

Third World Problems in California?
A Case Study of Drinking Water in Tulare County

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INTRODUCTION

Water is likely to be a defining policy issue in California during the course of this century. For a state whose economy depends largely on agriculture, water is a treasured resource. For its approximately 30 million inhabitants, water is essential for meeting livelihood needs. Despite these foundational need, however, the supply of clean drinking water is not universal throughout California. In unincorporated communities throughout the state, both access to and quality of drinking water can be a problem (Laurel Firestone, personal communication, April 18, 2005). Thus as Ortiz comments “in the most prosperous state of the richest nation in the globe, there are towns with Third World problems” (2004).

These “Third World problems” are said to exist in the Central Valley’s, Tulare County, one of the largest growth-generating counties in the state, in terms of agriculture. According to Tulare County’s Department of Finance, approximately 62%¹ of the population lives in unincorporated communities (TCAG 2005). Sixty-five percent of the 19 communities or towns in the County have more than 30% of the population living in poverty. One can speculate that a majority² of the poorer communities have problems regarding access to clean drinking water (TCAG, 2005 and Laurel Firestone, personal communication, April 18, 2005).

In general, Tulare County’s 19 localities are expected to see an increase in population, ranging from .1 to 3.7% growth (TCAG, 2005). Thus, the problem of adequate access to clean drinking water will be important to consider. The problem itself, however, is multi-faceted and should be divided into several areas: 1) Degree of water service coverage, 2) Degree of adequate infrastructure, 3) Efficiency and equity of water pricing, and 4) Quality of water provided.

Because the degree to which these factors affect rural, unincorporated communities in Tulare County may vary it is important to consider all four areas. Beginning broadly, one can ask: What are the factors that are likely affecting water service coverage in Tulare County? What factors should be considered when considering the financing of water infrastructure in these communities? How should water be priced, and the quality ensured and paid for?

¹ As of the 2000 Census, 227,183 people, out of 368,021 lived in unincorporated communities.

² A future study by the author will determine the exact number.

From an economic perspective little information exists regarding how to answer these questions for First World countries, like the United States. Interestingly, the literature on these issues in Third World countries is more bountiful. For example, consider Snell's comments on water services in the Third World:

Peri-urban communities are the last to receive services from water and sanitation utilities. Still, as in all types of communities, their residents must every day find water for drinking, cooking, washing, and bathing, and must choose where to defecate and urinate. Even where piped water and sewerage networks do reach into poor neighborhoods, home connections are often unaffordable. Municipality-operated public standpipes, public toilet facilities, and public baths are usually poorly maintained if not out of service entirely.

Additionally, Collignon (1999) notes that national water companies in Africa seldom supply water to rural communities, because such communities are "not considered profitable and require cross-subsidies."

Thus, a high percentage of rural populations obtain water service from informal suppliers.

In a study of unincorporated Texas *colonias*, Olmstead (2004) provides some of the first foundational work in this area, as applicable to the United States. *Colonias*, which in Spanish mean "residential area" or "settlement", are used to refer to unincorporated subdivisions in Texas that lack basic infrastructure such as public utility connections, roads and other key services (Olmstead 2004). In her study, *Thirsty Colonias: Rate Regulation and the Provision of Water Service*, Olmstead not only describes the barriers that poorer *Latino* communities in Texas face regarding adequate water service coverage, she provides an econometric analysis of the key factors that significantly affect the coverage.

The following paper considers problems regarding barriers to adequate water service coverage *and* clean drinking water, by focusing on a case study of Alpaugh, one of the many unincorporated communities facing water challenges in Tulare County. While Olmstead focuses mainly on *water coverage*, this paper explores the potential for applying parts of Olmstead's (2004) framework of analysis towards the drinking water problems facing Alpaugh, and the greater Tulare County, which includes issues of coverage *and of water quality*. At its core, this paper is a preliminary exploration of how to better understand water access problems in the Central Valley. It is the hope that this paper can provide a foundation for future research by the author.

With these thoughts in mind, the paper explores the following topics and questions: 1) What is the history of domestic water service in Alpaugh, and what trends and lessons emerge?; 2) How can

Olmstead's findings on Texas *colonias* be used to consider problems facing Alpaugh, and the greater Central Valley community?; 3) Besides Olmstead's economic analysis, how can the fields of environmental justice and city planning be used to shed additional light on the issues at hand, and provide preliminary recommendations? The paper is organized into three main sections, focusing on each of these questions.

