

# Empirical Evidence on Users' perceptions and Opinions regarding Willingness to Pay for Water, Bundled Bill for Utility Services and Un-Metered Water Tariff Based on Income-Expenditure Pattern of User

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## ABSTRACT

*This study examined the water users' perceptions and opinions on willingness to pay for improved water services and adequacy of water tariff structure. An online questionnaire survey was administered electronically the participants were asked questions regarding their socio-economic status, ratings of existing water supply services, opinion on common/bundled bill for various utility services and opinion on water tariff structure based on income and expenditure pattern of the user. Total 360 respondents took-up the survey. 79.7 percent of people would have paid more given that their services were improved. 50.4 percent of the respondents agreed to the author's opinion that if instead of separate bills for essential services like electricity, gas, telephone, and water, which are all provided by government agencies there should be a bundled bill / common bill for all these services. However, 31 percent of respondents were against the idea. The results showed that only 19.5 percent of people felt that they should be charged based on their income and expenditure pattern. The water users strongly believed that water should not be free. However, most respondents felt that good governance of water was imperative and all ULBs should work hard to improve their service quality.*

**Keywords:** Income-Expenditure Pattern of User, Utility services, Water Tariff, Willingness to Pay,

## 1. INTRODUCTION:

In cities of Gujarat, urban water and sanitation services are being provided by Municipal Corporations (MCs) or Mahanagar Palikas (MPs) or Nagar Palikas (NPs). Despite the potential, the Indian municipalities are the weakest in the world in terms of access to resources, financial autonomy and revenue-raising capacity (Ahluwalia, 2014). With the ever-increasing urbanization, the urban management and its governance are significant evermore because the capability of a nation to pursue its economic goals is contingent upon its ability to manipulate the cities. Urban infrastructure services are profoundly supply-constrained, as is well known, mainly owing to severe deficiency of resources available to finance them. Indian municipalities are undercapitalized and their high energy costs are neither feasible nor sustainable (Ray, 2018). Numerous research study relating to Municipal Authorities points out the inadequacy of finance as the chief reason for poor administration of the respective local government.

One of the prime reason for poor financial performance of municipal bodies are its meager revenue/ tax recoveries mainly due to below par prices of services and incapacity to recover owing to policies that are driven by factors such as political, administrative and alike; further, the dependency of municipal body on state government for grants and funds also does no good in compelling the local body to improve upon its performance. National Water Policy, 2012 recognizes that "Pricing of water should guarantee its efficient use and reward conservation. Equitable access to water for all and its fair pricing, for drinking and other uses such as sanitation, agricultural and industrial, should be attained through independent statutory Water Regulatory Authority, set up by each State, after wide-ranging consultation with all stakeholders". Water pricing policies have a large and still relatively untapped potential to foster more efficient management of water resources in scarcity situations (Lopez-Nicolas et al, 2018). The main sources of revenue for water utilities are water taxes that are based on property values and water user charges that are based on volumetric consumption (Singh et al., 2005).

Since the water is a state subject, the methods of charging water also vary across states. Moreover, the lack of data on effective water demand and its sensitivity to a price change is a key obstacle in formulating appropriate water pricing policy for the state and the country. Though the ULBs &/or state government revises water tariff, the timing of such revision is more decided by the political notion and vote

bank politics of the respective state rather than the financial status of the ULBs. Moreover, the water rates are mostly very meager and are not revised on yearly basis to suit the changing inflation levels.

A closer look at the revenue recovery in the form of water tax/ water charges/water cess and its outstanding debt position of the respective local self -government bodies suggest that meager water tariff is one of the principal reason for the poor financial status of various municipal authorities.

