The Political Ecology of Environmental Learning in Ciudad Juárez and El Paso County

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Overview

David Harvey noted that every environmental project is simultaneously a social, cultural, and political-economic endeavor (1996). In practical terms, this insight suggests that efforts to promote environmental health in the U.S.-Mexico border region should consider the complex interactions between the environment and other social forces. For example, efforts to make economic expansion sustainable for both society and nature need to consider “structuring forces.” These include the consequences of social stratification, economic scarcity, and the social stigma of poverty upon those border residents most vulnerable to the whims of the market and the vagaries of environment.

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This chapter examines one approach to promoting sustainable environmental health in the border region. In 1994 the University of Texas at El Paso's Center for Environmental Resource Management developed a pilot program of low-cost materials and simple steps to safeguard household drinking water in communities lacking basic water and sanitation infrastructure in the Ciudad Juárez/El Paso metroplex (map 6.1). The pilot program—Agua Para Beber (Drinking Water)—faced a difficult challenge: while short-term public health interventions rarely induce long-term behavioral change, Agua Para Beber nonetheless hoped to identify social factors that could sustain improved household management of drinking water. The pilot program's coordinators reckoned that for most border residents and communities, the environment of the border region would improve only slowly. Thus coordinators wanted to develop easily replicable methods for educating border residents about health risks stemming from environmental conditions and help them exert some measure of control over those conditions. In 1996, Agua Para Beber revisited four of the six original pilot communities to explore how the program’s messages had fared over time. Through this evaluation, Agua Para Beber's coordinators gained a better appreciation for the kinds of social factors that hinder or enhance environmental learning. The evaluation employed ethnographic methods and examined the program's sustained impact in light of political ecology.

Through the evaluation, Agua Para Beber’s coordinators came to understand the role that social conditions play in facilitating residents' efforts to control environmental risks. Some families and some communities that were trained in the pilot program learned to successfully manipulate certain limited features of the environment, in each case through site-specific sets of household and community resources. The important lessons of this evaluation are twofold: resources available for and obstacles to environmental control vary enormously across border communities, and they reflect both large-scale and small-scale political tensions. Thus environmental interventions need to accommodate the particular dynamics and interactions of structuring forces within under-serviced settlements. The 1996 evaluation revealed how environmental learning unfolded in occasionally unanticipated and somewhat unintended ways. Each community offers lessons for considering the social and political conditions that can enhance or impede environmental learning.

Theoretical Concerns and Practical Conditions

While some notion of political ecology has been present in anthropology since the 1950s (see Steward 1955), political ecology as it was used in Agua Para Beber's 1996 evaluation followed more recent con-
caught up and in “natural” features—idiosyncratic to each community—such as population density, topography, and differential access to scarce resources (such as water), among others. Ecological conditions, mediated by politics, contributed in different ways to the program’s impact in each community.

Water quality and supply are never exclusively natural or political matters (Bennett 1995; Reisner 1993; Cobb and Ross 1997). Water allocation follows eminently political routes, both in Mexico (Bennett 1995) and in U.S. settlements along the Mexico–U.S. border (Ward 1999; Lopez and Reich 1997). Such politics become socialized—that is, the political nature of water issues often appears depoliticized in the social settings where access to clean, abundant supplies of water are most restricted. Attention to political ecology thus enabled an evaluation of the politics underlying the social impact of the Agua Para Beber program in the pilot communities.

Although Agua Para Beber is an educational intervention, this chapter describes the program’s impact in terms of “environmental learning.” In so doing, it should be noted that Agua Para Beber’s success stemmed not only from the formal educational content of the intervention but also from its social context. What was taught and what was learned were not the same. In each of the four cases, “learning” was greatly enhanced where the message of the intervention resonated in ongoing political organizing or was amplified through social relationships in the communities. By the same token, where the program failed, it did so because of political and social impediments.

Environmental Conditions and Prospects

The notable absence of piped drinking water and sewage treatment in border cities presents the largest single environmental challenge to residents of the U.S.–Mexico border region (Skolnick 1995a, 1995b; Cech and Essman 1992). Provisions in the North American Free Trade Agreement (NAFTA) and its ancillary agreements assure that a larger proportion of the border population will eventually receive these services through major public works initiatives. Nonetheless, given current rates and patterns of population growth, it is unlikely that potable water lines or sewage collector lines will be available to all border residents.

Current state law has made the sale of undeveloped, underserviced lots in Texas border counties more difficult, yet there are still several tens of thousands of platted but unsold lots in El Paso County. Even though many areas of El Paso County have received financing for water and sewer lines, large tracts of land could be sold and occupied before connections are installed. In Ciudad Juárez, demo-

graphic pressures and infrastructure deficits are even more pronounced. Although numerous under-serviced settlements will soon receive sewer lines in conjunction with the construction of a new wastewater treatment plant, many existing neighborhoods have been excluded from the planned collector system. At the same time, with approximately forty new families migrating to Ciudad Juárez each week (Ward 1999: 32), the number of settlements lacking services is bound to grow. Thus infrastructure will always fall short of the requirements for drinking water and for waste disposal and treatment.