PART 1: Water Service and Water Quality in Alpaugh, California

From 2002 to 2004, the reality of drinking water in Alpaugh made Southern California's headlines (Kelley 2004). Due to both faulty wells and contaminated groundwater supply, the residents of Alpaugh found themselves without drinking water for weeks at a time. In an exemplary display of community activism, the residents of Alpaugh, led by resident Sandra Meraz, fought to receive state funding to provide new infrastructure for drinking water. The following section tracks this history, and outlines the key trends that emerge.

Alpaugh is an unincorporated community in Tulare County, with a population of 761 residents (US Census 2000). The unemployment rate in the community is 17.2%, and the median income is \$23,688 per household³. Roughly 54% of the community is Latino and 36% is White. The remaining 10% is composed of Asian/Pacific Islanders, Native Americans, and African Americans. Of the 223 occupied housing units in Alpaugh, 60% are owner-occupied, and 40% are renter-occupied. The median rent in the community is \$435 per month. The median mortgage is \$487 per month.

Two relevant water agencies exist in Alpaugh, the Alpaugh Irrigation District (AID) and the Tulare County Water Works District (TCWD). AID was organized on February 19, 1915. Since this time, AID has owned the water lines outside the community, and supplied water to both agricultural and residential users. Outside of the township, AID has about 135 service connections (TCGJ, no date). Since August 6, 1919, the TCWD has served as a non-profit water district that provides infrastructure and water services to Alpaugh. While TCWD owns the lines within the township, historically it contracted with AID for the maintenance and operation of those lines (TCGJ, no date).

Until 2000, residents of Alpaugh paid a flat fee of \$20 per month for their domestic water. In the fall of 2000, however, AID attempted to increase water rates, from a \$20 per month flat-fee, to \$72 per

³ In 2000, the official median poverty level was an annual income of \$17,463 for a family of four. Census 2000.

month⁴. Outraged by this lump sum raising of prices, residents of Alpaugh, with the help of Legal Aid lawyers, sued and reached a settlement agreement of a \$45 per month flat rate. Citing “skyrocketing” electricity bills (during California’s energy crisis) and the inability to have raised rates to \$72 per month, in August of 2002, AID filed for bankruptcy (TCGJ, no date). This event coincided with a November 7th bill, Measure R that passed with two-thirds vote by Alpaugh residents. This special parcel tax consists of \$120 per parcel per year for residents served by the TCWD. The money was to be used to pay for improvements to domestic water systems.

Beginning in 2002, the drinking supply system in Alpaugh began to face considerable challenges. Until 2002, Well 9, which was owned and operated by the AID, was the main well used to provide domestic water to Alpaugh. Since 1975, Well 45 had been the back-up well for domestic purposes. On April 23, 2002, however, Well 9 broke, and the community began to rely primarily on Well 45. Unexpectedly, in August of 2002, Well 45 also broke. Water samples taken showed that both coliform and arsenic were present in the community’s water source. In fact, arsenic levels at Well 45 were at 87 ppb, far exceeding the 50 MCL (Sandra Meraz and Laurel Firestone, personal communication, April 18, 2005). Therefore, rather than fix Well 45, the Department of Health Services gave notice to use bottled water for cooking and drinking (TCGJ, no date).

With valiant community leadership, Alpaugh residents attempted to address the drinking water problems. On August 21, 2002, TCWD, Self-Help Enterprises and Sandra Meraz, one of Alpaugh’s key community leaders, spoke to State Representative Jim Costa and the then-Governor Davis about the need for fixing the community’s infrastructure and water coverage problem. In September 2002, Senate Bill (SB) 621 (Costa) was signed into law. The legislation was created to help AID and the Oakhurst water district. Under Section 1a of SB 621, \$2,100,000 were appropriated to the Department of Water Resources (DWR), from Proposition 13. Fifty percent of this sum was to be allocated to TCWD and the other fifty percent was to be allocated to AID. Section 1a also noted that this money would be awarded “for the purposes of working cooperatively on feasibility studies, or on the design, repair, replacement or construction of the domestic water supply and treatment systems and ancillary facilities operated and maintained by those

⁴ TCGJ report notes that the upper level was \$68/month.

districts”. A further stipulation, by the United States Department of Agriculture (USDA) was that AID and TCWD should become a joint powers authority, known as the Alpaugh Joint Powers Authority (AJPA).

