© Kamla-Raj 2015 J Hum Ecol, 49(3): 231-243 (2015) PRINT: ISSN 0970-9274 ONLINE: ISSN 2456-6608 DOI: 10.31901/24566608.2015/49.03.07

# Willingness to Pay for Water Services in Two Communities of Mutale Local Municipality, South Africa: A Case Study

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KEYWORDS Willingness to Pay. Gender. Monthly Income. Family Size. Literacy Level

ABSTRACT The provision of reliable and adequate drinking water services in rural communities is important. Here, the researchers reported on a study that evaluated the respondents' willingness to pay for water services in the two communities in Mutale Local Municipality, South Africa. The study was accomplished through open-ended questionnaire interviews with selected respondents. The study showed that respondents were dissatisfied with the unreliable water services (89.9%) but were willing to pay for water services to secure reliable water services (95.5%). The respondents with tertiary level education were willing to pay R 150 per month per 6 kilolitres. The maximum 6 kilolitres is the free basic water services that the municipality can provide without collecting water revenues. The following variables: literacy levels; household size of 3 to 6 members; the age of 40; and monthly incomes, had a significant effect (p = 0.005) on the monetary amount and the willingness to pay.

#### INTRODUCTION

South Africa is classified as a water-stressed country, with an average annual rainfall of around 500 mm, which is less than 60 percent of the world average rainfall (DWAF 1994). This is made worse by rapid urbanisation that required more drinking water and increased water pollution and the non-functional of water supply systems in rural areas (Mackintosh and Colvin 2003; Kahinda et al. 2007; Oberholster et al. 2008). Though, South Africa has made considerable progress in ensuring that there is provision of safe drinking water services but water access challenges are being faced in rural areas (Rietveld et al. 2009). Many rural households do not have private water connections and, thus, are forced to queue to collect the drinking water from public taps, public boreholes, wells, springs and rivers (Mutale Local Municipality IDP 2007). However, there are some rural households that own private water taps that are connected to the municipal water distribution system and may share the water resource with neighbours, but they have running water only for a few hours per day, while others own private boreholes (Whittington and Boland 2002; Arouna and Dabbert 2012).

Mutale Local Municipality is faced with the big challenge of supplying water services to its ever increasing population just like any other municipality in South Africa. The municipality has 24,239 households and out of that number, only 6,573 households (27 %) have basic water supply service, while further 17,666 households receive the free basic water supply (Mutale Local Municipality WSDP 2007). The DWAF (2002) promulgated a minimum level of water supply of 25 litres per capita per day which the local authorities are expected to provide to their residents without the residents incurring any costs or paying for the water charges within 200 m from their homes. The free basic water supply is water supply that is subsidised by Mutale local municipality and any consumption above the free water 25 litres per capita per day attracted payment by the consumer (Mutale Local Municipality IDP 2007). The municipality has initiated developmental projects that are aimed at increasing the quantity of water (Mutale Local Municipality IDP 2007). The current water projects that the Mutale Local Municipality (MLM), has completed are the construction of a weir on Mutale River to augment the raw water quantity; has increased pipe capacity from 200 mm to 400 mm diameter to convey more water from the weir to the water treatment plant; has changed the water treatment plant from slow sand filtration to rapid sand filtration system with the capacity of 3.6 mega litres a day; and has constructed two additional water reservoirs with a combined capacity of 13 mega litres. The problem experienced at Mutale Local Municipality was that the residents were not paying for water

services. This may be compounded by high unemployment and a few income earners with a regular income. In 2006, a population of 6,553 was employed in the local economy and a further 8,070 were unemployed (Mutale Local Municipality IDP 2007). Furthermore, 12,494 of the population earned between R1 to R400 per month implying that the majority of the population (70%) had no income at all (Mutale Local Municipality IDP 2007). Thus the municipality cannot provide water services regularly unless the residents pay for such a service. However, the residents cannot avidly pay for water service if there are still unresolved problems such as travelling for long distance (greater than 200 m) to fetch water, incorrect meter reading and erratic water supply. The municipality was in the planning process of improving the water services, but are the people willing to pay for such services? Evaluation of the willingness to pay is of paramount importance in the planning and budgeting for community water services. The Water Supply and Sanitation Policy (DWAF 1994) stated that; "The user pays". This is a central principle to ensure sustainable and equitable development, as well as efficient and effective management of water services. Thus, the study sought to assist the Mutale Local Municipality in finding, the reasons why the residents were not willing to

pay for water services, suggested ways to persuade the residents to pay, and raising the community's awareness to the advantages of paying for water services. The study was designed with the following objectives:

- To evaluate the community's satisfaction with the current water supply services and the reasons.
- To determine the factors that influence residents' willingness to pay for water services.
- To determine the percentage of residents those were willing to pay for the improved water supply services out of the sampled population.

