater from the indoor bathroom and indoor sinks into a septic tank, but grey water from the laundry drains onto the property.

As with most houses in the community, Carmen's house does not have a cistern, but it has a rooftop tank (with a capacity of 500 liters). Carmen's household also regularly fills a few plastic buckets (25 liters each) with water. In addition, Carmen also does laundry and washes dishes in an outside pileta (with a capacity of 2,000 liters) that she

shares with the other households on the family property. Thus, her household has the capacity to store over 500 liters of water a day (plus the water in the pileta) for herself and her three daughters living in the house. This provides over 125 liters/person/day of stored water, plus the water they use while it is actually running at the house. Carmen said they usually were able to fill water reservoirs each day during the two hours that they received water (usually from 9:00 A.M. to 11:00 A.M.). Carmen said that while they fill the water reservoirs they also do laundry. In this manner, she said, they have plenty of water stored at later times for bathing and cooking.

I asked Carmen if she was concerned about the quality of the drinking water, and she said, "No," but quickly added that she was more worried that the groundwater was becoming depleted (agotando) (i.e., the water table was falling) and that the equipment to pump water to households was breaking down. Carmen said she could not recall any family health problem from drinking the water. Carmen said that she and her family members usually drank water directly from the tap, and sometimes (but rarely) they boiled water before drinking it. I asked Carmen if she used irrigation water for domestic purposes, and she said she grew up drinking the irrigation water, but she said she would no longer do so because the irrigation water had become "dirty" (sucia) from people throwing garbage and sewage into the irrigation canals.

Carmen has been active in community affairs, especially during my fieldwork. Over the years, she has been on the education committees for the kindergarten and the primary school. During the 1995-1996 academic year, while her youngest daughter attended primary school, Carmen was the president of the parents' association at the primary school. In 1973, after purchasing her house, she and her husband were given a cargo in a mayordomía, and, 23 years later, in 1996, her household appeared on the cargo roster again and she was elected as a fiscala; one of her brothers was elected a fiscal. Together they headed one of the mayordomías. The other brother was elected a mayordomo, and all the members of the four households worked to sponsor and organize fiestas for the year. Carmen, her family members, and neighbors who were named to religious cargos, however, only agreed to accept the cargos as long as civil authorities also agreed to pressure others to accept mayordomías in the future by threatening to impose sanctions on them (including shutting off their drinking water). She also volunteered to be on the drinking water commission in 1995 and 1996, and went house to house several times to ask other residents to pay their household drinking water debts.

Carmen is critical of people who do not "cooperate with the community" (cooperar con la comunidad) by performing community labor in the form of faenas and civil and religious cargo service. She said that "to have these rights [to water] you have to contribute" to the community.

She continued that "people pay [money] for one month of water but they don't do their work." She pointed out that the water fees are relatively low. She explained that ordering a water truck (pipa) from Texcoco would cost about $80-100 pesos and the 900 liters of water would not last a week. In La Purificación, by contrast, households pay a monthly fee of $25 pesos and receive running water every day, so people should also provide labor for community projects. In fact, going house to house during visits of the water commission, I heard Carmen and her aunt explain to debtors that the drinking water cost a household less than $1 peso a day. She often commented to people that they wasted more than $1 peso a day buying other things, and that women spent more on makeup and men, on alcoholic beverages.

At community assemblies in 1995, Carmen was active in pressuring civil authorities to shut off water of debtor households, and she went to the delegación several times to urge civil officials to mobilize the water commission for another weekend and pressure debtors. Later, in 1996, when she occupied a religious cargo, she supported efforts to have civil and religious officials work together to shut off water of people (especially wealthier residents) who did not fulfill their mayordomía obligations. She said that:

> There are people with resources, with large houses, which probably have more water because, if you have noticed, they have [ornamental] gardens, patios, and cars that they wash with drinking water, right? Then precisely these people are the ones that have not wanted to collaborate (colaborar) by doing their

> mayordomía . . . . We don't have any other measure except [to shut off] the water, which is the life here of the pueblo.

I asked Carmen why she supported efforts to have civil officials shut off water to pressure people to fulfill obligations related to religious cargos. She explained that it was important for all the authorities to be "united" (unido). Carmen reminded me that her grandparents, parents, aunts, and uncles had worked together in a united fashion to establish the kindergarten and primary school, build the new road, and install the drinking water system. In fact, her father and uncles were some of the group leaders who organized the road project and later the installation of the drinking water system. She suggested that I collect information on the history of these efforts, which she characterized as "heroic" (heróico) because her relatives had to confront powerful families of the upper stratum in the community as well as petition the government for funds and technical assistance. These efforts, she said, required the whole community to work together, which is also why mayordomos and delegados should continue to work together to deal with drinking water issues. In her view, this unity was how the community initially had obtained resources for the drinking water system as well as for many other projects, which she listed: the soccer field; irrigation water; ejido improvements; and a milk distribution program for lower-income households with support from the Partido

Revolucionario Institucional (PRI) and PRONASOL. In Carmen's view, everyone should work as a single team (un solo equipo), just as they do to hold dances, organize religious processions, and respond to the church bell in the case of emergencies. "It is one branch," (una sola rama) she said, emphasizing that unity helps to sustain community life.

What Does Suffering from Water Mean?

I heard many community residents of La Purificación refer to suffering from water in relation to local problems with water quantity and distribution. As I explain in the previous chapter, most households expected to receive piped water for two to four hours at least every other morning. When they did not receive adequate water supplies, they complained to the local water authorities that they were "suffering from water" and demanded to know whether it was a temporary technical problem or in fact a social injustice that had prevented them from receiving their fair share of drinking water. The mountainous terrain and the aging equipment have produced technical problems: gravity pulls water to households at lower elevations, the water pump breaks down, the electricity goes out, and water pipes and hoses break and get plugged. However, people knew that some residents have intentionally tampered with water valves and pipes, that households at lower elevations have left water faucets open to fill large water tanks, that some households

have pumped water to use in ornamental and commercial gardening, and that civil authorities have changed the water schedule to favor particular areas of the community.

During my observations in the civil offices, I often heard community residents discuss their suffering before water authorities. I asked Carlos, one of the locally-elected water officials, what suffering from water means, and he explained:

> I can suffer in the sense that I don't have the service for the most indispensable things . . . such as for preparing the food and for, well, for drinking. For bathing, if you have irrigation water, well you can use that. And one suffers about their allotted supply not arriving, that amount requested of, let's say, 50 liters per person, and it doesn't arrive. We have seen families with five people who are supplied with a metal drum of 200 liters every other day. Now, with the amount, it would be about 40 liters per person [every other day], no? But, it would be half, 20 liters, daily, while other people have double or triple or more. This would be suffering, to not have water AND being obligated to pay for it, you know, hoping that the water will arrive. . . . [Then] this would be suffering, more than anything moral [suffering], to see that [my neighbor] has it and I don't have it.

Like Carlos, many residents explained that they suffer when they have inadequate water supplies for daily needs. It was common for people to note that they had little water, sometimes less than the 25 to 50 liters/person/day recommended by the World Health Organization (cited in Flores 1995; García Lascuráin 1995). People talked about suffering <u>from</u> water and <u>about</u> water when they had to wait for the arrival of water, ration the use of water in the household, carry and store water, pay for water, and

contribute limited time, money, and physical labor to community water projects. People also described a bodily discomfort they and their family members felt when they could not bathe for days, could not wash dirty clothes, dishes, and toilets, carried laundry to wash in a river or other places, and bothered neighbors, friends, and kin with requests for water.

In addition, people with inadequate water said they were suffering when they saw others with more water and others using drinking water in inappropriate ways. Community residents who saw others with more water described their bodily distress with terms such as "frustration" (frustración), "anguish" (angustia), "bother" (molestia), "worry" (preocupación), and "anger" (coraje). To their mind, it was unjust to receive inadequate amounts of water, pay the same monthly water fees, and fulfill the same annual labor obligations as other community members who enjoyed greater amounts of water.

This local discourse on the moral and physical aspects of suffering motivated some people to identify and confront the injustice of that suffering. This was especially true for people of lower socioeconomic strata who usually did not have the means of storing large quantities of water in large reservoirs and who could not afford to pay trucks to deliver water to their houses. This prompted some people to ask whether the problem had a social origin within the community and thus violated the principle that residents who fulfilled

obligations could expect to receive a fair share of drinking water. When this was the case, people took action to correct it. When it was due to a technical problem, they still pressured authorities to address the issue, but people were more tolerant of technical problems associated with the ongoing process of developing a drinking water system.

Who is Suffering From Water?

Most community members were aware of and concerned about water scarcity in the community and the Valley of Mexico. Not all residents, however, related the changing ecology of water use to bodily distress. People most often articulated suffering as a collective experience. As Carmen said, "We suffer from water." At times, however, people used "we" to refer to groups differing with regard to socioeconomic status, residency status, and gender.

Numerous conflicts relate to economic differences. Many professionals and others of the upper socioeconomic stratum live in large houses with large cisterns, which allow them to weather temporary disruptions in water. They tended not to use the idiom "suffering from water," and in interviews some said they had not heard of the phrase or characterized it as bad grammar. Residents of the lower-middle and lower strata were more likely to discuss their suffering from water, especially since they did not have large reservoirs and depended on receiving daily supplies of water.

These experiences of suffering based on economic differences were also influenced by residency status. As I note in the previous chapter, there were onging conflicts between established residents and new residents over drinking water. In public encounters, established residents often stated that they, as a community, were suffering from water and that they needed to unite as a community to solve the problem. In these discussions, established residents often reminded listeners (especially new residents) that, before the 1970s, they were a "peasant" (campesino) community. After the 1970s, the community witnessed an in-migration of new people and the population has increased. Established residents often pointed out that new residents abuse their privileges by not contributing money or labor to community water projects and at the same time put more demands on the water system. Males especially contended that they had labored and suffered in the 1970s when they installed a piped drinking water system that tapped a cleaner and more reliable underground source. The experience of developing and protecting a communal resource has led established residents to create differential policies and practices based on residency status.

Of course, new residents pointed to the supposedly backward and authoritarian manner that community residents ran the drinking water system, and they said they paid money for a service that was inefficiently run and not delivered to neighborhoods where new residents settled. New residents

suggested in community meetings and other encounters that it would be better to have an outside governmental authority run the water system, something that established residents have generally opposed.