Pipes for drinking water delivery and excreta removal ensure that pathogens found in fecal material cannot easily contaminate drinking water supplies. While the lack of clean, reliable, and steady supplies of drinking water itself increases the risk of disease, the absence of a consistent means of conveying excreta off-site for treatment and disposal compounds health risks. Without such sanitary infrastructure, many poor households are at high risk of waterborne communicable diseases. Consequently the burdens of these infrastructural deficits are shouldered by households that must keep their drinking water supplies free of contamination by fecal material. The bulk of this responsibility falls to female caregivers. In the absence of physical infrastructure, preventative public health interventions, especially those attending to household behaviors and customs, can provide a critical means of addressing a persistent environmental gap along the border. Such interventions can offer female caregivers interim strategies for managing unsafe water supplies so that they can guard against waterborne illnesses.

Agua Para Beber Pilot Program: 1994

The Agua Para Beber pilot program followed a model for community health promotion that has proven highly effective in developing countries, where the absence of sanitation and drinking water infrastructure poses persistent health risks (Werner 1977; Djukanovic and Mach 1975; Frankel 1992; Dhillon 1994). In the early 1990s, a reported 60,000 residents of El Paso County, Texas, living in “colonias”—the local name for under-serviced settlements on both sides of the border—lacked direct access to potable water or sewerage services. At the same time, in Ciudad Juárez an estimated 460,000 people lived without water or sanitation services. High rates of enteric disease in both Ciudad Juárez and El Paso County pointed to problems in sanitation and in reliable supplies of uncontaminated drinking water. Beginning in the late 1980s, health officials in El Paso County and Ciudad Juárez expressed an urgent need for educational programs as an immediate step to reduce illness (Journal 1990; Agua Para Beber 1994).
In response, staff at the Center for Environmental Resource Management, with assistance from the University of Texas at Houston School of Public Health at El Paso, decided to adapt developing country, community-based health outreach models for deployment in communities in Ciudad Juárez and El Paso County.

An initial needs assessment conducted in 1994 revealed that colonia residents obtained water from a number of sources. Most colonia residents in Ciudad Juárez relied on municipal tanker trucks (called pipas) which supplied chlorinated water to households once a week. Families typically stored trucked water in loosely covered or uncovered 55-gallon recycled industrial drums. Such storage exposed families to a number of pathogens and other chemical contaminants. Because residual chlorine evaporates within a few days or is consumed as it oxidizes organic material present in water, unused water loses its sanitary protection within two to three days. Drinking water storage and decanting practices further exposed families to pathogens. For example, smaller vessels for storing drinking water often did not have tight-fitting covers to prevent contamination by airborne pathogens, and the common practice of scooping drinking water by the cupful or by hand easily contaminated water.

In El Paso County, families obtained water from a much broader range of sources, including public and commercial water trucks, outside hose connections, and community water distribution points. Because water was only procured from these sources every few days at best, and often less than once a week, families typically stored general-use and drinking water in a variety of containers. Although many residents of colonias in El Paso County did not have access to municipal water connections, those living in the Rio Grande floodplain relied on water pumped from shallow wells, according to several studies (Sawyer et al. 1989; Cech and Essman 1992; Skolnick 1995b; Lopez 1997). While no studies found that colonia residents actually drank well water, many presumed that they did (Sawyer et al. 1989;2; Skolnick 1995b; 1478).

Following the health-promotion model, Agua Para Beber recruited volunteers from community groups in each of six communities (three in El Paso County, three in Ciudad Juárez). These volunteers were trained as “promoters” and given intensive hygiene and water education. Each promoter also received materials for disinfection and storage to distribute to families considered to be at high risk of enteric infection. The pilot program hoped to capitalize on a “multiplier effect.” Thus, beginning with two staff members from Agua Para Beber, the pilot program trained fifty-one promoters; the promoters, in turn, worked with 525 families, teaching them basic water disinfection and storage techniques as well as hygiene practices.

Promoters first tested residual chlorine in drinking water containers. During the course of the intervention, promoters showed caregivers how to use chlorine (household bleach) as a disinfectant and purifier. Each participating family received a 5-gallon vessel in which to store drinking water. Special features of these vessels included a built-in handle, an opening too small for the introduction of hands or utensils but large enough for water to be poured into, a dispensing spigot which eliminated the need to scoop or pour water, an air vent to facilitate flow, and illustrated labels on water disinfection and domestic hygiene. Caregivers received medicine droppers and were instructed to add small amounts of chlorine (forty drops per container) each time the containers were filled from the industrial drums, standpipes, and tanks.

During the pilot program, promoters visited each caregiver once a week for five weeks. In the first week promoters evaluated existing water practices and knowledge of disease transmission. During the next three weeks promoters discussed practices for prevention of diarrheal disease. Most importantly, they sought to educate caregivers on the “fecal-oral transmission route”—the manner by which pathogens found in human excrement become ingested and cause diarrhea. Each week promoters measured chlorine levels with a simple test kit.