India, in recent years, has indeed been a country of widening economic inequality (Subramanian and Jayaraj, 2015). The inadequate water charges do not fit in the present scenario. Over the past decades due to technological advancement, there is a remarkable improvement in the quality of life of people. The capacity of an individual to incur expenditure on various luxurious items have increased manifold. Moreover, what once was a luxury is now a necessity, viz. mobile phones, televisions, vehicles and alike items. Today, people are willing to pay more provided the services they use are worthy of it. Given the poor water recovery patterns of municipal authorities, it is only reasonable that the water pricing is evaluated in terms of 'Willingness to Pay' (WTP) and the income distribution and pattern of expenditure of water users.

## 2. METHODOLOGY:

An online questionnaire survey was floated by Google Forms and the same was also electronically mailed/shared to about 1200 individuals for eliciting their preferences and willingness to pay for water services like electricity, gas and telephone bills. The responses received from the survey were statistically analyzed to draw inferences.

Probability sampling was adopted for ascertaining the size of the sample to be used for the survey. The survey was designed to estimates many socio-economic parameters, but since the key indicator/parameter was income, the size of the sample was determined as suggested by the United Nations (2008) (Eq.I).

$$nh = (Z^2) (r) (1-r) (f) (k) / (p) (\bar{n}) (e^2) \dots\dots\dots (I)$$

Where,

nh = Sample Size,

Z = a statics that defines the level of confidence desired, for 95 % confidence level it is 1.96, 95 % confidence level is generally regarded as the standard for assigning the degree of confidence desired in assessing the margin of error in household surveys,

r = is an estimate of earning population to be measured by the survey, this is calculated as percentage of population residing in urban areas minus the rate of unemployment in these areas, as per Census records (2011) 42.6 % of people reside in urban areas and the rate of unemployment is 1 %, therefore, r = 0.416

f = the sample size design effect, a default value of 2 unless there is supporting empirical data from previous or related surveys that suggest a different value.

k = the non-response multiplier, the value of which should be chosen to reflect the country's own experience with non-response — usually under 10 percent in developing countries like India. A value of 1.1 would thus be a conservative choice,

p = urban population of the state, as per the latest census (2011) the rate of the urban dweller in the state of Gujarat is 42.6 %, therefore p = 0.426,

$\bar{n}$  = the average household size (number of persons per household), the Census records (2011) suggests that the average household size is 4.9 and for urban areas, this is slightly lower at 4.7. However, taking a conservative approach a value of 4.9 is adopted,

e = the margin of error, e, it is recommended that the level of precision be set at 10 percent of r; thus e = 0.10r.

Substituting these values into the Eq. (VIII) reduces to:

$$nh = 103.45 (1-r) / (p) \dots\dots\dots (II)$$

Substituting the value of r and p in Eq. (II) the sample size required for eliciting the WTP is 340.92. However, since a fraction of the sample is not possible the required size is 341.

The responses were obtained through a shared google form to primarily elicit the WTP and additionally the responses regarding water bill if charged on income and expenditure pattern and if in the absence of volumetric measurement of the supply indirect charging based on electricity, gas and telephone usage of the consumers.

## 3. RESULTS AND DISCUSSION:

The online survey was taken-up by 360 respondents. The female respondents were only 14 percent. However, 45 percent of the respondents were postgraduate, and 29.7 percent were graduate. 3.9 percent

respondents were those who only studied up to 12<sup>th</sup> Std., whereas 8.1 percent respondents were having matriculation. 8.3 percent of the respondents were having a doctorate degree.

Since the survey was conducted online a large share of the respondents were very highly educated. This could have introduced a certain degree of bias in the results, nevertheless as the online survey does not have the interviewer to narrate the objectives and prompt them to take up such survey, only those respondents who are more informed and consider such questionnaire to be directly addressing their concerns would only take up an online survey. This would bring in the required perspective in the results and would many times outweigh the bias.