The conflicts between established residents and new residents provide examples of men and women united on drinking water management. An analysis of diverging gender interests, however, shows that women are more likely than men to say they suffer from water. As Carmen told me:

> . . . [I]f we would realize, water probably interests us [women] more [than men] because we use it in everything, yes for everything. The man doesn't care. He just takes a bath and leaves and that's it. And not so with the woman, because the woman knows that everything, everything, everything in life that she does in the house is about water, is done with water. If we're going to bathe, if we're going to wash our hands, if we are going to wash a diaper, if we are going to prepare some tea, if we are going to wash a baby's bottle, everything, everything, everything is the responsibility of the woman.

Women had the responsibility and interest to ensure that water reaches their households, and when it did not, they took action. Women have not been elected as water authorities, but they often confronted male office holders (including their kin) and influenced the course of water development and management. Women vocalized their suffering at the civil offices, community meetings, and in social gatherings. Women notified male water authorities of water problems, they fulfilled labor obligations on water projects, and, in contrast to irrigation management, women

often registered the household's drinking water account in their names and paid the monthly water fees. Women were also active in forming a voluntary water commission that went house to house to threaten or actually shut off water of residents with large water debts.

Table 7.1 shows a tendency for a greater number and percentage of women to register the household's water connections (tomas) in their name. It increased from 16 women (16% of total tomas) in 1980 to 257 women (30% of total tomas) in 1996. Some women were considered the head of the household, usually because they were unmarried, divorced, or widowed women with children, and the toma was originally in a man's name but was transferred to the woman's name. Many of the women had been born in the community (but their husbands had not), so they were eligible to request a lower fee to obtain a drinking water connection for their household. Other cases included daughters who had inherited the toma from their parents.

Views of Water Quality

People referred to suffering from water as a form of pain, anxiety, and bodily discomfort. The suffering had a physical component, but it also had a social origin because sufferers sought to identify people who had probably caused the suffering by impeding an adequate distribution of drinking water. In this way, suffering from water was not a local illness category needing medical intervention,

Table 7.1 Men and Women with Registered Tomas[a]

Year	Number (and %) of Men with Registered Tomas	Number (and %) of Women with Registered Tomas
1980	84 (84%)	16 (16%)
1981	140 (81%)	32 (19%)
1982	199 (77%)	58 (23%)
1983	224 (76%)	72 (24%)
1984	288 (75%)	96 (25%)
1985[b]	---	---
1986	---	---
1987	---	---
1988	382 (74%)	132 (26%)
1989	432 (73%)	157 (27%)
1990	432 (74%)	153 (26%)
1991	436 (71%)	177 (29%)
1992	509 (72%)	194 (28%)
1993	570 (71%)	231 (29%)
1994	602 (72%)	233 (28%)
1995	591 (70%)	253 (30%)
1996[c]	608 (70%)	257 (30%)

Source: Account books from the Comité de Agua Potable, Delegación Municipal, La Purificación Tepetitla, Municipio de Texcoco, Estado de México.

[a] A toma is the household connection to the drinking water system.

[b] The account books from the 1985-1987 civil administration were unavailable for analysis.

[c] The data for 1996 were taken only for the months of January to May.

traditional or otherwise. To alleviate suffering, people suggested the need to identify and address the social causes that hindered a fair and adequate distribution of drinking water to all households and generated suffering from water.

Local Views of Water Quality

Residents, in general, did not associate this form of suffering with compromised water quality. Residents seemed to base their views of drinking water quality on their health, which they perceived as good, and on the physical qualities of the water, such as its color, smell, and taste. Community residents suggested, for example, that the community's drinking water supply was relatively "clean" (limpia), "pure" (pura), and "healthy" (sana), especially when compared to surface water from irrigation ditches or treated water from water trucks. As one woman told me, "We have never had an epidemic." People said the water looked pure and lacked visible signs of pollution. In interviews, nobody reported that they had gotten sick from the drinking water. Most authorities I interviewed reported that they did not purify their drinking water before consuming it, although some pointed out that they were probably supposed to purify their drinking water according to national health education messages they had heard on television and radio.

People informally monitored the quality of both surface water and underground water, but there were no routine formal mechanisms for conducting biochemical tests of the

water. Established residents said that surface water for irrigation had become more visibly polluted than in previous decades. They did not recall health problems from drinking irrigation water in the past, but now most people avoided drinking the irrigation water even if they used it for other domestic purposes (e.g., bathing, laundry). Recall that water travels from mountain springs and passes through sierra communities in open-air canals before a portion is channeled to La Purificación for irrigation. Residents said they had seen people in sierra communities put garbage into irrigation canals, wash laundry and bathe in the canals, and allow animals in the canals. One day I accompanied irrigation officials when they cleaned out grates designed to filter solid waste from the surface water before it entered pipes and canals leading to La Purificación's irrigation system. The waste from other communities included plastic bags, plastic bottles and other containers, glass containers, plastic plates, juice cartons, plastic straws, and disposable diapers.

Within La Purificación, it is becoming more common for households to discharge wastewater (both "gray water," i.e., discharged water after doing laundry, and "black water," i.e., sewage) into irrigation canals and roadside ditches. One aguador (the person who actually distributes irrigation water) said that he wanted to avoid contact with the polluted irrigation water and had begun wearing rubber boots when he had to walk in irrigation canals to clear them of

debris. Another aguador told me that in previous decades the aguador had almost a "sacred" (sagrado) position in the community, and people respected his requests to not put garbage and wastewater into the irrigation canals (especially since people used to rely on the same water for household consumption). The person suggested, however, that in the past few decades, people have begun showing less respect for the prohibitions against polluting the irrigation water. Others told me about decades past when they thought nothing of drinking water directly from the irrigation canals, something that they would no longer do for fear of becoming sick. The growing local concern for polluted irrigation water led, in part, to the tapping of underground water sources for domestic purposes.

Regarding the quality of underground water, there is no regular official monitoring of the water quality, but generally people regarded the water as clean and safe for drinking. Some officials, however, after seeing how water travels through the system, said that they had become more concerned about the quality of the drinking water. Authorities said they had found water pipes plugged with garbage, pieces of cloth, organic matter, and dead animal parts. Officials also said they had become concerned while cleaning the drinking water system. There is not much cleaning of the water system, and chlorine is not added to the water. Once a year, however, officials coordinate an annual faena to clean the drinking water system on the

Saturday before Easter (El Sábado de Gloria). On this day, in many parts of Mexico, people have the custom of splashing others with water, which some people regard as a game and joke and others describe as an annoyance. People in La Purificación said, laughing, that they did it because it was the custom to give people a bath on this day. Two sierra communities, San Jerónimo Amanalco and Santa Catarina del Monte, have turned this custom into a tourist attraction and invite people during the Easter season to visit mountain springs to splash in the water and have picnics. Officials in La Purificación have been concerned, however, that practicing this custom in their community would waste scarce water supplies, so officials in La Purificación initiated the custom of shutting off the entire drinking water system of the community on that Saturday and using the opportunity to clean the drinking water system. In 1996, for example, officials called a faena to clean the three water tanks on that Saturday morning. A group of neighbors cleaned each tank with bleach and brooms and allowed the bleached water to flush through the whole system. People commented on the dirty appearance of the water in the large water tanks, and they suggested that the drinking water may be polluted. Cleaning these tanks offers residents one of the few moments to physically see polluted drinking water, something that seems less apparent once the water reaches the household and comes out of the faucets.

Walking around the community, I readily found water pipes and rubber hoses with openings surrounded by impurities that could have entered the system. This problem is compounded by the fact that many pipes and hoses for drinking water run in irrigation canals, which would allow polluted water to enter the drinking water system. Many households discharge grey water and sewage water onto their properties (e.g., in gardens), irrigation canals, and streets. Drinking water pipes and hoses that run above ground are exposed to this wastewater.

Officials explained that sewage disposal has become a bigger problem because more people (especially from lower socioeconomic strata) have built houses on small plots of land (less than 250 square meters) that do not have septic tanks or enough agricultural land to absorb wastewater. Community officials expressed ambivalence about installing a community sewage system. During my fieldwork, officials consulted with a few municipal engineers regarding the installation of a public sewage system, but it would have been a costly project. Officials said that many residents were concerned about the health risks posed by sewage discharge, but a sewage and drainage system might drain away too much water (from irrigation, rain, and household sources) that is now used to water gardens. Resident said that people admired the community's abundant vegetation that, to their minds, has been maintained because people have discharged wastewater onto their properties.

Resolutions passed at community assemblies state that properties should be sold as plots of 1,000 square meters or more. One official told me that these resolutions were designed to make sure new property owners had sufficient land to discharge wastewater. Further, people hoped it would preserve the "provincial" quality of the community and curb the in-migration of new residents. Officials remarked, however, that the policies have not worked and people have been selling small plots of land at profitable prices.

Biomedical Views of Water Quality

In contrast to local views, public health initiatives have focused on biomedical issues regarding suffering caused by unhealthy water quality. Physicians and public health workers in the Texcoco region suggested that La Purificación's poor water quality put the community at risk for parasitic diseases and cholera. For example, Texcoco public health officials held a public forum on cholera and stressed the need for people in rural communities to learn proper preventative measures (e.g., boil water, wash hands, and avoid eating food from street vendors).

The Municipio of Texcoco has coordinated biochemical water testing for communities including La Purificación. Tables 7.2 and 7.3 show results of water quality tests of groundwater and surface water in La Purificación conducted in 1992 by biologists from the Instituto Politécnico Nacional in Mexico City. The tests appear to have been part

of a onetime water quality study sponsored by the Municipio of Texcoco for communities under its jurisdiction. Table 7.2 first lists the ideal drinking water standards recommended by Mexico's Secretaría de Salud (Secretary of Health) in terms of water hardness, ph, alkalinity, detergents, aerobic mesophyles, coliform bacteria, and suspended solids. Samples 1 to 4 were of groundwater from the drinking water system in La Purificación, and sample 5 was of a control (also groundwater) from the drinking water system of Texcoco. Table 7.3 also lists ideal recommended drinking water standards and compares the standards to water quality samples 6 to 9 of surface water used primarily for irrigation in La Purificación.

The report concluded that "Texcoco's drinking water [sample 5] conforms with established standards by the Secretaría de Salud (Secretary of Health), and is suitable for human consumption. The other samples do not conform to the standards, and are not suitable for human consumption."[67] In particular, the test results show that the community's groundwater and surface water did not meet public health standards regarding levels of disease-causing microorganisms that originated from human and animal fecal matter (i.e., coliform bacteria such as E. coli). Samples from the drinking water well (sample 1) and one water tank

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[67] ADM, Estudio del agua, Instituto Politécnico Nacional, Escuela Nacional de Ciencias Biológicas, Sección de Química Inorgánica, 23 de junio de 1992.

