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DETERMINING FACTORS OF HOUSEHOLD WILLINGNESS TO PAY FOR DRINKING WATER SERVICES

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ABSTRACT
Determinants of Willingness to Pay (WTP) for drinking water facilities help a lot in identifying price concerns and appropriate strategies for the facilities of drinking water to the households. The current study investigates the key determining factors of WTP for drinking water services and presents a logical setup that explains the significance of WTP determinants. We applied Contingent Valuation Approach (CVA) and analyzed the results through multinomial logistic regression. Findings disclosed that the income, education of the household head, highest education in the family, family size and residential area of the household significantly influence the WTP. It is suggested that education and awareness about water quality have to be disseminated among the households to increase their WTP for the drinking water services. The government should boost the income-generating programs to improve the financial status of the households to enhance their willingness to pay and purchasing power.
Keywords: Drinking water, Contingent Valuation Approach (CVA), Determinants, Household, Willingness to Pay (WTP), Policy.

INTRODUCTION
The provision of drinking water services is one of the major concerns all over the world. Water quality has been affected badly due to rapid industrialization, high population growth and excessive usage of chemicals in the agriculture sector. Many industries dump their waste in the environment without any treatment, as a result, freshwater resources turn out to be polluted (Malik and Khan, 2016). Contamination in drinking water has been the main reason for waterborne diseases like diarrhoea, typhoid, dysentery, gastroenteritis and many other health issues (PCRWR, 2005). Approximately, 768 million people in the world lack the facility of good quality drinking water and 185 million people are dependent on surface water for drinking purposes (WHO, 2015). It has been estimated that over three million people are suffering from waterborne diseases in Pakistan and millions of them are losing lives each year (Kahlown et al., 2006).

Rising health issues make the availability of clean drinking water a burning issue. Water supply according to health standards and the public requirement is a challenging task at present times. Household choices and their willingness to pay for better drinking water supply can be helpful to ascertain the prefered level of amenities and arrangements, using appropriate strategies to supply safe drinking water (Gadgil, 1998; Vasquez et al., 2009). Environmental changes and health concerns had altered the consumer attitude regarding drinking water quality and its services. Public education and perceptions regarding clean drinking water play an important role in drinking water source selection of the households and the prevention measures of water contamination (Wright et al., 2012; Zafar et al., 2020). When households encountered poor quality tap water, they usually move toward the alternative source as filtration of water, spending on water setups privately or use of bottled water (Potera, 2002).

Awareness about water quality significantly influences the water source choice, purification method as well as WTP for the quality water (Jalan et al. 2009).

WTP is the maximum sum of money for which households are ready to give up to acquire certain goods or services (Mbachu et al., 2018; Javan-Noughabi et al., 2017). WTP of the household clean drinking water services can be checked by using two approaches, the direct approach and the indirect approach (Abdallah et al., 1992). The direct approach of WTP incorporate the stated preferences and ask the individuals directly, how much money they are willing to pay for the better quality water services, which is termed as a Contingent Valuation Approach (CVA). The CVA is applied to estimate the monetary value of the environmental goods by using the survey to check out the individual preferences regarding such goods (Haq et al., 2010). Whereas, the indirect approach is also known as the revealed preference approach based upon the data about observed behaviour of water use and averting behaviour regarding unsafe water quality to estimate the WTP. To avoid unpleasant effects and circumstances of water contamination users develop many strategies to cope with the issue. The coping cost provides an estimate of people's WTP for a better-quality water facility. Valid estimates of WTP can help to make optimal pricing policies and response forecasting regarding the water provision services.

The current study is aimed to explore the major determining factors that affect the WTP of households for clean drinking water service. Additionally, the study also provides some policy implications based on the findings. The uniqueness of this study is that it is a rigorous attempt to find out the major determinants of WTP for clean drinking water facilities and incorporate the comparative analysis of WTP between urban and rural households. In addition, the study designed a logical set-up to describe the socio-economic importance of determinants of WTP. Furthermore, the study can help out policymakers and social scientists to find the factors that may help in determining the pricing mechanism of drinking water. The study is expected to contribute to strategic planning and public policy debates regarding the clean water supply projects in developing economies like Pakistan.