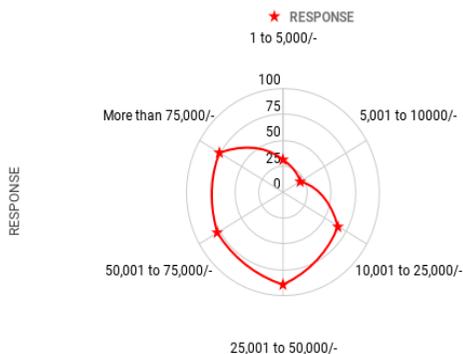


Figure 1 Monthly Income of Respondents

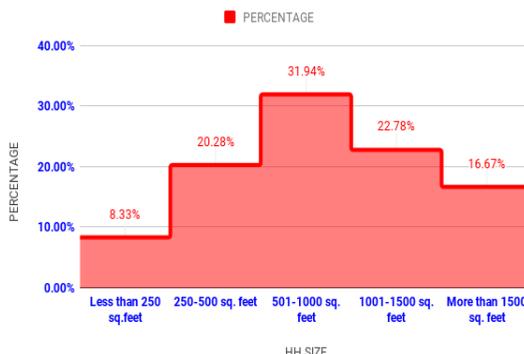


Figure 2 Size of Houses of Respondents

64.7 percent of respondents were service class people and only 15.6 percent of respondents were doing business. Here too, since the questionnaire was directly asking an individual’s income the business class people did choose not to take up the survey. As compared to service class people the business class people does not tend to disclose their true income. Maybe due to the fear of tax department and government bodies. This is typical of Gujarati mindset.

The monthly income of the respondents is shown in Figure 1. Out of 360, only 31 respondents were having a monthly income less than Rs. 5,000/-. Whereas, 76 respondents were having a monthly income in excess of Rs. 75,000/-. Only 14.2 percent of respondents were having a monthly income up to Rs. 10,000/-.

The average household size of Gujarat state is 4.7 and the national average is 4.9. However, the average HH size for the sample is 4.2 (i.e. slightly below national and state average). The results suggest that 31.9 percent of respondents were having HH size of 4 and were residing in 500 – 1000 Sq. Ft. house. Further, 16.1 percent of people who were having the HH size more than 5 were also residing in a house has more than 1500 Sq. Ft. This suggests that a higher HH size suggest a bigger house which in turn would also imply a higher water demand for the respective household. The HH size and the size of the residence is presented in Figure 2 and Figure 3.

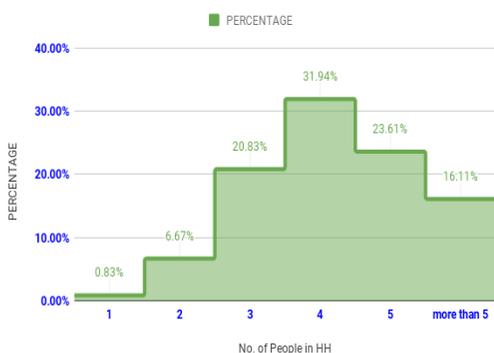


Figure 3 Household Size

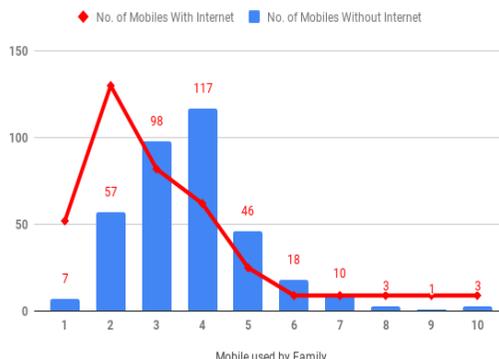
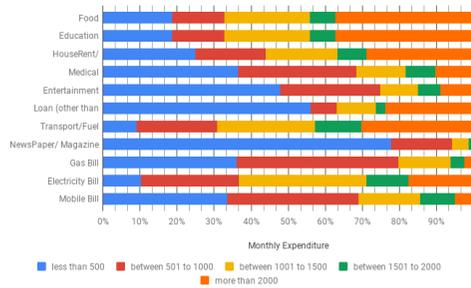
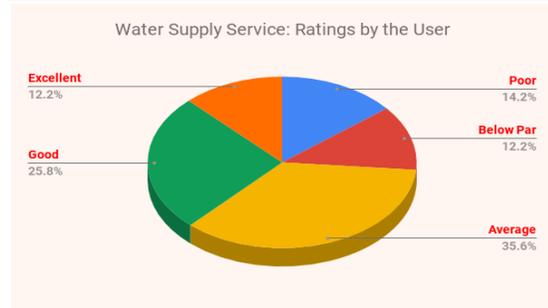