On the final visit, promoters evaluated changes in behaviors and attitudes, testing for comprehension of disease processes and knowledge of chlorination’s benefits. A baseline survey showed that on the first visit only 34 percent of households attempted to disinfect their water with chlorination or boiling. By the fifth visit, 90 percent of households said they disinfected drinking water, and 80 percent of drinking water showed adequate levels of residual chlorine. Households reporting diarrhea fell from 22 percent to 6 percent. Whereas initially only 13 percent of caretakers understood the role of excrement in diarrheal transmission, by the end of the intervention 46 percent did. These changes encouraged program coordinators to regard the pilot program as highly successful.

A follow-up survey conducted one year later showed that the program’s impact had been uneven. While almost 70 percent of families in Ciudad Juárez continued to chlorinate their drinking water, only 38 percent of their counterparts in El Paso did so. However, as will be shown below, the follow-up survey measured only a narrow range of behavioral changes, and it thus failed to capture all the ways in which women, their families, and communities learned to confront problems of drinking water safety. The actual environmental learning stimulated by the intervention was much more varied and promising than

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1 Both chlorination and boiling were offered as methods for disinfecting drinking water. Some families elected to boil water rather than add chlorine.
The follow-up survey indicated. To learn how the success of the program could be better reproduced, Agua Para Beber coordinators undertook an extensive qualitative evaluation in the summer of 1996.

The 1996 Evaluation Methodology

The 1996 evaluation's methods involved semi-structured, in-depth interviews with community leaders, promoters, participating families, and a small number of "control" families—that is, families that had not participated in the intervention. These comprehensive interviews accomplished several of our objectives: to catalogue the varieties of water storage and use and to identify why families chose particular water practices and what they understood about illness and wellness. We presumed that both practices and beliefs were social in nature. We thus sought to understand the relationship between such practices and the socioeconomic and political dynamics of each community. Interviews focused on practices and beliefs, but they also explored how residents in each community saw their relationships with promoters, with community leaders, and with their neighbors. Such a holistic approach inevitably sacrifices somewhat the collection of comparable data from all interviewees. However, we were more interested in understanding the social processes that shaped environmental learning than in individual household profiles. We expanded upon the widely used "rapid assessment procedures" for health programs, which tend to focus on individuals as the locus of behavioral change. Instead, we sought to better understand how individual households fit within complex social and political contexts. Our approach was less concerned with how individual households fared, and more with the overall sociopolitical context and impact of the program.

We interviewed a total of sixty-four individuals in four of the six pilot communities. Interviews ranged from forty-five minutes to three hours in length. A number of initial working hypotheses contributed to the shape of the interview guide used in the field. We attempted to obtain the same basic information from each informant without restricting the flow of other information that might illuminate hygiene beliefs, water practices, or the overall social dynamics of the communities. We did not want deliberately to limit the research to only what we could imagine, prior to the study, would be relevant. In other words, by following a semi-structured approach, we left room in the interview encounter to capture other information that our informants felt would be relevant for understanding the issues raised. The semi-structured approach also gave each member of the team leeway to address questions whose answers informants could not or would not readily provide. The intervention had opened very private matters of household and personal hygiene to external scrutiny and evaluation. Informants often expressed reluctance, embarrassment, or shame in discussing some critical areas of the program's effectiveness. Thus throughout each interview we returned to complicated or uncomfortable issues, posing the same question several different ways in order to obtain the most accurate information or complete picture of each issue the interview sought to address.

Results

Any model presumes a certain degree of homogeneity or constancy in real-world settings. The community health promoter model is no exception. As its name suggests, the community health promoter model presumes foremost the existence of a community. While the literature guiding community health promotion rarely probes what the nature of a community must be for successful application of the model, literature in anthropology has shown that "community" is a continually contested feature of social life. In fact, studies of community development, conflict, and change have shown that community, rather than being the basis of affiliation and cohesion, is often the very thing that people argue about. Who belongs to a community, how differences of status can be overcome, where community development should lead, and what constitutes the physical boundaries of community are issues that are consistently in dispute. Thus it is these arguments, disagreements, and dialogues—rather than some transcendent or preexisting cohesion—that define community. Rather than a setting peopled by residents with an established or assured affinity, community might better be understood as a process, something undergoing continual formation and transformation.

The following section presents only a portion of our findings. Most notably, it does not discuss understandings of and social attitudes toward diarrheal disease, which are covered in Hill 1996. For a complete discussion of the project's research methods, hypotheses, and findings, see Agua Para Beber 1997.

The anthropology literature showing community as a site of contest has a long intellectual history; see Firth 1957; Gluckman 1955. Also relevant here is work that addresses how communities are invented through affiliations that do not have a necessarily spatial expression; see Young 1990.
The six settings of the Agua Para Beber pilot program were called "communities" by Agua Para Beber coordinators and by residents of these areas. However what "community" meant, both as an idea and in practice, varied broadly among and within each of the four settlements studied in the summer of 1996. These differences bore significantly on both the implementation and the outcomes of the intervention, in large part because the nature of allegiance was eminently political and reflected exercises of power among community members. In some cases the politics of community order and disorder were explicit. In others, particularly in El Paso County, "anti-politics," or the politics of neglect, shaped the intervention's outcome.