In addition to the two million dollars, Alpaugh was able to secure additional sources of support while a new well (Well 10) was constructed. Because of the excess levels of arsenic in Well 45, in 2002, AID applied for an emergency grant, and received \$611,000 to build a well. United Farm Workers and Food Link, a food bank in Sacramento, arranged to donate water to schools. In 2003, TCWD applied for a grant with C-SET and received a \$12,000 grant which allowed for water distribution while Well 10 was being built. On August 22, 2003, Assembly Woman, Nicole Para donated \$32,000 (\$10,000 for school and \$22,000 for the community) for bottled water in Alpaugh. Included in this was a 5,000 gallon tank of water, known as the “watering hole”, that would provide bottled water two to three times per week and a stand for all kids, for grades K through 12. Finally, after Kelley’s Los Angeles Times article, which highlighted Alpaugh’s problems, the remaining money was donated to seal Well 10. Table 1 summarizes the history presented above, and the Appendix includes photos of key areas in Alpaugh.

Table 1. History of key water-related events in Alpaugh, California.

Date	Event
February 19th, 1915	AID is organized.
August 6th, 1919	TCWD is formed as non-profit water district.
November 7th, 2000	Two-thirds of Alpaugh residents vote for parcel tax that would pay for improvements to domestic water systems. At same time, AID attempts to increase water rates from \$20/month flat fee, to \$72/month.
Fall 2000	Residents of AID & TCWD, with help of Legal Aid lawyers, sue and reach settlement agreement. It is decided that AID can only increase fee to \$45/month.
August, 2000	Citing rising electricity costs, AID files for bankruptcy.
Through 2002	Until 2002, Well 9 was main well (owned and operated by AID at the time). Well 45 had been back-up well. Well 45 was back-up because it exceeded Maximum Contaminant Levels (MCL).
April 23rd, 2002	Well 9 breaks. Community moves to back-up Well 45.
May, 2002	United Farm Workers (UFW) asks Food Link to donate water to schools.
August, 2002	Water samples show that coliform and arsenic are present in the community's water source. In fact, levels of arsenic in Well 45 were at 86 parts-per-billion (ppb), far exceeding the 50 MCL. Because arsenic levels exceeded, Department of Health Services gave notice to use bottled water for cooking and drinking.
August 21st, 2002	Rick Sroka from TCWD & Self-Help Enterprises speak to Jim Costa (State Representative) and Sandra Meraz speaks to the governor about the drinking water problem.
September, 2002	Senate Bill 621 was signed into law. The legislation was created, in part, to help AID and TCWD. \$2,100,000 was appropriated to the Department of Water Resources (DWR), so that fifty percent could be allocated to TCWD and fifty percent to AID. A further stipulation made by USDA was that the two agencies (AID and TCWD) would become joint powers. Thus, the two merged to become the Alpaugh Joint Powers Authority.
Fall 2002	AID applies for emergency grant, and receives \$611,000 to build a new well (Well 10).
2003	TCWD applies for grant with C-SET and receives \$12,000 to distribute water to the community, while Well 10 is being built.
August 22nd, 2003	Assemblywoman Nicole Parra donates \$32,000 for bottled water (\$10K to school, \$22K to the community). Included in this grant was a 5,000 gallon tank of water to provide bottled water 2-3 times/week.
January, 2005	After an article is published in the LA times, community receives enough money to seal Well 10.
Today	Plans for a new well and metering are underway.

While today, residents of Alpaugh receive piped drinking water from Well 10, the community still faces a series of issues. First, contamination of the drinking supply continues. Meraz notes that even today, despite chlorination treatment, water is likely to be somewhat contaminated because of leaky pipes. Secondly, not all residents are paying for their water. Currently, only two-thirds of residents pay for the water, (Sandra Meraz, personal communication, April 18th, 2005). Third, because water is not metered, there is speculation that farmers are using the domestic supply for their fields. Meraz notes that some of these farmers use the domestic source of water to dilute chemical sprays, and they are only paying \$45 per month. In this sense, the domestic users are subsidizing farmer use of non-domestic purposes.