REVIEW OF LITERATURE AND CONCEPTUAL CONTEXT

Willingness to Pay (WTP) for clean drinking water is a good way to monetize the need and value of water. The Contingent Valuation Approach (CVA) has been a versatile and powerful tool to measure the economic benefits for the provision of wide-ranging environmental studies (Mitchell and Carson, 2013; Makwinja et al., 2019). Bilgic (2010) analyzed the WTP for the better water facility in Anatolia, Turkey. The key objective of their research was to examine the significance of better quality water for households to mitigate the water-born contaminants. Findings revealed that bid price, education of household head, gender, residential status, food expenditures, number of working persons in family and perception indices significantly influence the WTP for the improved quality tap water. Haq et al. (2010) examined WTP of the households for clean drinking water in district Abbottabad, Pakistan. They found that in Abbottabad existing drinking water system was not reliable to meet the household requirements in terms of quality and service. They concluded that the perceptions of household about the opportunity cost of consuming unsafe drinking water were highly affected by the perception of households.

Ahmad et al. (2014) examined the factors that can affect the WTP and demand for clean drinking water supply in district Peshawar, Pakistan. They concluded that formal education has a substantial effect on willingness to pay and demand for clean water supply services. However, media have a strong effect on household behaviour regarding water purification. Khan et al. (2014) examined the WTP for the drinking water and estimated the benefits of a safe drinking water supply in Bangladesh. They found that residential area, the income of a household, water source, awareness about contamination of water and safe supply service were the key factors that affect the WTP. Mezgebo and Ewnetu (2015) examined the willingness to pay of the households for good quality water service in urban localities of Ethiopia. They found that income, water expenditure, education, marital status, sex and consummation with prevailing water amenities were associated with the WTP of the households.

Tussupova et al. (2015) examined the WTP for good quality service of water supply through applying the contingent valuation approach. They found different perceptions of the households about water quality, as groundwater users perceived water quality as good, whereas, open-source water users perceived that water quality was poor. They identify that 90 % of the consumer were ready to pay for clean and reliable water facilities. Jianjun et al. (2016) evaluate the WTP for improved quality drinking water in Songzi, China. They found that the average WTP of households for good quality drinking water

was 16.71 yuan and was about 0.3% of the family income. They concluded that perceptions about health risk due to unclean drinking water had a positive influence on the public WTP.

Makwinja et al. (2019) explored the determinants of WTP for good quality water service as well as the influencing factors by applying CVM. They found that 57.4% of the public responds that they are ready to pay for the clean water facilities. However, the monthly aggregate amount of an individual's WTP was ranged from 0.95 US$ to 111.38 US$, and the average WTP was 10.73 US$. Hayat et al. (2020) investigated sustainable urban planning and household WTP for the water provision in urban Peshawar. They found that many people were not contented with their drinking water quality. Moreover, the household education, income and employment status had a positive effect on WTP for the supply of drinking water.

Logical setup: Why needs to identify the determinants of WTP for Clean Drinking Water Services (CDWS)?

Willingness to Pay (WTP) for Clean Drinking Water Services (CDWS) is the amount of money that people are ready to spend for good quality water services. Socio-economic factors, WTP for water services, water prices and provision of drinking water services are highly influenced by each other. Figure 1 showed the logic behind the importance of WTP determinants. The figure illustrates that different socio-economic factors determine and influenced the WTP of households for CDWS as well as the quality of service supply, simultaneously. Whereas, WTP perform a crucial role in price determination and quality of water supplying service. Identification of WTP determining factors helps the service providers and policymakers in price setting and policymaking. Similarly, service quality also gets affected by pricing setups, as service providers get more revenues they will have more funds to improve the service and network expansion. Thus, for the planning and management of water supply setups, it is essential to identify the key determinants that influence the WTP of households.