Table 7.2 Water Quality: Drinking Water Samples, 1992

Source: ADM, Estudio del agua, Instituto Politécnico Nacional, Escuela Nacional de Ciencias Biológicas, Sección de Química Inorgánica, 23 de junio de 1992.

[a] The table compares water quality samples of drinking water from La Purificación and Texcoco with the ideal drinking water standards recommended by Mexico's Secretary of Health (Secretaría de Salud). The "permissible" standards (less than "ideal") are as follows: water hardness 300-500 ppm; ph 6.5-9.2; alkalinity 400 ppm. There is no separate standard for coliform bacteria.

[b] Sample has coliform bacteria above acceptable levels.

Table 7.2 Water Quality: Drinking Water Samples, 1992

Sample	Water Hardness $CaCO_3$ (ppm)	ph	Total Alkalinity (ppm)	Detergents (ppm)	Aerobic mesophiles UFC/ml	Coliform bacteria UFC/ml	Suspended Solids
Recommended Standards[a]	100	7.0-8.5	0	0.5	200 UFC/ml max.	< 2.2 UFC/ml	
1. Main Well	171.40	7.7	0.16	0.02	1,500	< 2.2	Passes
2. Water Tank (Colonia)	152.36	7.8	0.17	0.07	1,000	> 16.0[b]	Passes
3. Water Tank (Santa Teresa)	133.32	7.5	0.15	0.00	1,500	< 2.2	Passes
4. Water Tank (Castillo)	190.46	7.7	0.16	0.04	2,000	> 16.0[b]	Passes
5. Drinking water in Texcoco	95.23	7.0	0.13	0.02	0	< 2.2	Passes

Table 7.3 Water Quality: Irrigation Water Samples, 1992

Source: ADM, Estudio del agua, Instituto Politécnico Nacional, Escuela Nacional de Ciencias Biológicas, Sección de Química Inorgánica, 23 de junio de 1992.

[a] The table compares water quality samples of irrigation water from La Purificación with the ideal drinking water standards recommended by Mexico's Secretary of Health (Secretaría de Salud). The "permissible" standards (less than "ideal") are as follows: water hardness 300-500 ppm; ph 6.5-9.2; alkalinity 400 ppm. There is no separate standard for coliform bacteria.

[b] Sample has coliform bacteria above acceptable levels.

Table 7.3 Water Quality: Irrigation Water Samples, 1992

Sample	Water Hardness $CaCO_3$ (ppm)	ph	Total Alkalinity (ppm)	Detergents (ppm)	Aerobic mesophiles UFC/ml	Coliform bacteria UFC/ml	Suspended Solids
Recommended Standards[a]	100	7.0-8.5	0	0.5	200 UFC/ml max.	< 2.2 UFC/ml	
6. Surface water near sierra spring	114.27	6.9	0.08	0.04	1,000	> 16.0[b]	Passes
7. Surface water at irrigation booth	76.18	6.9	0.08	0.17	700	> 16.0[b]	Passes
8. Surface water at irrigation tube	95.23	7.1	0.08	0.06	140	> 16.0[b]	Passes
9. Surface water at dam	133.32	6.9	0.08	0.02	900	> 16.0[b]	Passes

(sample 3) did not exceed acceptable levels of coliform bacteria. Samples from two of the three large water tanks (samples 2 and 4) and the irrigation water (samples 6 through 9) exceeded acceptable levels. These findings support statements by authorities in La Purificación who said that groundwater directly from the well is a clean drinking water source. After passing through the water delivery system, however, the water becomes polluted, something that is not generally recognized. In fact, the report indicates that the irrigation water (which some households use for domestic purposes) as well as much of the groundwater that reaches individual households exceed acceptable levels of contamination from disease-causing coliform bacteria.

The data indicate that after leaving the main drinking water well, groundwater in other parts of the system (e.g., water pipes, water tanks, household faucets) becomes polluted with disease-causing microbes. The water probably becomes polluted as it travels through the system, which is not self-contained. The large water tanks have openings, and many household connections have pipes and rubber hoses that leak water. Because officials turn the water pump on for about six hours a day, the system does not have positive pressure 24 hours a day. Turning the pump off creates negative pressure that draws impurities into openings in the water system.

Biomedical information about the polluted drinking water influences practices of the local physician who held community education discussions (pláticas) about the risks of parasites and diarrheal diseases in La Purificación. This included a discussion with about 25 adults (all women, except for one man) from the kindergarten's parents' association. The physician informed the participants that diarrheal diseases caused by parasites (e.g., Ascaris lumbricoides) were the major health problem in the Texcoco region. The physician recommended preventative measures such as boiling water for five minutes, adding bleach to drinking water, and washing hands. Health professionals tended to attribute water-related suffering in rural communities to local resistance to adopting modern medicinal standards and to "bad habits" such as improper hygiene and drinking impure water. One health care worker told me that every resident in La Purificación was infected with parasites from drinking the local drinking water, something the worker avoided.

For decades, La Purificación has obtained funds and technical assistance from public health programs, especially by Secretaría de Salubridad y Asistencia (SSA) and Comisión Estatal de Agua y Saneamiento CEAS), to install a piped system for delivering underground water to individual households. One of the large water tanks, for example, has a sign from SSA, and buildings adjacent to the delegación has a sign from CEAS and used to house public bathrooms and

laundry service for people who did not have an indoor water supply. The public health initiatives focused on installing piped water (agua entubada) as a strategy for improving people's access to healthier water supplies. Once accessed, it was up to individual households to purify their water.

Public health initiatives to alleviate suffering did not deal with issues of water quantity, management, and distribution. Government-paid local health workers, for example, did not work with the drinking water committee, and community health education programs, like the one at the kindergarten, tended to focus on women as family caregivers who ought to educate household members about proper hygiene and water purification measures. Such programs did not deal with the range of actions both men and women took to secure safe and reliable drinking water supplies for their families, such as performing cargo service, working on faenas, and organizing water commissions. Lastly, public health programs did not address the socioeconomic stratification that may lead to inequalities in access to drinking water.

Managing a Two-Week Water Shortage

The material above provides instances of people concerned about suffering from water on a daily basis. In the following section, I examine suffering from water in the context of a particular two-week water shortage. The materials illustrate ways residents conceived of and sought

to alleviate their suffering. This was a dramatic example of a more general pattern I observed in La Purificación.

The Beginning of the Water Shortage

On July 10, 1995, I arrived at the delegación, sat down to one side of the drinking water committee's desk, and opened my notebook to record observations and comments. I expected that, as usual, few people would be coming to the delegación on a Monday morning. After sitting down, however, I quickly discovered that it was the beginning of a busy two-week period when people, many of them women, would be telling officials, "We are suffering from water." Community residents complained (sometimes angrily) that they had no water for cooking, for getting children bathed and ready for school, or for washing clothes. "We don't even have a drop of water to drink," was a common expression I heard. Los Purifiqueños were suffering from water and they wanted to know what community authorities planned to do about it.

The community had no drinking water because the electric company (Melchor Ocampo, Luz y Fuerza del Centro from Mexico City) had suspended the electric service for the community's drinking water pump. Officials showed me five overdue electric bills totalling over $35,000 pesos (approx.

US$5,000).[68] The electric company had agreed to reconnect the power within a week of receiving an installment of $20,000 pesos, and it promised to give community officials an additional week to pay the balance before suspending electricity for the water pump again.

For several years, authorities had been aware of and troubled by the potential problem of paying higher electric bills to run the drinking water pump. In 1993, community representatives discovered that the federal government's rural reforms ended subsidies for electricity to operate irrigation pumps. La Purificación's drinking water well was officially registered as an irrigation pump, so losing this subsidy increased operation costs for the drinking water system. Newly elected community authorities in 1994 requested an increase in drinking water fees. The annual community assembly voted to increase monthly water fees from $10 pesos to $25 pesos, and to charge a onetime contribution of $110 pesos to fix a damaged water pump.

The increase in water fees anticipated the triple inflation of 1995, but, without corresponding wage increases, users had difficulty paying fees and many chose to delay paying drinking water fees. This problem was compounded by the fact that many households had the habit of

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[68] In the 1994, the exchange rate was about US$1.00 = $3.00 pesos. By the end of 1994, the economic crisis and the devaluation of the peso led to price fluctuations. The exchange rate leveled off to about US$1.00 = $6.00-7.00 pesos during most of my fieldwork (1995-1996).

paying for one year of water at the end of the year after they received year-end bonuses from their employers. When the economic crisis began at the end of 1994, many households had not paid for their 1994 consumption of drinking water. In 1995, the electric company increased its electric rates and the government raised the IVA tax from 10% to 15%, which resulted in almost tripling the cost of the electricity needed to operate the community's water pump. The decrease in funds by consumers and the increasing costs created a financial crisis for the drinking water committee.

Los Purifiqueños and many other Mexicans used the words "la situación" and "la crisis" to refer to Mexico's economic crisis brought on by the 1994 devaluation of the peso and subsequent rapid inflation, wage freezes, and unemployment. People regularly referred to the economic crisis as "hard" (duro), "difficult" (difícil), and "sad" (triste). La situación decreased people's abilities to pay water fees and complete community service and decreased the community's ability to obtain materials and pay the electric bills for the water pump. The crisis was intensified by the federal government's neoliberal reform policies that reduced government subsidies for rural development and other social welfare programs. It was this situation that led to an acute period of suffering from water for two weeks in La Purificación.

Encounters in the Delegación

When I sat down at the desk of the drinking water committee on the first day of the water shortage, I was greeted by the president and the treasurer of the drinking water committee, Carlos and Pablo, respectively. They were busy looking through account books to record the extent of each household's water debt. They were most engaged, however, in dealing with people expressing the suffering they were enduring because of the water shortage. Below, I present a few cases that I recorded during the beginning of the two-week water shortage.

For example, a woman, about 70 years old, approached the desk, sat down and said she wanted to pay her drinking water account. The woman said, "There's no water." The president explained that on Saturday, the electric company cut the electric power to the drinking water pumps, so there would not be any water in the pueblo. He said it was a big problem, and "How are they going to give us water if we don't pay here"? Other people approached the desk to listen to the interaction. The woman said that many people could not pay their water fees because they worked during the week and arrived home late at night. She suggested that authorities should have been going to debtors' houses on Sundays to collect water fees. Carlos said they had gone to people's houses, but people never seemed to be home. The woman laughed and said the people had probably hidden. Others around the desk laughed and agreed. Another man

spoke about the economic crisis and said, "It is difficult." Carlos agreed, "The situation is sad."