# METHODOLOGY

# Location of Study Area

Mutale local municipality is one of the four local municipalities, namely Musina, Makhado and Thulamela, comprising Vhembe District Municipality. It is situated in the far north- eastern part of the Limpopo Province, bordering the Republic of Zimbabwe in the north and the Republic of Mozambique in the east. The study areas were Tshilamba peri-urban area and Tshilavulu rural area (Fig. 1).

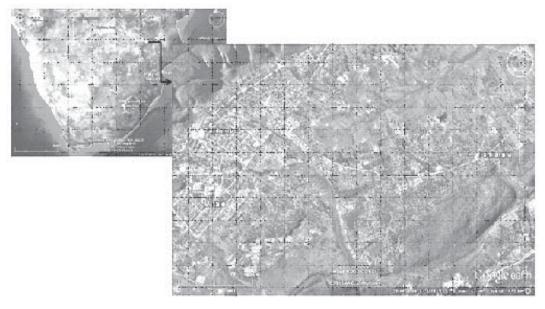


Fig. 1. The location of the Tshilamba and Tshilavulu in Mutale local municipality

#### **Data Collection**

The nature of the data and the problem for research dictate the type of research methodology to be used (Leedy 1993). The data categories included the primary and secondary data sources. Primary data included personal observations, questionnaires and informal interviews. Secondary data sourced include maps and official reports from newspapers, television and radio. The data collection procedure and sampling that was followed, was based on the study of Whittington (1998).

# **Community Survey**

The open-ended questionnaire was administered to households in Tshilamba urban and Tshilavulu rural areas. Three hundred and fourteen questionnaires were distributed to the study area: 65 distributed to Tshilavulu village and 249 distributed to Tshilamba urban area. These were distributed to households and were answered by persons who were either heads of the households or staying at the house at the time of the study. This survey was conducted to evaluate the water problems encountered in the two communities. The study was also used to raise the community's awareness on the water supply challenges faced by the municipality. Four field workers including the researcher, Mr Ranaga, all speaking Tshivenda the local language, carried out the task of interviewing the respondents and completing the questionnaires.

# Study Population and Sampling size

It was assumed that, the study population were all beneficiaries of water services provided by Mutale Local Municipality (MLM) and the head of each household was the main respondent. As described above, the beneficiary list (civic register) for the survey consisted of 24,239 water users. The sampling procedure of Krejcie and Morgan (1970) was followed and as a result, 10 per cent of the residents from the beneficiary list were sampled. Tshilavulu village, as the first study area, had the population of 654 in 150 households (Nemakhavhani T.J, personal communication); hence 65 questionnaires were distributed randomly following the names on the beneficiary list. The second study area, Tshil-

amba, had a population of 2,500 in 2,050 households (Nethengwe T, personal communication); hence 249 questionnaires were distributed randomly as in Tshilavulu.

### **Ethical Consideration**

Respondents, whose personal identities were not recorded, were interviewed at their right time and place of their choice to avoid the development of the negative attitude which could have encumbered the success of the research study. The consent of the respondents was sought at the beginning of the study. In addition, the respondents were asked to answer the questionnaire only to the best of their knowledge and were not pressured to confer the information.

#### **Data Analysis**

Data was analysed using the Statistical Package for Social Science (SPSS 16.0) software. The relationship between the dependent variable, which was the willingness to pay (how much per month), and the independent variables which were; gender, age, level of education, size of the household, employment status, major sources of income, length of the water shortages and monthly expenses was interpreted based on the Chi-square test for independence at a significance level of p < 0.05 at 95 per cent confidence interval.

### RESULT AND DISCUSSION

### **Demography and Household Size**

The entire Mutale Local municipality has a population of 24,239 households (Mutale 2012). The study area of Tshilamba urban area had a population of 2,500 residents and Tshilavulu village had a population of 654 residents. The division of the population in Tshilamba urban by the number of households showed that each household had on average two members. Whereas, in Tshilavulu, the division of the population by the number of households showed that each household had on average of five members. The differences in the number of members in each household may be due to the following reasons:

 Some households had no members living there as the houses were still under construction, although, the owners of such houses

- were regarded as the citizens of Tshilamba since their names were in the civic register.
- For some households the owners were available but the whole family was absent. The
  husbands only stayed there for work purposes only to go to their respective rural
  homes over the weekends.
- The majority of households, the owners worked in other provinces such as Gauteng, Free State and KwaZulu-Natal. The owners only returned home during holidays, but a relative or domestic worker stayed in the household, thus, only the owner's name was recorded in the civic register.