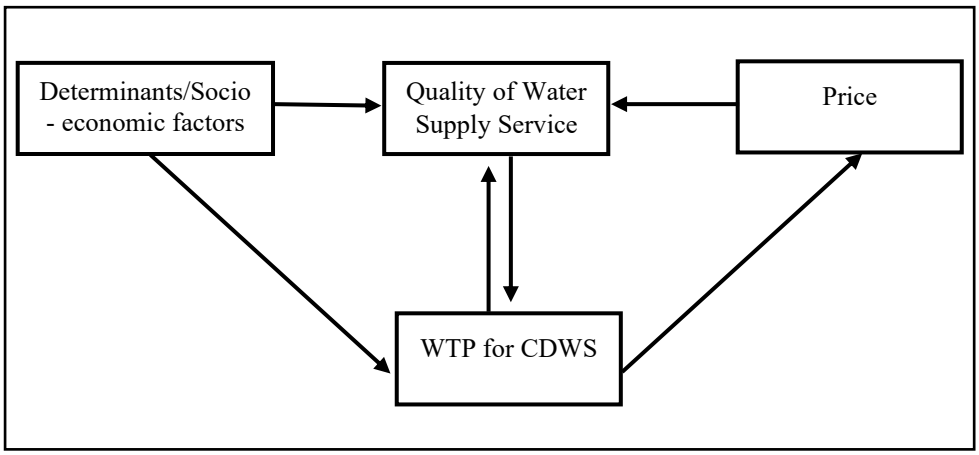

Figure 1: Importance of determinants: Logical setup

Source: Designed by the author

This study tests the following research hypothesis

H1: Residential locality of households significantly determines the WTP

H2: There is positive impact of household's income on WTP for CDWS

H3: Family size negatively affect the WTP of the households

H4: There is positive impact of education level on the WTP of the households

METHODOLOGY

Study area and sampling procedure

The region selected for sampling were the localities of district Faisalabad (31°25'0" N and 73°5'28" E), Punjab, Pakistan. The area of the Faisalabad district is 5856 Km^2 with a population of 7.87 million and the number of households 1.23 million according to the 6^{th} population census. Faisalabad district has eight autonomous towns, namely; Iqbal town, Jinnah town, Lyallpur town and Madina town (the central zones of the district), Samundri town, Chak-Jhummra town, Jaranwala town and Tandlianwala town (adjacent localities of the central city). Faisalabad turns out to be a major industrial zone and distribution centre due to its central location and economic importance in the region. But with hasty industrialization and rapid population growth, Faisalabad is suffering from the scarcity issues of clean drinking water

facilities. Keeping in view the rising demand and public concerns for clean drinking water present study choose the households of Faisalabad as the targeted population.

The current study used the primary data and applied the stratified sampling approach for the sample selection and distributed the households in urban and rural strata's. To determine the proper sample size, the following formula was used as shown in equation (1).

$n = (N * X)/((X + N - 1))$ *(1)*

Where,

$X = Z_{\alpha^2/2} * (P * (1 - P)/MoE^2$ *(2)*

Whereas '$Z^{\alpha}/_{2}$ is the critical number of standard normal distribution at '*α/2'*, (while, 'α' is the confidence interval that was selected at 5%, and the critical number was 1.96), 'MoE' is the error margin, 'p' is the sample proportion and 'N' represents the size of the population. Nonetheless, by selecting a confidence level of 0.05 and an error margin of 4%, the sample size (n=600) households.

The subdivision (n=600) was based on stratified sampling by dividing the population into urban and rural localities. Stratification was done by implying proportionate sampling (n=50%) from rural and (n=50%) from urban areas. Furthermore, in rural, four subdivisions were identified, namely, Jaranwala, Jhummra, Summundri and Taindianwala town. From each town, (UCs/town, n=5) were randomly identified then from each Union Council (UC) one village was selected (Village/ UC, n=1) and (household/ village, n=15), overall household from each town (n=75), total households from rural localities (75*4; n=300). Similarly, Jinnah town, Layallpur town, Madina town and Iqbal town were identified from urban strata and the same procedures were applied in urban localities as for rural areas.

Data collection and analysis

To acquire information from households' regarding their socioeconomic characteristics and the willingness to pay for better quality drinking water facilities a structured questionnaire was prepared. To check out the validity and correctness of the questionnaire, a pretesting survey was performed in different localities of the probe area. As a result of pretesting slight modifications were made and after finalizing the questionnaire, the data collection procedure was performed. Before filling out the questionnaire, proper guidelines were provided to the respondents regarding the questionnaire and request them to fill the form. Afterwards, raw data were coded and systematized for further analysis.