To remedy these issues, the community of Alpaugh is waiting for a new well to be finished, for a metering system to be installed, for eventual front-of-house installations, and for a new well to be constructed. The hope is that the meters will help boost reserves for maintaining the infrastructure. However, if financed traditionally, in and of itself metering will likely add further infrastructure costs to residential bills.

Using Alpaugh's story as an example, one can summarize some of the key challenges that poor, rural and unincorporated communities in Tulare County face today. First, these communities are likely to face political and institutional barriers to receiving adequate coverage and quality of water. Second, even where there is service coverage, these communities must grapple with economic questions regarding financing the costs of water infrastructure, and creating appropriate rate structures that cover costs and conserve domestic water sources. Third, these communities face health issues regarding the quality of the drinking water that are of paramount concern.

PART 2: An application of Olmstead's colonias study to Tulare County

Combining the aforementioned issues with the limited literature on similar problems facing colonias, the consideration of the factors that should be considered in terms of water service coverage and quality in low-income, rural communities becomes more robust. For this, it is helpful to move away from California and look at the Texas *colonias*. Upon doing so, one finds that the colonias offer striking parallels to rural unincorporated communities in Tulare County. And, Olmstead's applied economics analysis of the

colonias' water problems offers key insight for considering the driving forces behind the provision of water services.

Found in Texas and the Southwest, *colonias* are low-income housing areas in low-density peri-urban settlements, where land is acquired cheaply and basic services such as running water are usually lacking. These communities are mainly Mexican-American, are often neglected and ignored by the government and face a prevalence of environmentally-caused diseases and weak community organization structures (Ward 1999). As Ward suggests, these colonias are “located in an administrative no man’s land” where, “falling beyond the city’s limits, [they] are like “Third World” settlements in the world’s richest nation” (Ward 1999).

While the manner in which colonias form may differ from unincorporated agricultural communities of the Central Valley, a common list of factors makes the two types of communities comparable. Specifically, not unlike the colonias, the poorer rural and unincorporated Tulare County communities are predominantly peri-urban⁵, they are often forgotten by local and state government agencies, and they have poor infrastructure. And, for both Texas colonias and unincorporated communities, like Alpaugh, a key public policy question can be asked. Mainly: what determines whether essential services of water, power, public transport, and social service infrastructure will be provided to low income communities that are more geographically isolated and disenfranchised (Ward 1999)?

For water services, Ward (1999) attributes inadequate water service coverage in *colonias* to: 1) high infrastructure cost, 2) low utility revenue potential, and 3) weak political influence. Can similar factors be considered in the case of Tulare County? To answer these questions it is necessary to explore some of Olmstead’s key findings. By analyzing economic, institutional and political factors that affect water service coverage, Olmstead tests whether lack of service coverage is, in fact, influenced by the three factors that Ward suggests. Her findings, summarized below, offer important learning lessons that can potentially be applied to Alpaugh and Tulare County.

⁵ Peri-urban in the sense that they are near larger towns or cities.

Economic Considerations

First, Olmstead highlights the economic and financial factors that affect water service. She notes that absence of utility service in colonias is often attributed to a low ability to pay by low-income people (Olmstead 2005 and Ward 1999). Her analysis indicates that the potential for high infrastructure cost and low revenue reduce a colonia's likelihood of obtaining water service. Specifically, her econometric analysis indicates that "for every \$1000 increase in per capita income, a colonia's probability of water service...increases by 2.3%" (Olmstead 2004). This is a somewhat disturbing finding, given that in the Texas colonias and in the Third World, the poor often pay higher rates to informal suppliers than they would to public suppliers (Collignon 1999 and Solo 1999).

In Texas, the argument has been made that the cost of infrastructure is higher than the tax revenues a city would garner from taxes paid by colonia residents, and therefore annexation is not desirable, from economic or political viewpoint (Olmstead 2004, Wilson and Menzies 1997). And yet, communities are paying rates much higher than those in communities with central utilities (Ward 1999). This indicates that future financing arrangements for Alpaugh's water infrastructure should not assume that the residents will not be willing to pay for water services. Whether they should be asked to finance the full cost, however, is a question of social equity that will be discussed below.

