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An economic valuation of water connections under different approaches of service governance

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ABSTRACT

This study investigates how households value different water sources which include in-house and yard connections to water systems. Differentials in the value of in-house and yard connections across governance approaches (municipal, private and community-managed services) are also investigated. The empirical analysis involves estimating hedonic models of stated rental prices for a large sample of urban and rural households in Guatemala. Findings indicate that urban households value municipal and private services. Conversely, urban households do not value piped water when provided by a community-managed system. Rural households seem to be more concerned about the distance of their primary source than about the type of water source.

1. Introduction

Providing safe drinking water is a central pillar of many current development strategies in developing countries. In the last decade, a significant amount of resources has been invested in water infrastructure worldwide. The allocation of those resources, however, has been often political and has rarely taken into account economic values, presumably due to the lack of such information, particularly in developing countries. Estimates on the value of water services may help to design appropriate policies, economic incentives, and institutional arrangements that would successfully extend water services (see [4]). This study investigates the value that urban and rural households assign to piped water in Guatemala, a low income country where many households still lack access to water services.

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The hedonic price method has proved to be useful for eliciting the economic value of goods and services that are not traded in a market setting [4]. This method is commonly applied in developed countries to analyze housing prices that reflect the value of amenities provided at or near the home. However, hedonic studies are scarce in developing countries presumably because sales transactions are often infrequent and accurate data on housing prices are hardly available. Public records on transactions in the housing market are often inaccurate due to the fact that transaction prices tend to be underreported presumably to evade property taxes. Moreover, public records do not include properties that have been illegally acquired, which is commonly observed in some developing countries (see [7]). In light of these circumstances, housing prices stated by home owners may be the most reliable approach of tracking home value in some developing countries. Nauges et al. [17] provide a recent example showing that home-owner stated housing prices can be decomposed following a hedonic modeling approach in order to estimate the value of piped water supply (also see [25] for another example from Indonesia). Nauges et al. estimated the value of access to piped water in three cities in El Salvador as well as in marginal neighborhoods in four Guatemalan cities located within the department of Guatemala.[1] Their findings suggest that there are significant benefits in providing households with piped water.

Vásquez [23] provides another example of how a hedonic model of rental prices can be used to investigate household preferences for water services. Using a sample of 998 home renters in urban areas in Guatemala, Vásquez [23] estimated implicit prices of piped water under three management approaches: municipal; private and community-managed. The findings indicate that households value municipal water systems over private and community-managed water services. Vásquez [23] argues that differentials in estimated values may reflect potential variations in service performance and institutional arrangements (e.g., voluntary provision of inputs for system maintenance and repairs) across municipal, private and community-managed water utilities. In another related study, Vasquez [24] uses data at the community level from rural Guatemala and finds that municipal systems are perceived to be more capable than community-managed systems in providing water services. It could be argued that such perceptions may lead to higher willingness to pay for municipal services than for community-managed services, although Vásquez [24] does not estimate economic values for water services under different governance approaches.

This article provides estimates of the value that households assign to in-house and yard connections to water systems, as well as to public taps, well water, and other freshwater sources in urban and rural Guatemala. More specifically, hedonic models of rental housing prices are estimated using a nationally-representative sample of 12,476 households (4810 in urban areas and 7666 in rural areas). The sample includes households that own their own home as well as households that currently occupy a home they do not own (i.e., they do not pay rent). Rental prices used in this estimation are stated by respondents rather than observed in a market setting, as in Nauges et al. [17] and Yusuf and Koundouri [25]. Also, this study extends the work of Vásquez [23] by investigating how the type of water utility (i.e., municipal, private and community-managed utilities) may affect the value of both in-house and yard connections. This study also estimates how economic values of water services may differ in urban and rural areas. The latter has received little attention in the literature on economic valuation of water services until now. Findings indicate that urban households value municipal and private water supplies. In contrast, results indicate that urban households do not value piped water when provided by a community-managed system. In addition, rural households seem to be more concerned about the distance of their primary water source than about the type of water source per se.

The rest of this paper is organized as follows: Section 2 reviews the institutional framework and current conditions of municipal, private and community-managed water systems in Guatemala; Section 3 introduces the econometric approach used to estimate the value that households assign to

[1] For administrative purposes, Guatemala is divided into 22 departments (equivalent to States in the US). Then, each state is further divided into a total of 334 municipalities. It is worth noting that municipalities may consist of both urban and rural areas.