This study investigates the WTP of households in two steps. First, the respondents were enquired, whether are they willing to pay money for a good quality water facility or not. In the second step, a contingent valuation approach was used and asked the household about different pricing options (their preferences) for drinking water facilities and other socioeconomic aspects to explore determinants of WTP. The Contingent Valuation Approach (CVA) is a method that is used to estimate the monetary value of goods through the survey questionnaire to investigate the preference of individuals (Haq et al., 2010). People have different preferences over the variety of goods, these preferences can be marketed or non-marketed. Consumers always want to maximize their utility within their budget constraints. Let's consider a household that wants to maximize his/her utility by acquiring a good quality water facility, utility function of the household is assumed as;

$U = f(W, Z)$ *(3)*

Where;

W= good quality water acquired by household

Z = composite of the all other commodities

The expenditure function (E) of the household is given in equation (4), which measures the minimum sum of income the household need to consume to attain a certain level of utility.

$E = f(P, W, U)$ *(4)*

The outlay function is the increasing function of prices (P) and utility (U) and a decreasing function of water quality (W). Meanwhile, the consumer wishes to remain on the same level of utility, so it is suitable to apply the expenditures minimization problem.

Min (Z+PZ) is subject to U (W, Z), whereas the price of composite goods is equivalent to 1, as PZ=1. This minimization problems has to solve by applying the Lagrange multiplier to get the Hicksian demand function for the defined good.

The Hicksian demand function is given in equation (5) as;

$H_i = h_i(PW, U^*)$ *(5)*

The minimum expenditure function can be determined by putting the values of the given Hicksian demand function into the minimum expenditure function as;

$E = E(P, W, U^*)$ (6)

Where minimum expenditure(E^*) is required to attain the fixed utility level(U^*) and consumption of safe drinking water(W) are the functions of the price of other commodities (P), fixed utility level and clean drinking water consumption.

The derivative of the expenditure function respecting the price give the corresponding Hicksian compensated demand function for the good under consideration is given as;

$\partial E/\partial Pi = H_i\ (PW, U^*)$ (7)

WTP for the alternative water facilities is the incorporation of the marginal WTP to attain the quality water 'W' to 'W*'.

$WTP = -\int_{W}^{W*} \partial E(W, U*)/\partial W\ \times dW$ *(8)*

WTP is the maximum price that a consumer is ready to give up for a better-quality water facility. The WTP for the quality improvement is given as;

$WTP = E(P, W, U) - E(P, W*, U)$ *(9)*

Whereas, 'W' and 'W *' represents the degraded and better-quality water, respectively.

The spending difference is either a corresponding surplus or compensating surplus if the reference level utility is the personalizing utility, then it is said to be compensating surplus, on the other hand, if the reference utility is final, then it is stated as equivalent surplus. WTP be contingent upon many factors such as the income of a household, education level and family size etc. (Whittington et al., 1990; Altaf et al., 1992 and Bogale and Urgessa, 2012).

The current study applied multinomial logistic regression to investigate the determinants of WTP. It is a technique that generalizes multi-class problems, such as more than two discrete outcomes (Green 2012). It used the likelihoods for the n categories of the dependent variable Y by employing a set of explained variable X, as shown in equation (10).

$Pr\ (Y_{ik}) = Pr\ (Yi=k|x_i;\ \beta_1, \beta_2, \beta_3, \ldots\ \beta_n = \frac{exp\ (\beta_{0k} + X_i \beta k)}{\sum_{j=1}^{n} exp\ (\beta_{0j} + X_i \beta_j)}$ *(10)*

Where, K=1,2,3,….n and β_k is a row vector for the regression coefficients of X for the k^{th} category of Y. The other convenient way to explain the problem let assumes that $\beta_{01}=0$ and $\beta_1=0$, so that;

$P_r(Y_{i1}) = 1/1 + \sum_{j=2}^{n} exp\ (\beta_{0j} + x_i \beta_j)$ *(11)*

And

$P_r(Y_{i1}) = exp\ (\beta_{0k} + x_i \beta_k)/1 + \sum_{j=2}^{n} exp\ (\beta_{0j} + x_i \beta_j)$ *with k=2,3,…..n (12)*

The general form of a multinomial logistic model can be written in the following form;

$Pr(Yij) = \beta_{0k}\ +\ x_i\, \beta_k + \epsilon ij$ *(13)*

Where j represents the categories, xi is the set of regressers and and ϵij shows the residual.