While water service coverage already exists in Alpaugh, for the sake of other Tulare County communities, the above results are still important to consider. Olmstead's study suggests that income may be a good predictor of the likelihood of coverage. Second, since the problem in Alpaugh and other Tulare County communities is also one of quality of drinking water, this begs the question of whether Olmstead's findings can be applied to considering the likelihood of having *clean* water, not just *provision* of water.

Secondly, Olmstead's econometric analysis indicates that water suppliers not subject to rate regulation "appear to have been more proactive in providing water service to colonias within reach of their services areas than have municipalities, counties..." Specifically, her results indicate that a regulated provider reduces likelihood of obtaining service by 27% in colonias. Therefore, Olmstead concludes that at least temporarily, "rate regulation may do [poor communities] more harm than good in the absence of a

universal service mandate”. Thus Olmstead recommends that pricing flexibility be an option for service providers, to encourage service expansion⁶.

In terms of Alpaugh and Tulare County and the Olmstead’s results indicate that it is possible that water suppliers not subject to rate regulation may be the most efficient for communities such as Alpaugh. Certainly this brings up questions of equity: will such a supplier provide the most equitable rates? Would the service of such a provider be reasonable? Regardless of the answer, in terms of dealing with the basic problem of access to services, Olmstead’s point is important to consider.

A final economic consideration that Olmstead highlights is the host of additional opportunity costs that face rural poor, in terms of water coverage. Olmstead notes that residents of colonias must add additional costs to their already high priced bills. This may include the prices of water tankers, the time to obtain water when it is not available via infrastructure, and the impact on resident’s quality of life (especially in terms of health impacts). As indicated by Alpaugh’s history, when infrastructure was not available, residents of Alpaugh faced a very high opportunity cost of obtaining water. It is likely that other communities in Tulare County are paying for similar unaccounted costs. Water policies in the County should consider this factor.

Institutional Factors

In addition to highlighting economic factors that will affect water service, Olmstead speculates that there are several important institutional determinants of services. The main one she considers is the potential access that service providers have to federal and state grants and low-cost loans. As she notes, because infrastructure investments are not typically financed out of operating budget, the degree to which a supplier can tax, issue debt, and access public infrastructure subsidies is critical for financing water utility services. Olmstead’s econometric analysis indicates that a provider’s access to infrastructure does not significantly affect a colonia’s probability of obtaining service

This finding should be applied with caution to Tulare County. As indicated from Alpaugh’s history, access to state grants, such as Proposition 13 and Proposition 50 were critical sources of funding

⁶ This is ironic given that in cities, water rates are regulated with the aim of keeping rates within a reasonable range for poor households, this is a critical point to consider (Olmstead 2004).

for installing new wells. In terms of Tulare County, the importance of this finding may be that it indicates that a future California-focused study should investigate the significance of this topic.

Political Factors

Aside from the economic and institutional factors, Olmstead also emphasizes that though traditionally overlooked, political factors are also critical to factor in, in terms of water coverage. For one, the voting power of the community is essential. In addition, she notes that the degree of activism evident in the community is also a key force.

As seen in Alpaugh's history, community activism was critical for obtaining adequate coverage and a cleaner source of water. In addition, today Sandra Meraz sits on the local Water Board. As a political appointee, she is able to voice the community's concerns more directly. Are other communities in Tulare County this fortunate? Olmstead (2004), as well as Wilson and Menzies (1997), suggest that such a question is important to consider, in light of the apparent positive correlation with water service coverage.

Olmstead also notes that political resistance may block essential aspects of water provisions in unincorporated colonias. Gardner (1984) argues that residents who are already serviced may be resistant to being taxed to finance the infrastructure of others. Olmstead also notes that on a larger scale, a County may not be interested or willing to focus resources for smaller communities. One reason may be that the County may vary in its magnitude of the problem; if few unincorporated communities (or colonias) exist within a said County, there may be less motivation to provide services, as the economies of scale are not as large. Indeed, an additional finding from Olmstead's econometric analysis indicates that the larger a colonia is as a fraction of the County's total population, the greater the likelihood that a colonia will have, or will, acquire water coverage. In terms of predicting which communities in Tulare County are likely to have access to services, this is an important point to keep in mind. This is also a pertinent point to consider given that the County is currently working on its General Plan.