The accurate data on the demography of the study area is important since these figures may be used for future planning and projection. The determination of the demographic data is not only unique to this study, but the other case study in Iquitos city, Peru had to grapple to determine the actual number of residents in the city (Fujita et al. 2005).

#### Gender and the Head of Household

The study showed that 94.9 per cent of the respondents were heads of the households and only 5.1 percent not being household heads (3.8 percent were males and 1.3 percent the females). The study showed that 43.3 percent females were heads of household while 51.6 percent were males. This may be explained by a number of factors: in African culture married women are submissive to their husbands as the husbands are the recognised household heads (Tshesane 2001); or the husbands engage in migrant work far away in the big cities and come home during the holidays (Collinson et al. 2006); or child headed households and also single mothers may become head of the household (Woolard 2002). Nevertheless, the prime advantage for female headed household is the high awareness about water uses in the household and the location of water sources and daily collection of drinking water (Arouna and Dabbert 2012; Mezgebo and Ewnetu 2015).

# The Community's Satisfaction with the Current Water Services

All the sample data resulted from the two communities were combined and the result showed that, 10.2 percent of the residents were

satisfied with the current water supply services, while 89.8 percent of the residents were dissatisfied (Table 1).

Table 1: Satisfaction with the current water supply (N=314).

Satisfaction with water services?	Frequency	Percent
Yes	32	10.2
No	282	89.8
Total	314	100.0

A similar study in Nebelet town of Ethiopia found that 80 percent of the respondents were dissatisfied with current water services (Mezgebo and Ewnetu 2015). The reasons for dissatisfaction with current water service, the majority of residents complained of poor services (Table 2) and some of residents said that there was no water at prime time, wherein, most of them were at home after arriving from work.

Table 2: Reasons for the current dissatisfaction with current water services (N=314)

Reasons for dissatisfaction with water services	Frequency	Percent
No response	36	11.4
Because there is no water		
services or poor water services	125	39.7
Don't have a pipe stand in		
my home	29	9.2
There is no water in prime time	42	13.3
Because I am paying for air only	7 3	1.0
Because lack of water promotes		
poor sanitation	11	3.5
Because they just estimate		
high amounts	4	1.3
Poor maintenance of the water		
facilities	4	1.3
Incorrect meter reading	13	4.1
There is always low water		
pressure	4	1.3
I don't experience any		
water shortage	42	13.3
Cecause I hire a car to fetch		
water	1	0.3
Total	314	100

For the households that were satisfied (10.2%), with the current water services, the reason were that their homes were located on the downward slope and hence water services were always available. It can be deduced that the municipality should install pipes in all households without the connection. It must also in-

stall meters in all the households and introduce the prepaid water supply system, so that, all the respondents should pay for the amount of water they use in their household. The respondents should also receive frequent and accurate monthly statement of accounts on water services so that they can see the amount they spend on the water.

The municipal water supply was unreliable such that 39.2 percent of the respondents would spend about three weeks with no water supply. Most of these respondents who spent a week with no water supply lived in Tshilamba, a suburban area, where they are not allowed to have pit latrines at their homes since, their homes have flush toilets. As a result of the lack of reliable water supply for toilet flushing, the Tshilamba residents said that the service was very poor and or unreliable. The reason was probably lack of hygiene owing to and absence of flushing of toilets and affected bathing and other sanitary

practices. In addition, the respondents from the other study area, Tshilavulu village, complained about long weeks spent without water and were able to enjoy water services for short hours at any given time. Figure 2 showed the water supply challenges the respondents are facing in the study area.