The woman said she wanted to be up to date in paying her water fees, but she could not pay everything that day. She remarked that she had lived 20 years in the colonia and had always paid her fees. Carlos asked her to tell others to come to pay their water fees. He explained that they would be announcing the problem by car with a megaphone and over the sound systems at the convent, the church, and the primary school. As he did with many other people during the water shortage, Carlos showed the woman five overdue bills from the electric company. Meanwhile, Pedro, the treasurer, told the woman that she owed 12 months for 1994 and 6 months for 1995, a total of $450 pesos. She said she could pay only $100 pesos (4 months) that day, and that she would stop by another day to pay the balance.

As this encounter illustrates, many households had not paid their drinking water fees, so the delegación did not have sufficient funds to pay the electric bills to run the drinking water pump. By July 1995, most of the community's households had not paid their water fees for 1994 and 1995, and many households had water debts from previous years as well. Many debtors said they understood the need to pay, but questioned why authorities pressured them since they had the impression that other households owed water fees since the 1970s. Table 7.4, however, shows that the majority of debtors owed no more than two or three years of water fees.

Debtors who owed money for the period before 1994 were less than 10% of the total number of household drinking water connections. Information in the drinking water account books indicates that many of these cases of people with water debts dating before 1994 included: 1) people who refused to pay because the drinking water did not reach their house; 2) people who abandoned the house but did not close the drinking water account; and 3) some were people who had recently been connected and did not begin paying until the following year. This information shows few people had long-standing water debts. If the community hoped to

Table 7.4 Current Drinking Water Debt, 1996

Year	Number of Registered Tomas[a]	Change in Number (and %) of Registered Tomas	Number (and %) of accounts still unpaid
1980	100	---	7 (7%)
1981	172	72 (72%)	6 (3%)
1982	257	85 (49%)	0 (0%)
1983	296	39 (15%)	0 (0%)
1984	384	88 (30%)	0 (0%)
1985[b]	---	---	---
1986	---	---	---
1987	---	---	---
1988	514	130 (34%)	23 (4%)
1989	589	75 (15%)	25 (4%)
1990	585	-4 (-1%)	41 (7%)
1991	613	28 (5%)	44 (7%)
1992	703	90 (15%)	48 (7%)
1993	801	98 (14%)	75 (9%)
1994	835	34 (4%)	196 (23%)
1995	844	9 (1%)	386 (46%)
1996[c]	865	21 (2%)	575 (66%)

Source: Account books from the Comité de Agua Potable, Delegación Municipal, La Purificación Tepetitla.

[a] A toma is the household connection to the drinking water system.

[b] The account books from the 1985-1987 civil administration were unavailable for analysis.

[c] The data for 1996 were taken only for the months of January to May.

pay delinquent electric bills, authorities needed to collect money from the group who owed for the months since 1994. During the shortage, authorities showed people the electric bills as well as the account books for 1994 and 1995, indicating that most households had not paid their drinking water fees and that it was not a problem caused by the few households with more than two years of debts.

Table 7.4 also illustrates the increasing number of registered household water connections (tomas), which reveals the extent of the households affected by the water shortage. The information indicates that there has been a tendency to increase the number of household connections from 15% to 30% per year. During the 1994-1996 civil administration, civil officials have tended not to permit new drinking connections. Based on my observations and discussions with water authorities, most new cases represented unregistered connections that became officially registered, but the pace of adding completely new household water connections has slowed. Indeed, some of the connections during 1994-1996 reflected efforts by civil authorities to register people who did not have official connections but their status as a couple (matrimonio) obligated them to pay for water consumption.

Some of the other connections were recently registered as "provisional connections" (tomas provisionales) for households located on ejido plots where, technically, people were not permitted to have household water connections.

However, during the 1991-1993 civil administration, the small irrigation well in the ejido had become polluted from somebody emptying chemicals in the well to clean it. Households in the ejido that used the water from the irrigation well for domestic purposes requested to be connected temporarily to the main drinking water system. In the 1994-1996 administration, the problem had not been resolved, so civil authorities registered the connections as "provisional" and required the households with provisional connections to pay water fees. Civil officials informed the households that they would lose their connections shortly. Civil authorities have generally opposed giving drinking water connections to households in the plains zone because it would drain water away from the households at higher elevations in the community nucleus. This was another instance of denying permission for a drinking water connection as a way to prevent settlement in the plains zone and address threats created by population pressure on the water system.

In the following paragraphs, I continue presenting encounters in the delegación concerning the water shortage. Later, during the first day of the shortage, I observed another woman, in her 60s, also from the colonia, who came to pay her water fees. She asked, "If I pay, will there be water or not"? Carlos explained the problem to her and said there is no water in the entire pueblo. The woman said, in a joking tone, "If I haven't bathed or washed clothes, why

am I going to pay"? Carlos responded, "Right now, all of us are suffering." As with the previous woman, he showed the bills from the electric company to impress upon her the need for everyone to pay their water fees. The treasurer read her account and said she owed 9 months in 1994 and 6 months in 1995 for a total of $375 pesos in order to be up to date in her payments.

Next, a woman in her 70s approached the desk to ask about water. She remained standing, arms crossed, and confronted Carlos and Pedro while several others looked on and listened. She came to pay $50 pesos of her account, and she said that the authorities had to solve the problem. Carlos repeatedly told the woman that everyone was equally affected and that everyone -- community authorities, neighbors, and citizens (vecinos) -- had a responsibility to help resolve the problem. He said that "It is unfortunate that we are now accustomed to the water service, because it is difficult when we don't have it." The woman said it was not fair that everyone who was up to date on paying their water fees was now left without water and that the authorities should take away water from the long-term debtors. Carlos said it had been difficult to locate people with water debts, and he showed the woman the summons they had tried to deliver to debtors. Carlos complained that neighbors offered little help in locating debtors, and the representatives needed the support of other citizens in order to shut off a debtor's drinking water. The woman said

that some people have wells, and they would not pay, but she will pay even if her household did not have water. Carlos also pointed out that few residents have wells and that "we are all equals" ("estamos parejos") in suffering from water. The woman said she wanted water and handed Carlos $50 pesos. Carlos asked her "What am I going to do with the $50 pesos you pay me"? He was implying that he needed more people to pay their fees to have enough money to pay the large electric bills. The woman said that authorities should have warned the community about shutting off the water, and Carlos explained that the electric company had not notified anybody in the community about cutting off the electricity to the water pump. She asked, "What are we going to do? Have a month without water"?

The morning continued with dozens of encounters at the desk of the drinking water committee. Many of these cases involved people who had less than two years of water debts and who were outraged that they should be suffering because of the negligence of others who had large water debts. In these encounters, people came to the delegación to inquire about the source of their suffering and pressure representatives to do something to alleviate the suffering. Carlos and Pedro assured people that local authorities had not intentionally shut off the water to pressure people to pay their debts. They also tried to persuade people that the problem was with everyone because most people had water

debts, even people who consider themselves regular contributors (cooperadores).

The encounters continued throughout the water shortage. Here, I present one more encounter to examine the discourse on suffering from water. On the second day of the shortage, a single woman in her 30s drove to the delegación in her car. She was a health care worker and stood at the drinking water desk talking to authorities for over half an hour. She said that, since moving to the community a few years earlier, she had always paid her entire water fees a year in advance, and yet she had no water. The president explained that nobody in La Purificación had drinking water. She asked, "Isn't there another way to pressure people who have not paid"? Carlos said that representatives could not do anything when the electric company decides to cut the power. He said authorities were planning to call an assembly to have people pressure debtors. The woman said that the people who owe would not go to an assembly.

The president said the authorities needed support from the citizens, because at times when authorities say they were going to shut off debtors' water, neighbors have not supported the drinking water committee. Also, when they have shut off water, people have taken authorities to court in Texcoco for disobeying federal laws prohibiting authorities from shutting off an individual household's drinking water supply. He told them he was willing to shut off a debtor's drinking water, but he did not want to be the

only person running the risk of being arrested by municipio officials. Carlos said many outsiders (gente de afuera) have come to the pueblo with other ideas, including opposition to shutting off drinking water of debtors.

This led Carlos, the woman, and others at the desk to discuss some of the differences between La Purificación's drinking water management and that of municipal governments of the metropolitan area of Mexico City. The president said that people come from the metropolitan area of Mexico City and say that they used to pay much less for their water and did not want to pay the water fees established in the community. Recall that many wealthier neighborhoods in the metropolitan area of Mexico City receive water at subsidized rates (see Flores 1985). Carlos said he was under the impression that city residents become accustomed to not paying for water in the metropolitan area of Mexico City, and that officials do not shut off water of debtors. The woman countered that municipal authorities in the metropolitan area of Mexico City did regularly shut off debtors' drinking water. Carlos explained that the drinking water committee was summoning (citando) debtors to the delegación, but, he said, "unfortunately, here there are different customs" and the people have to have an assembly to give authority to the delegación to shut off water. Carlos said that he was hoping to have the support of people to shut off debtors' drinking water.

The woman said, "I'm not from here, I'm from the district [federal district]." She said that when she bought property in the community, "the delegados told me, 'You have to fulfill your obligations with the faenas and the church.' I accepted, but now I don't have water and I paid for the water." She insisted that they should have been shutting off the water of those who had not paid their water bills. Carlos explained that people wanted him to shut off the water of people who had not paid two or three or six months, but then others say people should have more time to pay their debts. For that reason, he needed support from people like her in order to pass a resolution at the assembly to gain the authority to shut off residents' water.

Carlos also said that there were households with up to four couples (matrimonios) that consumed a lot of water, but they only had one registered water connection. Still, he said, they do not pay their water fees and have large debts. He said that this was not a new problem, but had been going on for years and would continue. Carlos was implying that working adults with the ability to contribute to the system do not register a water connection and they do not pay for their drinking water. He also hoped to get support to register more couples so that more funds would be available to pay for the consumption of increasing amounts of water.

The woman suggested that the authorities needed to explore alternative ways of dealing with the drinking water system. She said it should be like telephone service in

that one pays for the installation and a monthly fee, and if one does not pay, the company cuts off the service. Community authorities should be more strict, the woman insisted. Carlos said they have to be careful to not create other problems, because an alternative would be to "let the government give us state water." The woman said that would be "treated water" (agua tratada) and said that would be worse because "we want potable water not treated water" ("queremos agua potable, no agua tratada"). They were talking about government programs to supply treated urban wastewater to rural communities for irrigation in exchange for the right to pump underground water to the metropolitan area of Mexico City. In part these programs have arisen from the shortage of underground water in the Valley of Mexico and the prohibition against drilling more deep wells for drinking water sources in the valley (Cirelli 1996; Lane Rodríguez 1994; Peña 1996). Carlos said, "Here, our water, thank God, is very pure, more pure than water they sell in bottles." The woman agreed, discussed the problem a bit more with Carlos, and left the delegación.