Colonias populares in Mexico historically have emerged from and been formally integrated into party politics (see Eckstein 1977; Cornelius 1975; Price 1973). The allocation of residential real estate for poor people and of urban services, including water, has occurred through explicitly political channels. Illegal settlements are traditionally organized into voting blocs in exchange for service delivery by the dominant Institutional Revolutionary Party, or PRI (Eckstein 1977). So effective has this form of governance proven in Mexico that even the opposition National Action Party (PAN) mined its utility throughout the 1990s, the decade in which the PAN controlled the mayor's office in Ciudad Juárez. Even when settlements are thwarted in their efforts to obtain legal tenure and services, they nonetheless work their petitions through party organizations.

By contrast, colonias in El Paso County (and throughout Texas) are initially the product of political neglect, and they retain their underserviced character through isolation from formal (that is, party) politics. In their exploration of the ongoing failure to deliver public works to colonias in El Paso County, Lopez and Reich (1997) show that elected officials (both Democratic and Republican) deny the political nature of service delivery. Such denial thus legitimates continued withholding of services. Alienated from formal politics, the lack of sanitary infrastructure takes on a more explicitly anti-political cast for residents. Nonetheless, such depoliticization, as James Ferguson (1990) has shown for southern Africa, needs to be understood as political. Moreover, both anti-politics and politics are legitimated culturally, and they produce cultural effects. That is, politics are understood and integrated into the daily experience of water shortages and unreliability in ways that seem not to be political for colonia residents on both sides of the border.

Neither politics nor culture alone shaped the outcome of the Agua Para Beber program. The physical landscape of power and politics also bore significantly on participants' inclinations to adopt and maintain practices advocated by the intervention. Additionally, evaluating the program's effectiveness in light of power and its landscape illuminated how the program was effective in ways quite unanticipated by the pilot program's architects. In addition, the approach sheds light on how the program can enhance its effectiveness in the future in the most politically challenging of settings.

Palo Chino: Strategic Communal Learning

Palo Chino, the first Ciudad Juárez settlement evaluated, seemed to present what might be considered ideal circumstances for program success. A small settlement on a southeastern flank of the Sierra de Juárez, Palo Chino straddles a narrow valley such that almost all two hundred homesteads are visible to one another. Palo Chino was founded by an unscrupulous landbroker ('líder') who had run newspaper advertisements announcing lots for sale. After families purchased the lots, the broker vanished and promised services never materialized. Families initially relied on water from a standpipe in the adjacent community and then on trucked water until the time of the pilot program. Although the settlement did not appear to have any political alignment prior to its inception, a very charismatic resident who had initiated efforts to pressure the city for services was soon won over to the PAN city administration. Within a short time, he organized a neighbors' committee (comité de vecinos), the PAN's answer to the national government's eminently political "Solidarity committees" in under-serviced working-class settlements. The committee demonstrated remarkable resolve. By the summer of 1996, in addition to administering Agua Para Beber, it had built a primary school, secured water lines for most of the community, and obstructed illegal encroachment on a vacant area that had been set aside for sports fields at the northern crest of the valley. A large portion of the community participated in the committee in 1996 or had participated actively in the past.

Volunteer promoters were recruited through a committee meeting. Interestingly, of the seventeen initial volunteers, six were men. Given that the promotion required very delicate discussions with female caregivers about hygiene practices, such pronounced involvement by men would not appear to be ideal. However, those men who did par-

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Note: The text contains a note that refers to the community having a thriving neighbors' committee, which was established and led by a charismatic leader who had initiated efforts to pressure the city for services. It is not clear if all those participating were PAN supporters. In fact, it appeared that the leader's charisma, rather than party politics, drew residents to engage in community affairs. Nonetheless, their participation did serve political ends. On PAN community-level politics and organizing, see Rodríguez and Ward 1995, 1992. On líderes in Ciudad Juárez, see Ordoñez Barba 1997; Cornelius, Craig, and Fox 1994; Dresser 1991.
The training thus offered a measure of status to promoters by equipping them with notable command and respect within the community. In the end, only eight of the volunteers (four women and four men) remained for the duration of the pilot program.

Promoters had been instructed to select families with the greatest apparent level of necesidad (need). Necesidad is a term of much social and cultural significance in Mexico. In poor areas it has come to legitimate certain kinds of grassroots organizing (Díaz Barriga 1996). However, describing families as “de necesidad” (in need) slots them within a particular stigmatized social class—the very poor. When promoters described the families that they trained as “gente de necesidad” (needy people), they made important, ranked social distinctions between themselves and the families to be trained. The Agua Para Beber materials served as potential prizes in neighborhood political games. Thus, for example, some families believed that they had been selected because they went to committee meetings. Nonetheless, board members (the male promoters) might have felt that they could only promote the project to families they knew; otherwise they risked violating sensitive social mores. Because the promoters were obliged to discuss delicate issues of bathroom sanitation and childcare practices, the male promoters needed to select families within their existing social orbits in order to avoid provoking undue shame and embarrassment.