Figure 4 Mobile Facilities held by Respondents



**Figure 5 Respondents' Expenditure on Household Items**



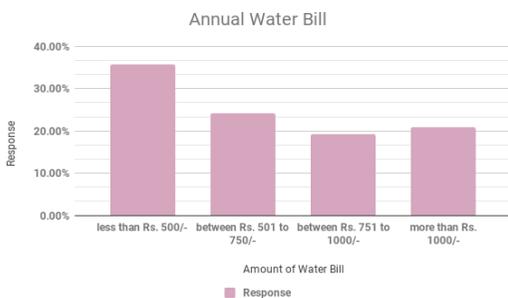
**Figure 6 Water Service Quality: User's Perception**

The responses show that 79.7 percent of respondents were having a television set, 72.2 percent houses had a washing machine, 91.9 percent of houses had a freeze, 33.1 percent of houses were equipped with air-conditioners, 33.6 percent HH have water heaters, and 55.8 percent household did possess a computer/ laptop.

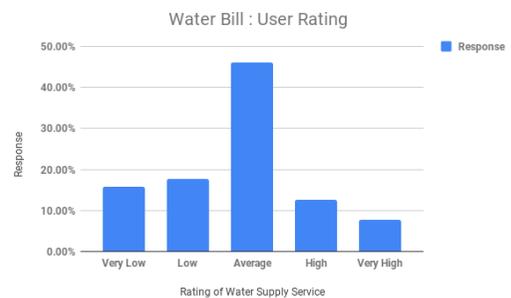
35 percent of respondents were possessing at least one two-wheeler, whereas 45.8 percent of respondents had at least 2 two-wheelers at their disposal. Moreover, 51.9 percent of respondents also possessed at least one car and 10 percent of respondents were having more than 2 cars.

Figure 4 shows the details regarding mobile phones and the internet of the respondents. The monthly expenditure on various items is presented in Figure 5. From the results, it can be observed that the socio-economic condition of most of the respondents was in higher-middle to a higher category. Figure 6 shows the responses on the water supply services offered by the respective ULB. It can be observed that 26.4 percent of respondents had rated the services as below par. Whereas, 38 percent of respondents had rated the services as good to excellent.

The response to a question on the annual water bill is presented in Figure 7. The survey results show that only 40 percent of people were annually paying in excess of the Rs. 750/- as their water bill. The National Sample Service Organization (NSSO) survey 2011-2012 data suggests that in Gujarat in rural areas, household electricity consumption was 10.7 units per capita per month, while in the urban areas it was 23.6 units per capita per month. The electricity tariff for rural area is Rs. 2.50/- per unit and Rs. 3.50/- for an urban area. Moreover, as per the NSSO 68<sup>th</sup> Round results of National sample survey on 'Household Consumption of Various Goods and Services in India', in Gujarat the average cost of gas for cooking was Rs. 23.20/- per person per month and the telephone/ mobile charges were Rs. 67.73/- per person per month. Thus a monthly water bill of Rs. 62.50/- (for entire HH and not per head) when compared to normal monthly electricity bill, gas bill, and mobile/ internet bill is very meager.