During the two-week water shortage, people continuously engaged in similar discussions concerning drinking water in the delegación. People complained about their suffering, saying that they had no water for drinking, let alone for bathing, cooking, washing dishes, and cleaning the house for family visiting for the weekend. Authorities assured residents that they had not shut off the water to pressure

people to pay, even if this was the consequence. Too many people had water debts, so the authorities could not pay the electric bill to run the water pump. Authorities also explained that the design of the water system made it difficult to shut off an individual household's water connection. The drinking water committee's desk was a place to complain about suffering. It was also a gathering place to call for stricter treatment with debtors, to criticize civil authorities, to criticize new residents and to evaluate old customs. The water shortage was a moment to consider the less desirable alternatives, such as carrying water, buying water in Texcoco and carrying it home, requesting water from trucks (pipas), and allowing the government to take over the well in exchange for treated water.

Other Encounters

The delegación was the principal setting for encounters between community authorities and residents about the drinking water shortage. However, after several days, the intensity of the encounters increased and extended to the streets, people's homes, and community assemblies. Here, I touch on a few of the main ways people addressed the water shortage.

Authorities put up posters to announce the problem. Officials placed one poster on the door of the delegación

and ten others in the small stores along the main streets. The posters had the following message:

> Attention. All of the inhabitants of this community are notified to come to pay for their consumption of drinking water, in order to pay the bill for the electricity that is presently suspended. Sincerely, the Drinking Water Committee.
>
> (Atención. Se les comunica a los vecinos de la comunidad que pasen a pagar su consumo del agua potable, para así poder pagar el recibo de la energía eléctrica ya que está suspendida. Atentamente: Comité de Agua Potable.)

In addition, authorities intensified their efforts to send summons to debtors. This involved physically carrying summons to people's houses. Authorities talked with other residents about who had the largest debts, and a worker in the delegación took summons to houses and told the person's neighbors about the water debts.

People also talked about the problem in settings where they tried to gather water. For example, people began hauling laundry to a small spring at the southern edge of the community. Others hauled buckets of water from the spring to their houses. People ordered water trucks from Texcoco and paid to fill their household cisterns. These activities involved people complaining about their suffering, which was generated by hauling water and laundry, looking for water, rationing water, collecting rain water, and using irrigation water.

The community held a series of "emergency assemblies" (asembleas urgentes) to deal with the problem. The first assembly included only 50 or so people, because, people told me, the debtors did not want to be identified publicly. The assembly accepted a resolution developed by the drinking water committee in consultation with other civil authorities. The resolution stated, among other things, that the authorities would shut off the water of anyone who owed more bills than for two months. The assembly formed a commission that went house to house in each of the five sections of the community. Each group included civil representatives, voluntary citizens, and neighbors from each section of the community.

Within two weeks of having suspended the electricity, the community had raised money to pay a portion of the electric bill, and the electric company restored electric power to the water pump, and the community once again had drinking water. Authorities, however, reduced the amount of time that the pump ran in order to save electricity. They also pressured residents to pay their water debts. The commission lasted for several months and was mobilized each time the electric bills were past due. Authorities also called a number of other assemblies to deal with water shortage issues.

Contending with New Federal Water Laws

In addition to the economic crisis and the water shortage, los Purifiqueños were contending with political changes regarding drinking water management. Mexico passed new federal water laws in 1992, which were part of a series of neoliberal reforms to privatize water management, principally the management of irrigation and urban drinking water systems. Authorities in La Purificación did not deal directly with the laws until late 1995 when federal officials notified irrigation authorities and the ejido committee about campaigns to register (regularizar) the nation's water resources including each individual water well. Recall that the drinking water well was officially registered as an irrigation well located on ejido land. Local authorities did not receive a direct notification that the new federal water laws would affect local drinking water management. In this sense, federal programs did not recognize local drinking water management and, therefore, did not notify the community of the requirement to register the well and obtain an official grant to use the nation's water resources for the community's drinking water supply.

After receiving the notification, community authorities made numerous trips to the offices of the Comisión Nacional del Agua (CNA) in Mexico City. They sought information regarding the registration of irrigation water supplies and sought advice on how to register the drinking water well. The group of irrigation users was going to receive a title

authorizing their management of irrigation water, and community authorities inquired how the community could receive a similar title to manage its drinking water system. CNA officials explained to community officials that, according to the new laws, only the municipio had the right to manage drinking water, not the community (see Leyes y códigos de México 1994b). The officials explained that the municipio could "lend" ("prestar") rights to a community to manage drinking water, but the municipio had official control over the system and could transfer authority to a private company. CNA officials said they had notified the Municipio of Texcoco about the process of registering drinking water wells. The municipio, however, did not contact the community because it did not realize that La Purificación's irrigation well had not been registered with the federal government as the community's main source for drinking water.

In 1996, community authorities requested the municipio to give them a document ceding authority to La Purificación to manage its drinking water, but the municipio refused the request. By law, the municipio had to state that it was not able to provide the community with drinking water service, something the municipio did not want to do because it had contributed funds to drinking water projects. The community proceeded to register the wells with the CNA, but only with the municipio agreeing to lend the community control of

water services. The municipio did not agree to cede to the community the right to manage the drinking water itself.

Consequently, authorities in La Purificación were alarmed that the new water laws reinforced municipio control of the community's drinking water system. Community authorities feared that the Municipio of Texcoco would intervene directly in and perhaps take over the drinking water system, something that has already occurred in several communities near Texcoco. When authorities from La Purificación submitted materials to CNA to register the well for drinking water, a CNA official said that the community was using three to four times the volume of water that was indicated for its population and that this inefficient water consumption could signal the need to transfer community management to a more efficient system (i.e., the municipio). Community authorities also noted that the municipio authorities had increasingly voiced objections to community policies, such as charging differential drinking water fees based on residency status and restricting drinking water to impose sanctions on people regarding issues unrelated to drinking water. The tension between community and municipio officials did not appear to be as intense over similar irrigation management policies.

Federal privatization efforts represented a measure of uncertainty for local officials, especially since municipio and federal officials seemed unclear about how the new water laws would affect La Purificación's drinking water system.

Many community authorities and residents like their system and, despite some problems, they recalled only the 1995 water shortage and one other period of water disruption since installing the piped water system. Community residents said they would like to maintain local control over the drinking water system, especially when they compared their water service to other public and private services, such as the municipio cemetery maintenance, highway repair, electric service, and telephone service. These services have involved high cost, little accountability to local residents, poor responsiveness to problems, shortages, and inequitable, market-based distribution principles that provide a service to those who pay money.

Residents also feared that the community could lose an important source of power and autonomy. Authorities suggested that new legal and economic practices risked compromising residents' ability to gain access to adequate supplies of water for domestic use. This, in turn, would lead to new forms of suffering from water.

Summary

This chapter focuses on suffering from water in La Purificación. The local discourse on suffering from water reflects and expresses bodily discomfort with the inadequate daily supplies of drinking water in a socially marginal setting of the Valley of Mexico. I use the concept of

bodily distress to refer to a nexus of people's negative physical, emotional, psychological, and social experiences regarding an inadequate quantity and distribution of drinking water. People feel a bodily disruption with thirsty and dirty bodies, unclean domestic settings, and upset family members. People without water feel rage and injustice when, in such circumstances, others have water. People express this suffering when the entire community endures an acute water shortage, but some residents express this suffering on a daily basis and make drinking water politics a central aspect of everyday life in La Purificación. People make their distress social and seek to alleviate suffering by dealing with the social roots of their suffering. This analysis demonstrates that people make their individually experienced bodily distress a social issue and engage in collective measures to alleviate that social distress.

Water authorities and community residents regularly discussed suffering from water, especially during water shortages. People presented their suffering, and suggested actions people needed to take to alleviate the suffering. When electricity was suspended to the water pump, civil authorities regularly told people that everyone in the community was suffering from water and that the community needed to decide how to pay for the electricity and deal with pervasive problems of managing the water system. Authorities pointed out that the problems included water

debtors, couples who consumed water but did not pay for it, and the need for the community to support authorities who shut off water connections. People who tended to pay their water fees said it was not fair that everyone suffered for the delinquency of a few and that they had fulfilled their community obligations and ought to have received their share of drinking water. Further, during such encounters, people agreed that they should preserve their system and not allow the behavior of debtors to put their drinking water system at risk of failure. Alternative ways of obtaining adequate water supplies would have been more costly, less abundant, and less pure, and, by implication, would have generated more hardship.

Los Purifiqueños are concerned about water quality, but not solely in terms of biomedical measures of purity. People may value water that looks pure even if it has biological contaminants that could put people at risk for diarrheal diseases. People value relatively clean water, not simply for drinking, but also for cooking, bathing, laundry, and healing, activities that may not require water to meet biomedical standards of potability. In general, people expressed most concern about the pervasive, daily reality of struggling to secure adequate water supplies. Alleviating suffering from water involved recognizing drinking water is a contested resource. Women were major participants in articulating and addressing suffering and confronting social forces that threatened access to water

for poorer households. Community officials attempted to impress upon residents the need to contribute to the community-controlled drinking water system or risk losing this benefit to others with competing economic and political interests. This is especially true in a time of economic crisis and neoliberal reform.

Chapter 8

SUMMARY AND CONCLUSIONS

This dissertation analyzes political aspects of drinking water management in La Purificación. Drinking water is a scarce and contested resource in the semiarid and densely populated Valley of Mexico, and it is a central aspect of community life in La Purificación. Research has shown how social and economic differences relate to wide disparities in access to adequate amounts of drinking water in the Valley of Mexico (Flores 1995; García Lascuráin 1995). Government-sponsored initiatives have channeled drinking water to wealthier urban neighborhoods, and wealthier groups pay less for more water than poorer areas in the valley. Public health initiatives have called for improved drinking water systems in rural communities of Mexico, but research has documented a high failure rate for the long-term operation of water and sanitation systems in rural Latin American communities (Elmendorf 1981).