Some of the women also expressed reluctance to select families based on the criteria given them by Agua Para Beber trainers, because they felt uncomfortable venturing too far beyond their immediate social circles. Some felt uncomfortable communicating all of the critical hygiene information. Others believed that portions of the information were meant “just for the promoters and not for the families.” The training thus offered a measure of status to promoters by equipping them with knowledge that could be parcelled out or reserved as markers of distinction from their neighbors. Nevertheless, several promoters closely followed the instructions of the training. One, for example, selected families living at the upper edges of the settlement, where the houses demonstrated the greatest outward appearance of poverty. Because water pressure dropped dramatically on the higher slopes, these families struggled with water supply on a daily basis. This promoter estimated that half of her families continued to practice behaviors at the household level. Thus the follow-up study in 1995 did not measure the significance or community impact of the program but the resiliency of changed behaviors by household caregivers, typically women. Nonetheless, transferring to female caregivers the responsibility for environmental conditions for disease prevention produced very ambivalent consequences. For example, residents in all communities spoke about diarrhea only with reluctance and hesitation, making it difficult to measure reliably the impact of the program on curtailing incidences of diarrhea. There are other ways, however, in which Agua Para Beber appears to have helped bring about important changes in Palo Chino. Because of the tight political organization of Palo Chino, community leaders and the promoters were able to convert this health intervention into something that enabled them (in their view) to achieve infrastructural improvements.

At the time of the intervention, the community had been lobbying the mayor’s office to install piped drinking water. Armed with the knowledge from the intervention that dependence on pipa water contributed to diarrheal disease, community leaders were able to recruit greater participation from within the community to pressure city hall. The political pressure strategy shifted to incorporate information about disease that had been learned through the intervention. In contrast to the lack of reporting of diarrheal disease on an individual family-by-family basis, protesters asserted to city hall that the community suffered high incidences of diarrheal disease. Whether or not this affected the administration’s decision to extend water lines to the community cannot be easily determined. However, it is likely that the success of the residents’ strategy, in their view, contributed to their overall positive regard of Agua Para Beber and their willingness to continue following the lessons learned in health and hygiene. Deciding on a community resolution (rather than merely a household resolution) to water security prompted community leaders to consider the problem of sewer lines as a community undertaking as well. This impact has been long-lasting. In the summer of 1996 the community began to campaign for connections to the city’s sewage collector system.

Anapra: The Politics against Community

If Palo Chino epitomizes the ideal setting in which environmental learning can become a communal endeavor, Anapra stands as its polar opposite. All of the factors that contributed to the successful impact of Agua Para Beber in Palo Chino were absent in Anapra. Anapra’s geography, its division into numerous political factions, and its social atomization would seem to offer little promise of a successful intervention. Remarkably, however, the Agua Para Beber inter-
vention was effective in notable ways, particularly in light of the very limited resources with which residents had to work.

In 1996 Anapra was quite extended and thinly populated in comparison to Palo Chino. It spread over dozens of sandy, hilly acres in the far northwestern quadrant of the city, abutting the town of Sunland Park, New Mexico, on El Paso's western side. By all accounts there were three political subdivisions to Anapra, each one under the charge of a leader who was in dispute with the opposing leaders over the political allegiance of all of Anapra's population. House lots tended to be larger than in other areas of the city, placing families at much greater distances from one another than in Palo Chino. There were many vacant areas between lots, and the roads were quite wide (between 10 and 15 meters across). Indeed, many families moved to the area because of its openness, comparing it favorably to more densely populated areas like Palo Chino. However, the openness carried costs. Bus service, especially to the most remote areas of Anapra, was irregular. During the rainy season (when the interviews were conducted), friction between families became pronounced as washes spontaneously opened and houses and outbuildings were swept away. Residents complained that neighbors absconded with household goods that wound up in the streets after these flash floods. Few residents seemed to have a clear mental map of the whole area. Street names were largely unknown, and residents struggled to tell us how to get around and how to find specific landmarks.

The political divisions and competition between factions that characterized Anapra appeared to stem in part from the city's insistence that only one community organization could represent the whole of Anapra. This raised the stakes: whichever of the contending leaders emerged triumphant would have dominion over a vast region with several thousand residents. In the meantime, a long-term stalemate between residents, competing leaders, landowners, and the city government had stifled progress in the area since its first settlers had arrived some twenty years earlier. (Resolution of land ownership must be accomplished few of the program's goals. They distributed the materials and containers to friends and families only, and they remembered little if any water purification or hygiene information. In general, we encountered considerable distrust and resentment toward all three of the current leaders. For example, residents of one zone suspected that their leader had misused community funds, donated by residents for a clinic, and cheated them in other ways.

Anapra posed another significant challenge to the program's implementation: the condition of the water. Three wells provide Ciudad Juarez with its drinking water. Water drawn from the well supplying Anapra residents (provided by pipas) turned yellow with the addition of chlorine. The Agua Para Beber containers soon became stained in a range of colors from rust to black. This so alarmed residents that they became convinced of the imputed dangers of trucked water and began buying purified water. Despite the significant political impediments to the program, Agua Para Beber trainers organized a local committee out of the three factions. The leaders with whom we spoke appreciated the program, but they complained that they had had to share it with their competition. Some of the leaders who were involved in the program as promoters accomplished few of the program's goals. They distributed the materials and containers to friends and families only, and they remembered little if any water purification or hygiene information. In general, we encountered considerable distrust and resentment toward all three of the current leaders. For example, residents of one zone suspected that their leader had misused community funds, donated by residents for a clinic, and cheated them in other ways.

