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The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 10 member countries: Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Viet Nam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to policymakers.

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Tapping Into Demand : A New Approach To Water Supply In Vietnam

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Providing a high-quality water supply to all sectors of society is one of the most pressing and difficult challenge facing cities across Southeast Asia. Water supply is an expensive proposition in low-income countries and often tradeoffs have to be made among such attributes as purity, reliability of delivery, private vs. shared connections and so on. Information about what attributes are most important to consumers and how much they can afford to pay for them, is thus very valuable to decision makers. Because of this, the results of a new study from Ho Chi Minh City, Vietnam, are particularly interesting. →

A summary of EEPSEA Research Report 2005-RR3, *Household Demand for Improved Water Services in Ho Chi Minh City : A Comparison of Contingent Valuation and Choice Modeling Estimates* by Pham Khanh Nam and Tran Vo Hung Son, Environmental Economics Unit, University of Economics-HCMC, 1A Hoang Dieu Street, Phu Nhuan District, Ho Chi Minh City, Vietnam. (Contact : khanhnam@ueh.edu.vn)

"Respondents expressed a clear preference...

Not only do they show how much the people in the city value a high-quality piped water connection, but they also throw new light on two different methods of assessing and quantifying this demand.

The research was carried out by Pham Khanh Nam and Tran Vo Hung Son from the Environmental Economics Unit at the University of Economics, Ho Chi Minh City. It looked at the water supply problems faced by more than 1,800 households across the city. The project was initiated because, while there is no critical shortage of water in the area, the existing piped water capacity can only meet around 70 per cent of overall water demand. Most of the existing water pipelines are old and deteriorating and a combination of ineffective management and inadequate budgets has meant that the city has been unable to provide the entire population with clean and safe water. As a result, in certain areas of the city, many households have to rely on alternative, often costly, sources of water, such as private wells and tanker trucks.

Getting to the Root of the Problem

These challenges are duplicated in cities across the country. At the root of many of these problems is the fact that, when it comes to implementing water supply projects in Vietnam, engineering solutions are often prioritized over the real needs of consumers. Many domestic water projects have been approved quickly, but have been based on a poor understanding of household water needs and people's capacity to afford new water services. This has resulted in some ill-conceived projects that have been costly and frustrating failures. The final result is that, all too often, people's demands for reliable water services have not been met

Nam and Son's study aimed to contribute to a demand-oriented water supply planning approach-one that requires water utility bodies' need to understand households' actual water use and their willingness to pay (WTP) for improved water services.

A Two-Pronged Research Approach

To get the information they needed, the researchers used two different methods to assess household water supply priorities. They also gathered information on the socio-economic profile of households, on their water use behaviour and on the ways in which they coped with inadequate water supplies.

The first approach was the Contingent Valuation (CV) Method. Representatives from households

Estimates of household willingness to pay (thousand VND/month)

Scenario	Description	WTP
Current situation	Water quality of private wells is not good, need to boil and filter before drinking. Water pressure from in-house tanks is low.	-
Scenario 1	Good water quality, boil before drinking. Moderate water pressure.	83
Scenario 2	Good water quality, boil before drinking. Strong water pressure.	122
Scenario 3	Excellent water quality, drink directly from tap. Moderate water pressure.	137
Scenario 4	Excellent water quality, drink directly from tap. Strong water pressure.	175

for improvements in water quality."

(both with and without piped water supplies) were asked whether they would be willing to pay a certain monthly amount for a piped supply that would meet all their water needs. Using a range of values derived from focus groups discussions and pre-test surveys, this amount was varied systematically between households to give a wide range of possible "bids" and a full range of the maximum amount different households were willing to pay. For households without a piped supply, the one-off cost of connecting to a supply was amortized into the monthly water payments.

	Connection	Status quo
Water quality	 (Drink straight from tap - high quality)	 (Boil and filter before drinking - low quality)
Water pressure	 (Strong pressure)	 (Low pressure)
Total household monthly water bill	140,000 VND	40,000 VND
CHOOSE ONLY ONE =>	☐	☐

An example of a choice set

The second approach used was Choice Modeling (CM). This was used only for a cross-section of those households without piped water connections. These households were interviewed because it was considered that they stood to benefit most from service improvements. These 'CM' households were presented with a number of water supply options. Each option specified a different level of service standard defined by water pressure, quality and cost.

The Cost of Coping

As expected, many of the households surveyed already put a lot of effort into coping with the gaps left by the unreliable, poor-quality public water supply. Many households used electric pumps to extract water from private wells and to fill storage tanks on the roofs of houses. Drinking water was often filtered and boiled.

The total monthly water costs of households with piped water consist of monthly water bills plus coping costs. Average coping costs for these households were estimated at VND 25,000, while average monthly water bills were VND 83,800 - a total of VND 108,800. The total monthly water costs of households with no piped water consisted only of coping costs which were, on average, VND 75,000.

To Pay or Not to Pay?

The social and economic status of each household affected were asked whether they would be interested in paying for improved water supply. For example, households that already enjoyed piped water, and families with larger total incomes were more likely to say "yes" to such charges. Not surprisingly, this willingness decreased when current water pressure was thought to be good or normal. It also decreased as the number of children in the household increased. This was thought to be because respondents made a 'trade-off' between the monthly water bill and the costs associated with raising children.

In 'non-piped' water households, the probability of a "yes" response decreased as water availability rose. For example, households with reliable private wells were not keen to pay for a piped supply. The probability of a "yes" reply increased as total household income rose and if the household owned a refrigerator. Ownership of a fridge was taken as an indication that the household could

afford a one-time connection fee. Not surprisingly, given the cost of bottled water, the probability of a "yes" was higher for households using bottled water.

How Much is Water Worth?

The average WTP for improved water supplies, from the CV method, was found to be VND 148,000 and VND 154,000 for 'piped' and 'non-piped' households respectively. Using the CM approach, the average WTP (for 'non-piped' households) was found to be VND 175,000.

The CM method gave some other important information. It showed that non-piped households placed more importance on water quality than on water pressure. For example, in one of the models investigated, willingness to pay for excellent water quality was VND 94,000, while willingness to pay for strong pressure was only VND 57,000.

Although the CM estimate was a bit higher than the CV estimate, statistically the difference between the two is not significant. This suggests that either method can be used to help develop water supply options.

To put these figures in perspective, the median WTP of 'piped' household was 35% higher than average monthly water costs. For 'non-piped' households, the median WTP was double average monthly water costs. Moreover, 'piped' households were willing to pay 3.5% of their monthly income for improved water service, while 'non-piped' households were willing to pay between 4.1% to 4.6%.

How to Improve the Plumbing

The results of this study suggest that people in Ho Chi Minh City are willing to pay a significant sum for improvements in the quality of their water supply. This puts the onus on policy makers to deliver the practical improvements that will make this possible. The study also provides comprehensive information about people's water supply priorities and their willingness to pay for different levels of service, information invaluable for the design of new water service projects.

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