La Purificación, however, represents a long-term case of people developing and managing a locally-controlled drinking water system, which has alleviated their suffering

and improved their lives. I attribute part of the community's results to residents' efforts to deal with ongoing external and internal political processes as they manage drinking water according to meaningful practices that are rooted in a campesino history of managing irrigation water. In large part, this has involved a core group of community residents who have mobilized the organizational power of the cargo system to deal with water distribution issues and suffering brought on by water scarcity. Below, I discuss the theoretical and applied significance of conceptualizing drinking water politics.

Drinking Water, Health, and Suffering

Millions of people around the world -- especially poor, powerless, and rural people -- suffer from water-related bodily distress (Lane and Rubinstein 1996; Whyte 1987). Most scholarship tends to address this health problem by calling for improvement in drinking water quality defined in biomedical terms as decreased exposure to disease-causing pathogens and decreased levels of disease. International health programs call for the installation of piped drinking water systems in rural areas (e.g., PAHO 1987; Whyte 1987). These efforts, however, often have limited results (Elmendorf 1981). Researchers have noted that public health programs (including those designed to improve water quality) often examine the program failure in relation to local

administrative, technical, and cultural obstacles and the lack of community participation (Morgan 1993; Navarro 1984).

To broaden such perspectives, I relate drinking water to complex social relations, especially relations involving groups competing for authority over drinking water management. I also seek to broaden conventional understandings of the relation between drinking water and health by examining ways that some people inextricably link water quality with water quantity and water distribution. In my analysis, I use the term "drinking water" to refer to the water people rely on for household consumption. Locally, people talk about "drinking water" and authorities manage the "drinking water" system. Further, government development efforts in Mexico target drinking water projects and monitor the installation of "piped water" (agua entubada). My study, however, reveals that people use drinking water for a wide variety of domestic purposes. In future research, it would be worthwhile to use the concept of "domestic water" and analyze domestic water politics.

My research shows that many residents in La Purificación have been concerned about the health dimensions of their drinking water. Los Purifiqueños participated in government-sponsored health initiatives in the region, including programs aimed at reducing risk of diarrheal disease, parasitic infection, and cholera by advising people to purify water (e.g., boiling and chlorination) before consuming it. Los Purifiqueños, however, also were engaged

in activities that were not addressed by biomedical approaches. Residents participated in developing a system to replace polluted surface water with cleaner underground water for household use. The drinking water was necessary for a variety of daily uses, including drinking, bathing, washing dishes, laundry, and cooking. Even if biochemical water tests indicated that the water coming directly from the faucets was not suitable for human consumption (i.e., drinking), community residents saw a relative improvement in water supplies for household consumption (i.e., domestic use).

Los Purifiqueños, however, related their suffering not only to issues of water quality but also to issues of water quantity. People were interested in obtaining cleaner drinking water, but they also wanted sufficient amounts of water to take care of daily necessities. When people did not have enough water, they experienced bodily distress that they referred to as "suffering from water." People reported pain, anxiety, and exhaustion when they lacked sufficient water supplies and had to haul water, ration water, and deal with water authorities. The suffering of living with limited water supplies was another motivation for participating in the laborious process of installing and managing a piped drinking water system. My research shows how some people live with a certain measure of water impurity in exchange for securing greater quantities of water. This seemed especially important given residents'

knowledge of water scarcity in other areas of the Valley of Mexico.

Furthermore, many of los Purifiqueños said they suffered when water was unfairly distributed. Suffering from and about water was related to both having insufficient water supplies and seeing others with disproportionately more water. People seemed willing to tolerate impure and rationed water supplies if it was a situation that everyone endured, but people were less tolerant of suffering if others had disproportionately more water. As was the case with irrigation water, intracommunity drinking water allocation has been based on providing adequate water supplies to residents who fulfill community obligations. Many residents, especially those of middle and lower socioeconomic strata, resist pressures to distribute water based solely on a person's ability to pay money.

These observations support Morgan's (1993) assertion that people conceive of health in broader ways than primarily the absence of disease and reduced exposure to disease (see also Abaya 1994; Farmer 1992; Scheper-Hughes 1992). Morgan (1993:166) concludes her study of community participation in health projects by criticizing views that overlook political factors:

> For those who view health as more than the absence of disease, who believe that health is the outcome not just of universal access to medicine but of adequate sanitation, access to gainful employment, positive working conditions, and freedom from institutionalized injustice, then the health of the poor improves as

> people resist the forces that perpetuate inequality. This kind of participation has always existed.

This observation could easily be applied to La Purificación. Residents recognized biomedical problems with water, and they knew about official health programs that suggested that consuming unpurified water put them at risk for certain diseases. Residents live with drinking water supplies that may not meet biomedical standards because they struggle with water scarcity and unequal distribution, which, to their minds, seem like more pressing problems. These finding reinforce suggestions to analyze further the health dimensions of water scarcity and unequal distribution in Mexico (e.g., Estrepo 1995).

I analyze suffering from water as an example of social suffering (see Kleinman, Das, and Lock 1996), a form of bodily distress that originates from social inequality. Social suffering motivated some residents in La Purificación to examine the social origins of their bodily distress and engage in efforts to alleviate that distress. Rather than relying on preventative measures at an individual level (e.g., not drinking unpurified water), many residents examine the social bases for water shortages and engage in a range of actions such as protesting to water authorities, arguing at community assemblies, mobilizing water commissions, pressuring people to fulfill community work obligations, and confronting water debtors. For example, during the two-week water shortage, residents requested

authorities to open their accounting books and allow the public to scrutinize accounts of debtors and people who had not contributed labor to water projects. People also wanted to know which houses with several couples were only registered under one water connection.

Social suffering was shaped by diverging and converging interests based on socioeconomic status, residency status, and gender. In particular, women of lower socioeconomic strata mobilized to address the disproportionate manner in which they suffered from water. They accused wealthier residents of not paying water fees but using drinking water to fill large cisterns and maintain large ornamental gardens. Similarly, some new residents of lower socioeconomic strata accused established residents of taking more water and using it for greenhouses. Regardless of local economic differences, most residents seemed to recognize that they occupied a relatively poor and powerless position within the broader Mexican society. This, I believe, was related to a local interest in preventing social and economic inequalities from leading to the sort of suffering people of similar social positions face in other areas of the Valley of Mexico. These examples suggest how people related their suffering to local economic differences. Residents transformed their individual bodily distress into social distress by identifying social sources (e.g., economic inequalities, debtors, inattentive authorities, the electric company, couples who do not

contribute to the community, urban centers that desire the community's water) that lead to an unequal distribution of drinking water. To alleviate suffering, los Purifiqueños attempted to confront these social sources and maintain local control of the drinking water system.

This research also addresses a limitation of political economy of health studies that argue that the incidence of waterborne diseases and lack of safe drinking water supplies have been generated by the influence of external capitalist relations (e.g., Doyal 1979). As Morgan (1987) notes, political economy perspectives in medical anthropology need to pay more attention to ways that health issues emerge from an interplay of local initiatives and global processes. My research shows that an interplay of uneven processes of capitalist development, regional specificity, and local initiatives have mediated the installation of a drinking water system in La Purificación. For example, many of los Purifiqueños have been campesinos who made a living by a combination of agricultural production and wage work. Residing in a rural community meant that they were often excluded from several of the government's urban-focused drinking water development programs. Some residents, however, used monetary resources to invest in campesino agriculture and irrigation, which in turn supported the drilling of a deep well and the installation of a piped drinking water system. When new residents of higher socioeconomic strata settled in the community, they were

excluded from positions of authority over the drinking water system, and, in many cases, have abided by local campesino customs. Future research in the region will need to pursue the persistence and transformation of campesino water practices as the region's population relies more heavily on wage labor.

A Political Ecology of Drinking Water

This research examines the political aspects of ecological change related to managing a rural drinking water system in a semiarid setting. This study draws on political ecology approaches to conceptualize drinking water as a scarce and contested resource that is part of a changing ecology (Baer 1996; Blaikie 1994; Bryant 1992; Greenberg and Park 1994; Johnston 1997; Peet and Watts 1993; Rocheleau, Thomas-Slayter, and Wangari 1996; Whiteford 1997). This conceptualization challenges portrayals of drinking water as a readily available resource waiting to be delivered with the proper outside technology, knowledge, and administration. La Purificación and other foothill communities in Northern Acolhuacan have long confronted powerful outside forces and environmental injustices regarding unequal access to water. This study shows that a major arena of contestation in foothill communities has shifted from irrigation management to drinking water management.

Water is indeed a scarce resource in the semiarid environment of the Valley of Mexico. For centuries, people in foothill communities of Northern Acolhuacan have contended with this scarcity by channeling surface water from distant sierra springs to their settlements. These efforts, however, have also involved dealing with other powerful groups who have made claims on the water. In this sense, water scarcity has been socially constructed. That is, water has become scarce for some groups (usually those with less structural power) and not as scarce for other groups (usually those with more structural power). This relates to a broader pattern in Mexico of rural peasant communities having inadequate drinking water supplies (PAHO 1987; Restrepo 1995). Residents of La Purificación, however, have mobilized local organizational power and local communal resources to secure their claims to surface water for agricultural and domestic uses. At times, outside entities have denied permission for the community to access surface water and groundwater for domestic purposes, which has led residents to use innovative ways to channel water to their households. For example, postrevolutionary agrarian reform allowed the community to obtain nonirrigated ejido land for agricultural production at a lower elevation in the 1930s upon which the community drilled a well in the 1970s to pump groundwater up to the community for domestic use. Until the 1990s, the well remained officially registered as

an "irrigation" well and was run in a semiclandestine manner.

Contestations among community residents also center on how drinking water should be managed. Political ecology studies have noted that a variety of social factors, particularly economic differences, shape access to and use of resources (Blaikie 1994; Bryant 1992; Greenberg and Park 1994; Johnston 1997; Peet and Watts 1993). I examine ways that conflicts over water management are shaped by economic differences as well as residency status and gender issues. For example, established residents with ties to agriculture and irrigation uphold the notion that drinking water is a communal resource whose distribution ought to be governed by nonmarket principles. New residents, particularly those of the upper socioeconomic stratum, view drinking water as a service and expect to obtain as much water as they can pay for. Wealthier new residents are accustomed to urban water policies, which, as in the case of some neighborhoods of the metropolitan area of Mexico City, often overutilize water resources and divert water from rural areas to supply water to upper-class and middle-class neighborhoods (Flores 1995; García Lascuráin 1995; Melville 1996; Restrepo 1995). When wealthy people settle in La Purificación, they occupy an ecology where people ration water and distribute water using nonmarket principles. This issue needs further study to examine urban-to-rural migration and the emerging conflicts over the meaning and use of natural resources.