This study used different categories for WTP of the household for the clean drinking water facility, that is, WTP up to 300, 301-600, 601-1000, 1001-1500 and 1500 or above. The following model was specified as;

$WTP = \beta_o + \beta_1 Income + \beta_2\ Family\ size + \beta_3\ Edu.\ of\ HH + \beta_4\ Highest\ edu. + \beta_5\ area$ *(14)*

Where,

WTP = Willingness to pay for clean drinking water supply (PKR/month)

βo = Constant

Income = Income of the household head (000 PKR/month)

Family Size = Number of members in the family (Numbers)

Edu. HH = Education of household head (Year of schooling)

Highest Edu. = Highest education in the family (Year of schooling)

Locality = Residential area of the respondent (urban, rural)

RESULTS AND DISCUSSION

There are three stages of analysis. In the first stage, descriptive analysis shows the household profile comprising their socio-economic characteristics. The second stage is a quantitative analysis that explores the WTP responses of the households and compared the outcomes regarding the residential area. At later stages, a contingent valuation approach and multinomial logistic regression have been applied to identify

the household preference regarding WTP and aspects that affect the WTP of the household for improved water services.

Table 1 reveals the key statistics of the major socio-economic indicators of the households, such as family size, locality, education of household head, highest education in the family and household income. Results disclosed that the average size of the family was 7.3 and ranges 3 to 14 persons, mean education years of household head and the highest year of schooling in the family were 10 and 14 and ranges around 0 to 18 and 5 to 18, respectively. However, it was found that the average income of the households stands at 53473 PKR/month, and ranges between 12000 to 122000 PKR/month.

Table1: Summary statistics of indicators used in WTP function

Variable	Mean	Min.	Max.	Standard Deviation
Locality (urban, rural)	0.5	0	1	0.02
Family size (Members)	7	3	14	2.0
Education of household head (Schooling Years)	10	0	18	3.9
Highest education in the family (Schooling Years)	14	5	18	2.3
Income (PKR per month)	53473.3	12000	122000	19881.6

Source: Author's calculations from field survey

Table 2 presented the responses of household about their willingness to pay for clean drinking water facilities. Outcomes disclosed that on an average 82.8% of the total household agreed to pay for good quality water service. However, the residential status of the households greatly influenced the WTP of the respondents, as in urban localities most of the households (87%) were ready to pay for drinking water services, whereas, in rural areas, they are less in number (78.6%). Findings indicate that the household belonging to urban regions was more curious about water issues than the rural regions.

Table 2: WTP Responses of households for clean water facilities

WTP responses	Area		Average percent (Total counts)
	Rural Percent (Counts)	Urban Percent (Counts)	
Yes	78.6 (236)	87.0 (261)	82.8(497)
No	21.4 (64)	13.0 (39)	17.2(103)
Total	100.0 (300)	100.0 (300)	100.0 (600)

Source: Author's calculation from field data

The statistics of the Contingent Valuation Approach (CVA) are summarized in Table 3. Findings showed that about 17.2% of the total households were in favour of free water service. Whereas, 32.5 % of the households were willing to pay between 601-1000 PKR (8.08-13.44 US$) per month. On the other side, a small proportion of households i.e. 3.8% and 6.8% were willing to pay 1001-1500 PKR (13.45-20.16 US $) and >1500 PKR (>20.16 $), respectively. Outcomes indicated that people who reside in urban localities were willing to pay more money than rural households, as, 6.3% of urban households were willing to pay 1001-1500 PKR (13.45-20.16$), as compared to 1.3% of rural households and merely 0.3% people in rural localities were willing to pay >1500 PKR (>20.16 $), compared to 13.3% of urban households.