In all its pilot communities, Agua Para Beber made use of the existing community organization to implement the program. However, because Anapra had three committees, the factious community leaders played more prominent roles as promoters, with predictably unfortunate consequences for the quality of the program. Agua Para Beber trainers organized a local committee out of the three factions. The leaders with whom we spoke appreciated the program, but they complained that they had had to share it with their competition. Some of the leaders who were involved in the program as promoters accomplished few of the program's goals. They distributed the materials and containers to friends and families only, and they remembered little if any water purification or hygiene information. In general, we encountered considerable distrust and resentment toward all three of the current leaders. For example, residents of one zone suspected that their leader had misused community funds, donated by residents for a clinic, and cheated them in other ways.

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San Elizario: Environmental Stigma

Published reports, studies, and media accounts showing shanties and shacks as “typical” colonia residences might lead a casual visitor to expect all colonia residents in Texas to be uniformly poor, immigrant, and uneducated. In fact, we found a great deal of heterogeneity in the two U.S. colonias revisited in the summer of 1996. While there are many poor and poorly educated colonia residents, there are a large number who do not conform to this stereotypic characterization. For example, the vast majority of the participating families interviewed in the evaluation had had indoor plumbing and secure water supplies in a previous residence. Some residents came from solidly middle class backgrounds in Mexico (owners of small businesses, for example), and others had moved to the colonia from fully serviced rental residences in the city of El Paso. While indoor plumbing is not necessarily a proxy for educational level or class standing, it does suggest that the conditions found in the colonias of El Paso County are the exception, not the norm, in the life experience of residents.

Moreover, whereas such accounts and the results of the 1995 follow-up study suggest a lack of concern for water quality and safety (with only 38 percent of residents continuing to purify), our interviews revealed quite a different picture. The 1995 follow-up study relied principally on testing for residual chlorine in stored drinking water. However, the 1996 evaluation showed that 72 percent of participants claimed to take some steps to assure drinking water security. Some chlorinated regularly (21 percent), and 27.5 percent purchased water on a regular basis. Concern over drinking water had guided residents’ behavior from the beginning of their tenure in the colonias.

The changes derived from the Agua Para Beber program in Ciudad Juárez were notable; the changes in El Paso County were decidedly more subtle but nonetheless important. Significantly, the 1996 evaluation revealed that much environmental learning had already taken place among U.S. colonia residents prior to the intervention. The evaluation thus illuminated ways in which Agua Para Beber could enhance existing processes of environmental learning or extend environmental learning into areas of the community that were so isolated that residents could not marshal social resources to protect their health.

San Elizario is an unincorporated city atop the Rio Grande floodplain in southeast El Paso County. Originally settled during the Spanish colonial era, for most of the twentieth century San Elizario was a small agricultural community specializing in cotton. Between twenty and thirty years ago, farmers began subdividing exhausted farmland and selling small, unserviced parcels in various developments. San Elizario now counts a population of tens of thousands in more than a dozen such “colonias.” Two old farm roads run between functioning cotton fields and residential areas. The city is a patchwork in terms of density, with some heavily populated areas and some very sparsely settled areas of relatively isolated houses.

There are several elementary and middle schools and one high school in the consolidated school district. Two well-known preventive medicine clinics also service the community. Residences range from very small, dilapidated trailer homes to solidly built frame and cinder block or brick homes. Most residences have been owner-constructed over time. Many sandy lots feature modest patches of green lawn and flower beds partially shaded by young leafy trees.

San Elizario presented much more varied political, social, and institutional relationships among its residents than those prevailing in Ciudad Juárez. Deep social and class divisions—between “legitimate” long-term residents (of several generations) and “newcomers”—create notable fractures within San Elizario. Residents who claim generations of family residence expressed open hostility toward the residents of what they derisively called “las colonias.” Colonia residents were alleged to be the source of San Elizario’s social problems, such as gangs. This kind of animosity likely contributed to Agua Para Beber’s impact in San Elizario.

Within the colonias themselves, there was nothing comparable to the neighbors’ committees of the Mexican colonias. Promoters were recruited through a community health promotion training program. This “community organization” differed markedly from the community organizations of Ciudad Juárez. San Elizario residents (at least those interviewed in this study) did not appear to be consistently involved in any kind of social networks apart from their extended families, many of whom did not live in the immediate vicinity. Varied immigration status among and within families might obstruct organized political or social activities.

All the families interviewed knew, prior to moving to their lots, that they would not have piped water, probably for some time. Thus all had figured out how they would meet their water needs. Families in San Elizario typically had wells, although not a single family claimed to drink well water. A few families did cook with well water, but most used it exclusively for nonpotable purposes. Some families even expressed reluctance to use well water for washing clothes. Participating families described well water as salty (suggesting that they had tasted it at some point). Some promoters insisted that poorer residents must drink well water, and they perceived this as a signifi-

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*This knowledge of social structure in San Elizario is drawn in part from author interviews conducted in San Elizario in 1994. Further evidence of animosity on the part of longtime Mexican Americans toward “Mexicans” can be found in Vila n.d.
categorically that well water was undrinkable. When asked what they
did when they ran out of drinking water, informants told us that they
turned to their neighbors for a *galoncito* (a gallon jug) rather than
drink well water.