In sum, Olmstead's analysis provides several beneficial uses for Tulare County. First, her analysis allows one to consider the range of factors that are likely to affect unincorporated rural communities in the County. While her analysis focuses on water service coverage, it can be hypothesized that the results would be similar when considering access to clean drinking water in this area. The following table summarizes some of the key factors that Olmstead applied, and indicates the effect this factor will have a likely effect on

water service coverage (termed “correlation” in the table). It also serves as a first exercise summarizing how these factors are likely to play out in Tulare County. Its application is further discussed below.

Table 2. Summary of characteristics present in rural communities and how they may affect water service coverage. √= characteristic present. √*= unverified, but characteristic likely to be present, ?= unknown if characteristic is present, and should be further researched. Correlation= degree to which this characteristic will affect water service coverage.

	Correlation	colonias	Third World rural communities	Alpaugh	Unincorporated agricultural communities in Tulare County
<i>Characteristic of Water Coverage and Service Problem</i>					
Multi-dimensional problem	na	√	√	√	√
Higher percentage without water service	na	√	?	√*	√
Limited County regulations regarding service	-	√	?	?	?
Motivation for living in more remote area due to cheaper housing and/or credit	na	√	√	√	√
Decreased quality of life due to water quality/access	na	√	√	√*	√*
<i>Economic Characteristics</i>					
High infrastructure costs of expansion	-	√	?	√	√
Low utility revenue potential	-	√	?	?	?
Prices in informal sector likely to be higher		√	√	√	√
Residents face increased opportunity costs (e.g. travel time to obtain water)		√	√	√	√
<i>Institutional Characteristic</i>					
Lower likelihood of large-scale monopoly providing service	-	√	√	?	√*
Highly decentralized water service		√	?	?	?
<i>Service Characteristics</i>					
Suppliers in area act as virtual monopoly	?	√	?	?	?
Typical supplier has limited taxing or bonding authority	-	√	?	?	?
Supplier has internally regulated rates	-	√	?	?	?
<i>Political Characteristics</i>					
Community has weak political influence	-	√	√	√*	√
Community activism present	+	√	Depends	√	√
Political resistance by County	-	√	?	√?	√?
Political resistance by other taxpayers	-	√	?	?	?

Application of Olmstead’s Colonias Study

The previous sections outline some of Olmstead’s key findings, and attempts to extrapolate these findings to Alpaugh and Tulare County. As mentioned early on, however, several caveats must be

considered. The main one is the slight difference of focus; where Olmstead focuses specifically on water service coverage, the reality in Tulare County is comprised of a combination of factors, where both service coverage and access to clean water are important. While it is useful to consider how Olmstead's findings might apply to the context of having access to clean water, the extrapolation is not a clean one. In the end, the most useful aspect of Olmstead's analysis is her framing of the key questions. Regardless of whether the question is one of coverage, or quality of the water resource, the factors listed in Table 2 are likely to be important in both cases.

Future Research Opportunities

In relation to the above points, it is useful to outline potential future paths to study in more depth. First, one might consider conducting a study similar to that of Olmstead's. All unincorporated communities that face problems of access to clean drinking water could be surveyed. Olmstead's list of variables, ranging from income, to type of service provider, to percent of population out of the County population, degree to which provider has access to state grants and loans, etc. could be used as initial variables in econometric models. The variables could then be adjusted based on significance. Conducting such a study would allow one to understand, with greater precision, the factors affecting the noted Tulare County communities. With this knowledge, critical policy recommendations could be made.

A second area of research might involve a detailed financial analysis of metering in Alpaugh. As Olmstead highlighted, one of the critical economic factors to consider is a community's willingness-to-pay for infrastructure. By developing a demand curve for Alpaugh's domestic water supply and a cost curve for the Alpaugh Joint Powers District, one could arrive at a clearer assessment of the effects of metering. Depending on the shape of both the demand and marginal cost (supply) curves, one might find that there is a gain from metering due to increased revenues and increased water conservation, or that metering may make no significant contribution to increasing revenues and increasing water conservation.

As a review of the literature noted, few studies have focused on these issues in the United States. Rather than extrapolate from Third World realities, it would be useful to have an increased understanding of realities facing poorer communities based on studies conducted within the United States. The aforementioned studies could add to this understanding.