Table 3: Households responses regarding different levels of willingness to pay for drinking water service

WTP for drinking water service/month	Residential area		Average percent (Total counts)
	Rural Percent (Counts)	Urban Percent (Counts)	
Free service	21.3 (64)	13.0 (39)	17.2 (103)
PKR≤ 300 (≤4.03 US $)	25.1 (75)	6.3 (19)	15.7 (94)
PKR 301-600 (4.05-8.06 US$)	30.7 (89)	18.7 (55)	24.0 (144)
PKR 601-1000 (8.08-13.44 US$)	22.3 (67)	42.7 (128)	32.5 (195)
PKR1001-1500 (13.45-20.16 US$)	1.3 (4)	6.3 (19)	3.8 (23)

PKR >1500 (>20.16 US$)	0.3 (1)	13.3 (40)	6.8 (41)
Total	100.0 (300)	100.0 (300)	100.0 (600)

Source: Authors calculation from field data

To find out the determinants of WTP, the multinomial logistic regression model was employed by taking demographic, social and economic variables. Willingness to pay of the households was taken as a dependent variable and was in categorical order (PKR/month). Whereas, some other factors like residential area (rural, urban), the income of household (PKR/month), years of schooling of household head, as well as, the maximum years of schooling in household and family size (number of family members) were taken as explanatory variables. Table 4 illustrates the results of willingness to pay categories compared with the reference category of free water services.

The first category was up to 300 PKR./month ((<4.03 US$/month) with the reference category of free improved water service, here income of households, year of schooling of household head, highest level of education in the household and locality were positively related with the willingness to pay for drinking water facility. The household income and number of schooling years of the household head were found to be highly significant. It showed that the high-income level and education of the household head enhanced the willingness to pay for better quality drinking water facilities. On the other hand, the family size was negatively related to the willingness to pay decision of households that explained the poor willingness to pay of households having large family sizes.

The second category of willingness to pay was for 301-600 PKR/month (4.05-8.06 US$). In this category, income, the number of schooling years of household heads, and the highest education level in the family were positively associated with the WTP of the household. Results showed that the household income had a significant impact on household WTP for water supply. It disclosed that the households with more income tend to consume more money for improved water facilities and vice versa. The findings also revealed that the schooling of household heads and family members significantly affects the willingness to pay, as more educated household heads strongly agree to pay for clean drinking water facilities as compared to less educated household heads. However, the negative sign with the coefficient of family size represents that as the number of family members increases it reduces the household's willingness to pay for water facilities. Nevertheless, the residential locality is negatively associated with the WTP of a household and revealed that rural households had a negative inclination to pay for water services.

The third category of WTP ranges between 601-1000 PKR/month (8.08-13.44 $). Results revealed that all the variables were highly significant except family size. The coefficients of family size and locality have negative signs showed that small families tend to pay more for water facilities and large families have less propensity to consume for drinking water service. The coefficient of the rural area also has negative signs that indicate the diminishing WTP of people who resides in rural localities. With reference category of free service fourth category is 1001-1500 PKR/month (13.45-20.16$). The coefficient of income is positive and highly significant which indicates that as the income of household heads increases their WTP for water service goes up. Moreover, the education of the household head is also highly significant and have a positive association with WTP for water facility. Outcomes in the category of WTP pay >1500 PKR./month (>20.16 $) showed similar results as explained in the fourth category, however, the values of coefficient get larger than before showed the strength of the response variable for willingness to pay of households. The Chi-square value (762.410) of the model is statistically significant and showed that the model is good fitted. The Cox and Snell R^2 and Nagelkerke R^2 values also revealed the fitness of the employed model. However, Nagelkerke R^2 indicate the greater fit of the model 0.749 and characterize the strong association among the variables.

Table 4: WTP determinants multinomial logistic regression results

WTP /month	Variables	B	Std. Error	Wald	Exp (B)
PKR≤300 (≤4.03 US $)	Intercept	-5.526***	1.252	19.482	
	Income	.000***	.000	21.728	1.000
	Family Size	-.077ns	.074	1.089	.926
	Edu. of HH head	.235**	.051	20.998	1.265
	Highest edu. level	.120ns	.074	2.582	1.127
	Rural areas	.826***	.373	4.902	2.284