Families typically obtained their drinking water from one of the
large lumberyards in the area, from family members living in areas
served by city water, or from a churchyard's standpipe. Less than half
of the participating families purified the water they collected from
these sources. Some insisted that procured water was already suffi-
ciently chlorinated because it came from city pipes; it already tasted
strongly of chlorine, they said, and it made no sense to add more.
However, many families also bought bottled drinking water and thus
did not drink water collected from other sources. Some caregivers
noted that the kind of water consumed varied by the age and status of
persons within the household. In many cases babies and toddlers
drank purified water, while older children and adults drank water
brought from other sources and stored in an array of containers.

Several families resented having been selected for the promotion
and emphasized that, although they were poor by U.S. standards,
their impoverishment differed from that found in Mexico. As one
participant expressed it: “people think we are poor because we live in
colonias, and in Mexico only poor people do not have water or
plumbing.” Such resentment, whether expressed or not, may have
contributed to families' reluctance to adopt the changes advocated by
the promotion, because they did not see themselves as the kind of
people (poor and Mexican) who needed hygiene education. Begrudg-
ingly, however, some caregivers noted that hygiene information is
useful even when unsolicited—and even when accompanied by the
premise of poverty that colonia residents strove so hard to over-
come. Most families continued to use the *Agua Para Beber* receptacles
and commented that the safety features of the vessels were important.

The lack of drinking water and sewerage in colonias is an artifact
of politics, which can project a negative social construction onto resi-
dents (Lopez and Reich 1997: 158). Residents' sensitivity to such pro-
jections was evident in the stigma associated with well water and the
lack of piped drinking water. In meeting their water needs, residents
sought to overcome the stigma of poverty that most felt was an erro-
neneous representation of who they were. By going door to door, pro-
moters clearly offended some residents' sensibilities.

Residents demonstrated resourcefulness not only in overcoming
the stigma of poverty but also in educating themselves about water
quality. Because they had moved to San Elizario with the knowledge
that their new residences lacked drinking water, they had already
undertaken important steps in the process of environmental learning.
They had solicited advice and information from friends, kin, and
neighbors about where sources of drinking water might be found,
how best to transport and store water, and so on. All residents with
whom we spoke had carefully planned, before moving, how they
would obtain drinking and general-use water. The evaluation re-
vealed how *Agua Para Beber* might enhance that ongoing process by
identifying truly isolated families and by noting that an important
insertion point might be the location where families draw their wa-
ter—at lumberyards and church dispensaries, for example. On Satur-
day mornings, long lines snaked around the parking lots of the area’s
principal building supply company as residents patiently waited with
their jugs, barrels, and other containers. There they no doubt
swapped information on any range of subjects, including water. With
a captive audience awaiting drinking water, *Agua Para Beber* could
deliver important hygiene information while avoiding some of the
pitfalls associated with the house calls practiced by the intervention.

Montana Vista: Social Atomization

Whereas the colonias of San Elizario had grown up around a 400-
year-old town center, settlement in the northeastern quadrant of the
county (the second area chosen for the pilot program) had occurred
only in the previous twenty years. As in San Elizario, no one particu-
lar political, social, or institutional entity seemed to dominate the
area. Existing services within the area where *Agua Para Beber* was
implemented included a health clinic, an elementary school, a middle
school, a high school, and a community center, which opened in
spring 1996.

Like their neighbors closer to the international border, these colo-
nias presented more complex water and social circumstances than
had originally been anticipated in the pilot program, or than were
found in Ciudad Juarez. Montana Vista is even vaster and more
sparsely populated than San Elizario. The region (which is called by
several names derived from the original real estate settlements) is
marked by numerous platted but as yet unsold lots scattered through
many separate developments lacking city water and sewage lines.
Thus the area’s population of 17,000 could increase dramatically in
the next few years. In 1996 land sales were sluggish, thanks to two
state moratoriums, one on sales of lots measuring less than one acre
and the other against the Homestead Municipal Utility District.

The region’s confusing nomenclature reflects its complicated ac-
cess and entitlement to water. Several municipal utility districts
(MUDs) control water rights. The MUDs have various kinds of rela-
tionships with the major landowners and brokers. "Homestead" is the name given to the area where most of the Agua Para Beber promotion took place, because it was the Homestead MUD that supplied water to the lots after purchase. Unlike their counterparts in San Elizario, the residents of Homestead assumed that they were buying lots that would be supplied by piped water, and a good proportion of the area residents have, in fact, enjoyed piped water since first establishing residency. However, because the Homestead MUD was placed under a moratorium around the time when many of the lots were sold, new residents have been denied the water connection they paid for in their higher lot price (in comparison to San Elizario, for example) and, in many cases, in deposits for connection fees.

Those unfortunate households that did not get their connection before the moratorium went into effect relied primarily on water trucks to fill large tanks (plastic or galvanized metal, usually holding between 1,500 and 2,500 gallons) that families purchased and set near their homes. The water companies were charging between $22 and $25 every time a truck filled a residential tank, regardless of tank size. In addition, many families purchased bottled water or water from the reverse osmosis machines in stores and free-standing kiosks along Montana Avenue (the main artery to El Paso City). Overall, families paid up to $150 a month to meet their water needs, a cost (and a rate) far greater than the average ratepayer in El Paso County or residents of colonias in southeastern El Paso County.