PART 3: Environmental Justice and Preliminary Policy Recommendations

While the above analysis offers a preliminary framework for considering questions of water service coverage and access to clean drinking water from an economic perspective, the analysis does not focus on policy recommendations. The following section considers a few policy considerations, starting with environmental justice considerations, and ending with a city planning perspective.

The fact that state water policies and debates are generally dominated by a “relatively small, homogenous group composed of agricultural interests, [and] urban water agencies” (Ramos 2003) suggests that the needs of rural communities are likely to be overlooked. As Ward notes, in Texas, colonias and the problems they face are continuously seen as “a temporary problem of dysfunctional urbanization and as a refuge settlement” (1999). Their role as “legitimate working-class communities and their contribution to economic and industrial development” have not been adequately recognized. Could not the same thing be emphasized for the communities in the Central Valley? At its core, such an environmental justice framework asks that issues of equity and access to a fair and just living environment, including access to a basic quality of services be advocated for. While a separate study may focus on environmental justice implications alone, one can consider a few key points, in relation to Olmstead’s conclusions.

Just as with the colonias, poor and rural unincorporated communities in Tulare County are likely to be easily excised from the debate on access to water services. As Ward (1999) notes, one Texas legislator noted that some colonias are “so remote that it would cost more to extend utility lines than the houses are worth”. According to anonymous sources, these arguments are similar to the ones being made in Tulare County. An Olmstead-like study for Tulare County could prove to be a powerful tool for disentangling such comments, and for looking from economics towards social equity.

Today, in the U.S., “adequate service” in regards to basic services is understood to mean the establishment of connections to central utilities. One example is the *rural electrification* projects that have connected rural communities to the grid, or state revolving funds for waste treatment (Ward 1999). Olmstead acknowledges such equity goals, and proposes that they might be best achieved if there is “a portfolio of different types of service provision”. Under such a portfolio, “it may be better to establish a low-cost, small-scale, water treatment system for a rural colonias than to guess, over a period of years, at

the precise nature of the subsidy required to entice a distant water provider to extend service”.

Additionally, Olmstead notes that “Placing a ceiling on prices, in the absence of requirement to serve poor communities, may be a barrier to service coverage, rather than a mechanism to expand coverage”

(Olmstead 2004). These suggestions are just one possibility of factoring in equity. Another, more extreme set of suggestions might start at a more fundamental level and consider how to ensure that poor communities are served with adequate drinking water, regardless of the portfolio provisions.

An additional area that can be drawn on to consider policy decisions might be the *Community and City Planning* perspective (Ward 1999). As Ward suggests, in Mexico upgrading and urban integration of the colonias exists. There, policies have sought to embrace self-help, small-scale interventions. Interestingly, during the 1990s, World Bank policy developed in the form of *New Urban Management Policy*. This policy promoted incorporating unincorporated areas into the fiscal and regulatory bases of cities, stimulate productivity (Ward 1999). Could such a framework be applied to the affected unincorporated communities in Tulare County?

CONCLUSION

Whether in Texas’ colonias, or the Central Valley’s Tulare County, Third World conditions exist in regards to water services in the United States. As with urban residents, for the hundreds of thousands who toil in the agricultural fields of the Central Valley, water is necessary for life. From a social perspective, it only seems right to work on these problems.

In 1989, the political efforts of community leaders and organizations in Texas paid off, with the enactment of the Colonias Water Bill. With an estimated \$696 million in funding for water and wastewater alone, this bill represented a comprehensive approach to working on the problems in the colonias (Wilson and Menzies 1996). Though wrought with problems, the bill and subsequent government efforts represented “a remarkable story in the history of public policy in Texas”, as there was a commitment to support “a quite poor and minority population [of Mexican Americans]” (Wilson and Menzies 1996). This monumental activity would not have been possible were it not for community leaders, open-eared state legislators and researchers that helped highlight the problem. This outlines some level of hope for Tulare County, and perhaps other areas in the Central Valley. With the work of local leaders, and the small body

of professionals working to address the problems of water in communities like Alpaugh, a more concerted effort at addressing the problems may be possible. In its preliminary analysis of the problems at hand, this paper highlights how disciplinary tools such as economics can be applied to unpack the pressing issues of water coverage and water quality. It is my hope to develop future academic studies that can further analyze the ideas presented in this paper, and lead to systemic solutions.

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