In my view, literature about installing drinking water systems often assumes that water is a readily available resource in an unchanging ecology, waiting to be developed with outside expertise. By contrast, I examine drinking water as part of a political ecology. Los Purifiqueños have been very interested in installing and managing a piped drinking water system, but they also have had to contend with powerful groups with competing interests in using the resource. This relates to environmental justice research that shows that marginal communities often bear a disproportionate burden of ecological problems (Johnston 1997). In the Valley of Mexico, poor, marginal communities often pay more money for water, rely on less secure methods of water delivery (e.g., water trucks), and receive less water than wealthier urban neighborhoods (Flores 1995; García Lascuráin 1995).

Furthermore, my research suggests that when rural communities install better drinking water systems, outside entities, such as the municipio, view the community as more "modern" and "urban" and seek to intervene in local water management. In fact, Mexico's water laws differentiate primarily between rural irrigation management and urban domestic use and give authority to municipio officials to administer all community drinking water systems within municipio political boundaries (Leyes y códigos de México 1994b). In the case of La Purificación, Municipio of Texcoco officials have increasingly intervened in community

management of drinking water and have claimed to be temporarily "lending" drinking water authority to the community. This points to ways that installing a rural drinking water system leads to ecological changes that have social consequences for those who developed the system.

My study also illustrates the need for political ecology of health approaches to pay more attention to issues of meaning in relation to environmental health issues. In my view, recent discussions about developing political ecology of health approaches tend to focus on biomedical concerns about environmental change, such as how deforestation increases malaria and water pollution increases cholera (e.g., Greenberg and Park 1994). My research indicates the need to incorporate broader notions of health and suffering into political ecology of health approaches, and examine how local forms of suffering express ecological change even if they do not correspond to biomedical categories of disease. Such local forms of suffering can motivate people to contend with the social forces that promote environmental injustice and unequal distribution of resources.

This study also indicates the need for a similar analysis of wastewater and sanitation systems. International health programs often link sanitation with drinking water supplies, as was reflected in the name given the 1980-1990 International Drinking Water Supply and Sanitation Decade. Wastewater management is becoming an

emerging issue in the Valley of Mexico, and governments are under pressure to drain immense quantities of wastewater out of the valley to avoid floods (see Cirelli 1996; Peña 1996). Rural communities that receive this wastewater for irrigation are faced with different kinds of health risks (Cifuentes, Blumenthal, and Ruiz-Palacios 1995; Juan, Pérez Duarte, and Aguilar Romo 1995; Lemus R. 1995). Further, data from La Purificación indicate that residents are reluctant to install sewage systems, not because they do not understand biomedical risks, but because they worry about ecological changes that may drain away water needed for irrigation. Also, to some minds, it risks installing further infrastructure that makes the community less provincial, more urban, and more attractive for further in-migration of people who challenge locally constituted authority. Further study is needed to see if similar concerns are expressed in other foothill and sierra communities. This study, however, hints at the way community-managed wastewater systems are sites of negotiation and contestation about meanings and practices of water control.

Drinking Water and Power

Scholars have studied the relationship between water and power in arid and semiarid ecologies of Mexico (e.g., Palerm Viqueira 1995; Viqueira Landa 1994; Enge and Whiteford 1989). I have drawn on Wolf's (1990) notion of

structural power and local organizational power. Studies in rural Mexico have shown that powerful groups use their ties to structural power (as a result of their position within the larger political economy) to gain control of irrigation water for capitalist production. In some cases, however, groups have formed "collective, locally based organizations" (see Enge and Whiteford 1989:13) that deploy their organizational power to create a measure of autonomy from the larger political economy. Further, people who manage and control an irrigation system hold a measure of organizational power over users in the system (Palerm Viqueira 1995; Viqueira Landa 1994). A centralized political authority relates, in part, to local efforts to mobilize labor and channel resources into the construction, maintenance, repair, and management of the system. Further, a centralized political authority mediates relations with outside entities that may try to claim the water for other purposes. Similar to what Palerm Viqueira (1995) argues, I show that water users benefit from the collective efforts of the system even as they give up a measure of personal autonomy.

My study complements research on the relationship between irrigation and power by showing that drinking water can also be a source of organizational power in Mexican communities. Residents in La Purificación have obtained water for domestic use by mobilizing the cargo system and managing conflicts and disputes with powerful outside

entities, including the state, large landholders, and neighboring communities. During the 20th century, the Mexican state has placed a higher priority on supporting irrigation rather than drinking water development in rural areas. At times, the state has restricted and ignored the development of a drinking water system in La Purificación. As a result, La Purificación has tapped into structural and organizational sources of power and developed an autonomous system of supplying its residents with water for household consumption.

La Purificación is a foothill community that, until after the revolution, had no abundant sources of water within its political boundaries. In the decades immediately after the Mexican Revolution, the community expanded its holdings on surface water from mountain springs, primarily because the state opened up possibilities for campesino communities to obtain land and water for agricultural production. Later, in the 1970s, the community was unsuccessful in its attempts to get state support to install a piped drinking water system, so community residents used resources available to campesino communities for agricultural development and, officially, developed underground sources for irrigation. These efforts, however, provided the means to drill a deep well and install a piped drinking water system, which, decades later, became officially registered as a drinking water system.

Community authorities separated drinking water management from irrigation management. Drinking water management, however, emerged from a legacy of irrigation management and remained a central part of the community's political and religious organization. During my fieldwork, a minority of residents relied on irrigation water, and drinking water was the indispensable community resource upon which every resident depended. Community authorities gain power over other community residents by controlling access to and distribution of drinking water. Each resident who wishes to legally connect his or her household to the drinking water system must abide by local customs, including paying differential water fees, paying differential monthly water fees, working in faenas, and fulfilling community service in guardias, mayordomias, and civil cargos. Elected cargo officials, who create and enforce these customs, usually share similar characteristics, including the possession of irrigated huerta land and ejido plots. Cargo offices generally reflect the interests of established residents with ties to agriculture and those of middle and lower socioeconomic strata. Established residents engaged in commercial agriculture maintain access to drinking water for irrigation of greenhouses without paying commercial fees. Those of lower socioeconomic strata also are interested in obtaining a fair share of drinking water without bearing a disproportionate share of the monetary costs and labor obligations of managing the system.

In this process, residents in La Purificación have taken meanings, practices, and institutions associated with irrigation management and transferred them to drinking water. A sector of the community asserts that drinking water, like irrigation water, is a communal resource requiring one to fulfill communal obligations. The political economy of the region has shifted, and a greater portion of the population relies more on wage labor and less on subsistence agricultural production. Residents maintain, however, that drinking water should not be viewed as a commodified service. Using their organizational power as campesinos and cargo holders, residents maintain control of the system and impose their view of resource management on others who wish to benefit from the system at the expense of poor campesinos.

La Purificación's approach to drinking water management has noncapitalist features that coexist within and against a dominant and pervasive capitalist system. The community attempts to restrict access to water rights, not with a market system, but rather based on other factors: kinship, fulfillment of community obligations, residency status, and type of housing. One earns the right to drinking water by cooperating with and working for the community. Thus, through the exercise of organizational power and the threat of sanctions, established residents reinforce a sense of cooperation that is related to providing a just distribution of drinking water. In addition to this repressive

deployment of power, residents are involved in processes that illustrate the productive deployment of organizational power. New residents (especially those of the upper socioeconomic stratum) resist local practices, but they also benefit from the system by receiving a relatively clean source of water. Furthermore, many new residents, as they participate in social networks and reciprocal relationships, appear to accept some of the local principles. A customary and, at the same time, changing form of drinking water management has emerged in relation to an ongoing interest in generating cooperation and resolving conflicts. The system appears to have some democratic and egalitarian tendencies (e.g., rotating leadership, citizen participation in policy formation, fair water distribution), but these tendencies are supported in part by the organizational power of a particular group of residents.

A market-based water distribution system might seem fair to some residents. Urban systems, for example, rely on valves and meters to regulate and measure water consumption, and, theoretically, people pay according to the amount of water consumed. In reality, in the Valley of Mexico, people do not have the same measure of economic wealth and are not afforded equitable access to water. Los Purifiqueños live with the contradiction that Mexico's federal constitution guarantees its citizens access to water, but it does not guarantee a fair distribution of that water. Researchers point that some municipal governments in the metropolitan

area of Mexico City subsidize drinking water for wealthy urban neighborhoods and pursue a policy of overutilization of water to supply wealthier areas with large quantities of water (Restrepo 1995). Poor settlements on the outskirts of the metropolitan area of Mexico City pay more for less water, and spend proportionately more of their household's time, money, and labor to obtain water (Flores 1995; García Lascuráin 1995). Los Purifiqueños are aware of these issues and the general water crisis in the Valley of Mexico. They know that their marginal position puts them at risk for losing access to their water supplies. Indeed, they have seen neighboring communities lose control of both irrigation and drinking water as Texcoco and Mexico City channel water away from rural areas to the urban centers (Lane Rodríguez 1994). Structural power relations make it difficult for relatively powerless rural communities to maintain an unlimited water supply. Officials in La Purificación ration the amount of water delivered to households, but they also attempt to ensure that everyone will benefit from having access to minimum amounts of drinking water.

This study also illustrates some interesting trends regarding gender and power within the community. In contrast to irrigation management, women seem to hold a visible role in drinking water management. While women do not hold civil offices on the drinking water committee, they do influence the activities of the civil authorities. Women are listed as a significant percentage of drinking water

consumers, and they participate in community assemblies, water commissions, and encounters in civil offices. Women also occupy religious cargo offices and education association offices. Women also most often manage household water supplies. As a result, when they articulate their suffering from water, they underscore a link between private water use and public water issues. During this study, La Purificación did not have the kinds of water protests lower-class, urban Mexican women have staged (see Bennett 1995a, 1995b). Women in La Purificación from various socioeconomic strata have allied to confront authorities with whom they have personal ties. Women in La Purificación have some measure of influence in water management and, for the moment, have avenues of political action other than protest.

La Purificación has begun to experience the consequences of Mexico's new water laws and privatization efforts. This study suggests that a new political and economic climate will generate new conflicts, especially between community authorities and the municipio. Future research ought to track the course of these conflicts and investigate to what extent communities lose organizational power when drinking water management transfers to the municipio or another external political entity. Such an investigation may require a regional analysis to compare how different communities mobilize the cargo system, deal with the emergence of commercial agriculture in the form of greenhouses, and deal with regional tensions among Mexico's

political parties. In this study, I have related the complexity of drinking water management to these issues, but a regional analysis would be helpful for clarifying these political aspects of drinking water management.