Montana Vista has been very irregularly settled. Lots tend to be large (usually a half-acre) with much open space between them. Great empty areas of unsold real estate surround clusters of houses. Most commercial establishments are on Montana Avenue, with a couple of general stores located in the interior of the colonias. Most residents commented that any shopping or socializing requires a car. Residents, particularly those who had come from Mexico, complained of loneliness and isolation.

As in San Elizario, immigration status may be a significant factor in families' isolation. For example, some families were concerned that if they sought a legal remedy to the real estate company's breach of contract, they risked deportation. One resident told of a family that had been deported because it threatened to sue a real estate company. Residents feared that the companies kept records detailing which family members were legal and which were not (typically the male head of household is legal, while his wife and children might not be). We had no way of verifying whether these concerns were valid, but both the anecdotes and the worries illustrate what are the believed stakes in any social action around water issues. Well-publicized raids by immigration officials in other colonias in this area of the county in 1996 no doubt amplified residents' anxieties.

The program was implemented through a network of health promoters. Judging by interviews with the targeted families, some promoters were nearly ideal but others reflected the least desirable qualities in a promoter. The differences were apparent in the kind of health, hygiene, and water knowledge retained by families trained by different promoters. One promoter, who found communicating the pathogenic processes of enteric illnesses embarrassing, admitted that she had relied on the weekly questionnaire to address sensitive household issues, especially bathroom hygiene. Instead of talking about these difficult matters, the promoter simply asked the participants the questions listed on the survey. Thus she failed to stress the importance of hygiene training, and her participating families retained little or assumed that they already knew all they needed to know about hygiene practices.

At the other end of the spectrum was a promoter who very conscientiously chose to promote to households that were within walking distance from her house and with which she could stay in close contact over the course of the intervention. In our interviews, we found that about half of her families were continuing to treat their water and could readily describe the fecal-oral transmission of pathogens. However, as in the case of the most thorough promoters in Palo Chino, not all of her families accepted the training and continued the practices.

Many families already had some kind of safe drinking water practice in place prior to the intervention because they had recognized that water kept in storage tanks for an extended period begins to smell or produce algae. Many had also heard rumors that the moratorium against the Homestead MUD had to do with water quality and that their well water was of suspect quality. Because the water trucks draw their water from these same wells, many families had already switched to regular purchases of purified water from vending machines. Even though bottled or purified water was expensive (at $.20 or $.25 a gallon), families routinely chose this option because of the "bad taste" of chlorinated water.

Unlike San Elizario, where environmental learning seems to have spread through informal connections among residents, residents of Montana Vista got their water and water information from what they considered to be a wholly unreliable source: the MUD. When asked what they considered unreliable water, caregivers responded that the water supplied by the MUD must be suspicious because the MUD threatened deportation. Thus those caregivers who had been trained by the more thorough promoters found the training useful and felt it gave them some control over certain frightening features of their environment. So isolated and atomized were women that the promoter became their principal source for information on how to achieve some measure of control over a very challenging water situation.
Lessons

The experience of each of these communities provides a distinct lesson in what Agua Para Beber can offer to residents of under-serviced settlements throughout the border region. But what can be generalized from these lessons? In Palo Chino, a charismatic community leader who fostered the right kinds of ties to the city administration could make use of an unusual topography that favored community collaboration. He successfully converted a household campaign into a community betterment strategy. In Anapra, the politics of community essentially thwarted the effectiveness of the intervention. Nonetheless, the dramatic changes exhibited in drinking water once chlorine was added stimulated many residents to begin asserting control over their water safety, at a very high household cost. Colonias in El Paso County present a wholly different set of environmental and social conditions. The fact that the residents are from a variety of class and educational backgrounds and vary in terms of their immigration status further complicates a picture of heterogeneous clusters of developments. Even perception of risk varied across this landscape: residents in Montana Vista were ready to regard their fraudulent utility district as the source of danger, whereas residents of San Elizario had learned that danger lay in their own individual wells. In addition, risk perception in San Elizario was compromised by residents' aversion to being categorized as poor, while in Montana Vista, differential enforcement of immigration policy made the politics of water allocation even more pronounced for residents.

The vast differences within and among the four communities do not mean that every success or failure of a program like Agua Para Beber is idiosyncratic. Rather, the most important lesson gleaned from this study centers on the nature of environmental learning, rather than on any intended or unintended outcomes. By paying attention to political ecology—that is, how power relationships act upon varied community landscapes—Agua Para Beber learned to develop more sustained effectiveness in helping caregivers understand that there are means to assert control over their environments. Moreover, where it was most effective, the intervention showed caregivers that the means of environmental control can change over time as other features of political ecology change. Importantly, by stripping an environmental intervention of its individualized tendencies (such as happened in Palo Chino) or helping residents to see that they are not to blame for their circumstances (as in Montana Vista), Agua Para Beber can open a channel for passing along important hygiene information.

At the beginning of this chapter, it was noted that Agua Para Beber's 1996 evaluation demonstrated the important difference between what is taught and what is learned in an environmental intervention.
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