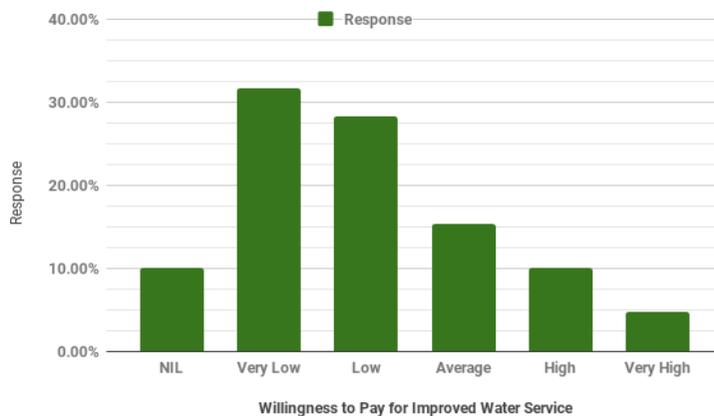


**Figure7 Annual Water Bill of Respondents**



**Figure 8 Adequacy of Water Bill: User's Perception**

Figure 8 shows the user's perception about the adequacy of their water bill. 33.6 percent of respondents felt that they were paying low for their water. Whereas, only 20.3 percent people believed that they were paying heftily for their water. This implies that 79.7 percent of people would have paid more given that their services were improved (i.e. the implied WTP).



**Figure 9 Respondent’s Willingness to Pay**

The fact that 55.8 percent of people were using filtered/bottled water this was suggestive of the fact that the respondents were not satisfied with the quality of water that is delivered to their doorstep by the ULB.

Figure 9 shows the result of a question directly asking an individual’s WTP. 50.4 percent of the respondents agreed to the author’s opinion that if instead of separate bills for essential services like electricity, gas, telephone, and water, which are all provided by government agencies there should be a bundled bill / common bill for all these services. However, 31 percent of respondents were against the idea.

Certain regions in England and Wales are using the single bundled bill to charge various utilities like electricity, gas, and water. The common single bill can be highly helpful in recovering user charges of all the services. As sometimes people tend to regularly pay their bill for services like electricity, gas, and telephone because they are quite certain that if they do not pay bills to these services in time their connections would be disconnected at once by the respective authority. This is not the case with the water because the user is quite confident that the respective ULB would continue to supply water under the notion of water being a ‘social good’ and essential to life, despite no or late payments. This allows the water user to take water bill less seriously as compared to other bills and this leads to poor revenue recovery by the ULB.

The results indicated that 28.4 percent of water users were not willing to have a volumetric measurement of their use and another 16 percent of them were complacent of having a metered water bill. 36.38 percent of respondents were willing to pay for unmetered water connection based on electricity usage, whereas only 20.27 percent of respondents were fine if unmetered water usage was calculated indirectly from gas usage. Only 25.55 percent of respondents agreed to indirect measurement of water usage from their mobile/telephone bill. Firstly because, very seldom a telephone / mobile user gets to see how a data measurement is done by the service provider and secondly, the electricity &/or gas usage by-and-large tend to remain constant for respective HH whereas, the mobile / telephone usage has been increasingly higher given the alluring offers from the service providers.

The results revealed that only 19.5 percent of people felt that they should be charged based on their income and expenditure pattern as against the government’s view. Though there could be an addition of 11.9 percent of people to this 19.5 percent who responded yes. Only 31.4 percent of people at the maximum can be believed to be in agreement with the idea of water tariff depending on socio-economic factors.

The results also showed that only 41.11 percent respondents offered their comments/suggestions. Of all the comments received only 11 percent of them felt that water should be free. Whereas, 82 percent of such respondents felt that good governance was imperative and all ULBs should look to improve its services. Also, 6 percent of respondents who offered comments felt that water should not be free even for poor as free water promotes wastage and brings down the value of this precious natural resources.

**4. CONCLUSIONS:**

The results suggest that socio-economic status of respondents was in higher-middle to a higher category. The users were forced to use filtered/bottled water due to the poor quality of water supply. 79.7 percent of the respondents showed a willingness to pay a higher amount for improved water supply services. The idea of a common/bundled bill for essential services like electricity, gas, telephone, and water could be accepted by the public. However, water tariff structure based on the income-expenditure pattern of the user may not be accepted by the users. The water users strongly believed that water should not be free. However, most

respondents felt that good governance of water was imperative and all ULBs should work hard to improve their service quality.

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