	Urban areas	0[b]	.	.	.
PKR 301-600 (4.05-8.06 US$)	Intercept	-11.042***	1.507	53.722	
	Income	.001***	.000	77.904	1.000
	Family Size	-.112ns	.081	1.924	.894
	Edu. of HH head	.287***	.055	27.567	1.333
	Highest edu. level	.328***	.080	16.635	1.388
	Rural areas	-.397ns	.382	1.081	.672
	Urban areas	0[b]	.	.	.
PKR 601-1000 (8.08-13.44 US$)	Intercept	-18.282***	1.874	95.204	
	Income	.003***	.000	139.947	1.000
	Family Size	-.136ns	.096	1.984	.873
	Edu. of HH head	.563***	.068	68.905	1.756
	Highest edu. level	.321***	.093	11.841	1.379
	Rural areas	-2.036***	.442	21.204	.131
	Urban areas	0[b]	.	.	.
PKR1001-1500 (13.45-20.16 US$)	Intercept	-29.847***	3.004	98.705	
	Income	.005***	.000	143.493	1.000
	Family Size	-.023ns	.156	.022	.977
	Edu. of HH head	.726***	.110	43.817	2.067
	Highest edu. level	.412***	.157	6.851	1.510
	Rural areas	-3.335***	.762	19.137	.036
	Urban areas	0[b]	.	.	.
PKR >1500 (>20.16 $)	Intercept	-30.128***	2.940	105.018	
	Income	.008***	.000	170.732	1.000
	Family Size	-.298**	.154	3.728	.742
	Edu. of HH head	.694***	.103	45.720	2.002
	Highest edu. level	.517***	.148	12.124	1.667
	Rural areas	-5.139***	1.142	20.236	.006
	Urban areas	0[b]	.	.	.
-2 log likelihood					1146.128
Chi-square					762.410***
Cox and Snell R^2					0.719
Nagelkerke R^2					0.749

Source: Author's computations from survey data
***, **, * significant at 1%, 5% and 10 % respectively
'ns' not significant

DISCUSSION

The present study was designed to explore the factors that determine and affect the household WTP for better quality drinking water facilities. The descriptive examination was done to find out the ranges of the socio-economic features of households and the reliability of the data set. The quantitative analysis represents the dichotomous response results for the WTP of the households for better quality drinking water facilities. Results showed that the residential location of the household greatly affect the willingness to pay of the respondents, as the household's in urban localities were willing to pay more for the improved quality drinking water services. Haq et al., 2010, also found the significant effect of locality on household willingness to pay.

Willingness to pay preference change due to different socio-economic factors and household's characteristics and give valuable information about consumer's behaviour. Bilgic (2010) also reported that WTP for good quality water is influenced by the characteristics of the respondents'. Literacy level is one of the major factor which influences people choices and health protection behaviour. Results disclosed that the household heads who were more educated willing to pay more money for the drinking water services. These outcomes are similar to the findings of Wang et al., 2010; Wang et al., 2013 and Parveen et al., 2016.

Higher levels of schooling affect the household willingness to pay, however, along with education and awareness income level gives more support to the people that they spend money for a healthy and prosperous life. Bilgic, 2010 and Khan et al., 2010 also found that the educated household heads were strongly convinced to pay for clean drinking water facilities as compared to less educated household. On the other hand, it was found that the family size was negatively related to the willingness to pay decision of the household that explained the poor willingness to pay of households having large family size. These findings are in line with the results of Jianjun et al., 2016.

The income of households is also one of the major influencing factors which affect the WTP. Results showed that the household income had a significant impact on household WTP for drinking water services. However, it is positively associated and disclosed that the households with more income are more willing to pay for the water services and vice versa. Halkos and Matsiori, 2012; Khan et al., 2014 and Makwinja et al., 2019 also found a similar relationship between income and WTP. Tumay and Brouwe (2007) also argued that income and residence significantly affect the WTP of the households.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The willingness to pay of households for clean drinking water facilities is highly influenced due to different socioeconomic factors. Results of the study revealed that the income, level of education, residential area and family size of the household significantly determine the households' willingness to pay choices for better quality drinking water facilities. As per, the households who had more income were ready to pay more for clean drinking water facilities. However, the education of the household has a significant impact on WTP for good quality water. Furthermore, the prevalence of WTP for clean drinking water facilities was greater in urban households (87%) as compared to rural households (78%). It is recommended that education regarding water quality have to be disseminated among the household to enhance the willingness to pay for clean drinking water. However, the government should boost income-generating programs to improve the financial status and the purchasing power of the households. In future, we will attempt to explore the WTP following price setups that may have a wider impact on the economic policy and society.

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