Drinking Water, Culture, and Social Change

Many conceptions of the problem of drinking water in developing countries rely on differentiating so-called "traditional" culture from "modern" culture. Such frameworks associate a piped drinking water system with modernity, and the absence of running water as part of traditional culture, a "sign of the primitive" (Comaroff and Comaroff 1992). This image may be easier to accept for those living in industrial, water-rich settings. This image, however, risks blaming the failure to properly manage a drinking water system on local ignorance, passivity, and lack of proper technology.

To confront this image, I examine ways that los Purifiqueños have sought access to clean and adequate drinking water supplies. They have faced many political obstacles to the installation of a drinking water system. Such obstacles have included denials by government programs of drinking water development resources and permission to drill for water. At times, the community has seen attempts to claim the region's water supplies for urban areas. Los Purifiqueños have used local principles and practices to

manage the drinking water system, partly in response to such threats.

Community residents have created local ways of managing water resources in a fair way. This has involved continuous negotiations, disputes, debates, and disagreements among residents in the streets, civil offices, and each others' homes. People claim that drinking water, like irrigation water, ought to be managed in a traditional way as a communal resource, but residents also have created new meanings and practices that are consistent with previous customs and traditions. Residents have been flexible, for example, in creating new cargo offices to manage drinking water, and authorities have changed the obligations regarding cargo service. Residents have also created new ways of charging residents for the right to establish a household connection to the drinking water system, and they have created new categories of water fees. Further, new sorts of people are entering into community service, primarily in lower offices of the civil-religious hierarchy, which has given women, new residents, and nonagriculturalists greater access to local authority.

Recent analysis of peasant communities suggests that the cargo system is flexible and can be mobilized to create closure regarding access to community resources (Roseberry 1989; Stephen and Dow 1990; Wolf 1986). This study provides more evidence of the flexible and dynamic features of cargo systems. In this case, the cargo system tends not to act as

a leveling mechanism to distribute productive resources and decrease economic differences, although there is evidence that it may have done so in previous decades. There is evidence, however, that some people participate in the cargo system to justify economic differences. For example, wealthier households, especially those of the commercial segment of the upper socioeconomic stratum hold many of the highest cargo offices and receive access to drinking water, which they also use for greenhouse production. Further, economic differences are not leveled since population changes and rotating elections mean that households of upper economic strata occupy cargos less often than was the case a few decades earlier.

The cargo system, in this case, did not prevent social stratification from occurring, but my research shows that it can mediate some of the consequences of that stratification. In La Purificación, the cargo system seems to be a form of organizational power that is used by people of all socioeconomic strata. I present ways that people use the cargo system to distribute drinking water in a just manner. This levels the labor requirements and monetary costs of managing the system and providing drinking water to most residents, including residents of lower socioeconomic strata who would bear a greater burden of water scarcity if they were to reside in other areas of the Valley of Mexico.

Applied Dimensions

This research has a number of applied dimensions for international health and development programs regarding drinking water supplies in rural Latin American communities. Here, I briefly mention some of my own views and those of local residents regarding factors that account for the relatively long time that the drinking water system has remained in operation in La Purificación. These insights may be applied to the problem of drinking water development in rural Mexico and other settings. In general, drinking water development projects involve local meanings and practices related to the environment, human health and suffering, resource distribution, and power relations. Drinking water is not a neutral object, but a potential source of power, conflict, and cooperation.

In general, further research on drinking water development ought to explore political factors that influence the success and failure of community-managed drinking water systems. Installing a piped drinking water system may influence local power relations. Drinking water projects in Latin America are often targeted at poorer and powerless communities, many of which are located in semiarid settings at high elevations (Mesa-Lago 1992). Control of decisions about drinking water may be a source of power in a region, and those with power may challenge the claims of a community to control water resources. In turn, communities with relatively less power may obtain access to scarce water

resources, which may give them a source of power and create new conflicts with other groups. People may also resist drinking water policies that put them at a disadvantage, such as when people of lower socioeconomic strata resist the use of market-based principles of water distribution.

The installation of a drinking water system may also generate internal conflicts. Los Purifiqueños have continuously discussed and implemented numerous policies for distributing drinking water in a fair manner that resists treating drinking water as a commodified service. How to charge newcomers who wish to use the system once it is in place is still being debated.

One advantage of La Purificación's system is that the people who use the drinking water also manage the resource. The users are the ones who have something at stake in managing the resource, and they provide work in the continuous and laborious process of collecting fees, repairing the system, petitioning government agencies for technical assistance and material resources, settling water disputes, and confronting irregular uses of drinking water. In fact, many residents told me that they like being able to go to authorities with whom they were acquainted to address problems. Residents also said that they thought it important that the users of the system were in positions of authority to monitor and deal with problems in the system. There is also a tendency to rotate authority among clusters of users and allow groups of households with water problems

the chance to use resources of the civil offices to obtain outside funds and mobilize local labor to carry out projects.

There is tension, however, between an ideology of participation and the way that some residents are excluded from drinking water management in various ways, to varying degrees. Some residents feel excluded from the project, and greater effort may be needed to allow all users a chance to participate in the system. Accountability is a key issue, and people want greater access to how the drinking water is managed. Women are excluded from public, civil cargos involving drinking water management and seen as simply private, household water managers. However, in the case of La Purificación, women engage in various activities that made private use of water more of a public issue. Similarly, new residents sometimes feel excluded from drinking water management, but some also have participated in the water commission and have built alliances with established residents. Community residents who are water authorities also draw on an extensive knowledge of water control that comes from generations of residents managing irrigation water. This has involved mobilizing labor, imposing sanctions on people who misuse water, and obtaining materials and money to maintain the system. It also has meant dealing with outside agencies, some of which have little to do with health issues or drinking water explicitly. Drinking water management entails dealing with

political issues as well as engineering problems. Further, people may reshape local institutions, like mayordomías, that provide social space to deal with water issues.

One implication of this study is that public health researchers should make greater effort to link water quality, quantity, and distribution. Water programs risk failure when they promote water quality at the expense of providing sufficient quantities of fairly distributed water. Public health initiatives ought to work more closely with those in charge of the water distribution system. Public education campaigns often target women regarding water quality in terms of promoting better hygiene for their families. Studies, however, have noted the need to examine the gendered division of labor concerning drinking water since men are also involved in health-related aspects of water management (L. Whiteford 1997). In La Purificación, men monitor the delivery of water within the community and ensure minimum quantities are delivered to households. Research shows that issues of water quantity are linked to biomedical conditions (Juan, Pérez Duarte, and Aguilar Romo 1995). Men are also often aware of pollution in the water system, and men coordinate the cleaning of the water system. People may reduce exposure to biological pathogens not only by boiling water, but also by intervening to plug leaks in pipes and hoses, clean reservoirs, and take other measures that have a broader impact on health.

Furthermore, research ought to examine whether a dominant focus on water quality and biomedical issues overlooks local health concerns related to water scarcity and unequal distribution. People may not be willing to participate in managing a drinking water system if they perceive that they will receive insufficient supplies and that others will benefit from their labor more than they will. Public health information recommending people to purify water by boiling assume, first, that people have water and, second, that people have sufficient quantities to boil water long enough to meet health standards. People mentioned concerns about losing water through evaporation when it is boiled and wasting money on fuel.

A concern for providing adequate amounts of a scarce resource is also related to rationing. This research shows that people may tolerate limits on the use of a resource like drinking water and not engage in overutilization of the resource if resource distribution is managed in a fair manner. In La Purificación, people have input into the process of distributing water as well as in setting fees, charging new residents money, and obligating them to fulfill community service. Residents also have developed a mechanism that obligates later arrivals who did not work to install the piped water system to help pay higher hookup fees. This dimension should be examined more closely in other water development projects, because installing drinking water is an improvement that may motivate outsiders

to settle in a community and use the resource without contributing to the development of the system.

Conclusion

Drinking water is a crucial but scarce and contested resource that los Purifiqueños have long struggled to obtain in the semiarid setting of the Valley of Mexico. Like people living in other marginal ecological and social settings, residents of this foothill campesino community have faced many challenges to sustaining a locally-managed drinking water system. In particular, they have had to deal with the political factors that make it difficult to provide adequate amounts of drinking water in Mexico's countryside. Community residents have had little access to structural power that channels drinking water to powerful and privileged groups in Mexico. Los Purifiqueños have mobilized local organizational power and invested a great deal of their time, labor, and money to develop a system for delivering a relatively clean, adequate, and affordable amount of drinking water to their households. These efforts draw on an extensive history of managing surface water from distant sierra springs, primarily for irrigation, and have involved political contention between the community and outside entities. In recent decades, after developing a community-managed system for piping underground water to households, residents have seen political conflicts within the community intensify. In contrast to people of lower

socioeconomic strata living in urban areas with no regular access to drinking water, households in La Purificación have gained access to amounts of drinking water that are more or less adequate. Dealing with political issues has been a major factor in the community's ability to sustain its locally-managed drinking water system.

Since the 1970s, the in-migration of settlers (particularly from upper socioeconomic strata) from urban areas have challenged the established meanings and practices of drinking water management. The study shows that drinking water politics involves negotiations and conflicts among groups differing in socioeconomic status and residency status. There are socioeconomic differences within the community, and there is an unequal distribution of water based on those differences. Established residents, however, support a view of drinking water as a communal resource that should be distributed in a just manner to all residents who abide by local customs and traditions. Drinking water authority rests primarily with participants in the cargo system who sustain the interests of established residents and maintain a cohesive and sometimes coercive social organization. New residents, especially new wealthier residents, argue that drinking water ought to be a commodified service that one obtains in exchange for money, and they challenge customary labor obligations.

Water shortages, however, remind residents of the suffering they endure without water. Suffering from water

is a form of bodily distress that expresses social inequality and injustice more than biomedical experience with categories of disease. People have resolved some of the conflicts and reinforced a cohesive social organization to deal with drinking water issues. Los Purifiqueños continue to use their creativity, ingenuity, and perseverance to maintain access to adequate amounts of drinking water and establish a certain measure of environmental justice as well as cultural and political autonomy in their lives.

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AET Archivo Etnográfico (Ethnographic Archive) of the Universidad Iberoamericana, Tepetlaostoc, Municipio de Tepetlaostoc, Estado de México.

AGN Archivo General de la Nación (National General Archive), México, DF.

AHA Archivo Histórico del Agua (Historical Archive of Water), México, DF.

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