# The Factors that may Influence Willingness to Pay for Water Services

Education level had an influence on the amount respondents were willing to pay, p = 0.000 as shown in Chi-square tests. The amount of money the respondents were willing to pay increased with the level of education; with 52.9 percent (28.5 percent female and 24.5 percent male) of respondents were willing to pay R100 to R150<sup>1</sup> per month per 6 kilolitre with those with tertiary education. The respondents with primary education and no education at all were willing



Fig. 2. Challenges on the availability of water services in Mutale local municipality: (A) a dry water tap in private household in Tshilavulu village; (B) a rundown public water stand pipe infrastructure in Tshilavulu village; travelling to fetch water (C) and a dry water tap in Tshilamba urban (D)

to pay a lesser amount of R10 to R50 per month per kilolitre for access to improved water services. The water consumption of 6 kilolitres per month is the minimum Reconstruction and Development Program (RDP) level in which the residents receive a subsidy (free basic water supply) and any consumption in excess of 6 kilolitres attracts payment (Faysse and Gumbo 2004; Kanyoka et al. 2008). On the issue of subsidy, the residents of Nebelet town, Ethiopia stated that to improve their water services the government should provide free and or subsidies water services (Mezgebo and Ewnetu 2015). Respondents with tertiary education were willing to pay more in comparison with non-tertiary respondents. The findings were similar to those from other studies where the level of education had an influence on the amount of money the respondents were willing to pay (Whittington et al. 1990; Kanyoka et al. 2008; Sale et al. 2009; Kanayo et al. 2013; Mezgebo and Ewnetu 2015). This was because, as the respondents were more educated and with better paying jobs and could not afford time to collect drinking water from the sources outside their homesteads. Thus, these respondents were willing to pay for a reliable water services instead of struggling to get water. The gender of the respondents did not to have an influence on the amount the respondents were willing to pay, p = 0.433. Normally, the female headed households would have a high willingness to pay (WTP) than the male headed household but for this case it was different. This was due to the fact that women were unemployed and their incomes were variable, mostly depending on remittances, hence the reason why female had a lower WTP compared to male in this study (Table 3).

Table 3: The sources of income for two communities of Tshilamba and Tshilavulu (N=314)

Sources of	Female	Male	Female	Male
income	Freque	епсу	Percen	t
Wage payment	5	7	3.4	4.2
Pensioners grant	5	11	3.4	6.6
Disability grant	0	1	0.0	0.6
Child grant	7	4	4.8	2.4
Foster care grant	5	1	3.4	0.6
Self employed	14	37	9.5	22.2
Remittances from outside Limpopo province	110	105	74.8	62.9
Private	1	1	0.7	0.6
Total	147	167	100	100.0

The research findings here are different from the case study of Whittington et al. (1987) that was carried out in Douentza, Mali in 1987, found that the difference in WTP for improved water supply services between male-headed household and female-headed household was statistically significant, as the female-headed households had higher WTP to that of the male-headed households. The high WTP in female-headed households could be explained by the report from the case study conducted by (Perez-Pineda 1999) in El Salvador, Central America, which stated that, "Willingness to pay for quality water service increased when the decision-makers were women, and was more likely to be sustainable if there was greater dissatisfaction with traditional water sources that involved a greater opportunity cost (the opportunity cost of the time involved in carrying water)".

The relationship between the size of the households and the amount that they were willing to pay was significant, p = 0.002. The size of the household was in the range of 3 to 6 members (Table 4).

Table 4: The number of persons in the household (N=314)

Number of members in the household	Frequency	Percent
Less than 3 people	35	11.2
Between 4 and 5 people	181	57.6
More than 6 people	98	31.2
Total	314	100.0

This could be explained by the fact that, when a family size was large, they would use more water and also having young children placed more demand on the use of more water. The research findings are in agreement with the Whittington et al. (1987) study in Douentza, Mali, which recognised that, the coefficient for household size was positive and significant thus, indicating that the feeling of urgency of meeting water needs as embodied in WTP increased with the number of people in the household.

It was shown that as the age increased, even the amount they were willing to pay increased, but up to a certain point. This point was probably the optimum level, and from there the willingness started to decrease. The age has also proved to be one of the important factors which influenced the willingness to pay for water services, hence p = 0.000 as shown in Chi-square. The amount increased with age until at the age of 35 to 40, and then the amount the respondents were willing to pay decreased up until the age of above 50 years (Table 5).

Table 5: The age of respondents in the study area (N=314)

The age bracket in years of respondents	Frequency	Percent
15 - 20	4	1.3
20 - 25	4	1.3
25 - 30	11	3.5
30 - 35	42	13.4
35- 40	98	31.2
40 - 45	53	16.9
45 - 50	52	16.9
Above 50	50	15.9
Total	314	100.0

The study by Mezgebo and Ewnetu (2015) also showed that the respondents of age above 50 years were less willing to pay more for improved water services in the short term. The respondents of ages between 35 and 40 had more dependents, the family size was big, and they also earned more money, hence they had a higher WTP than the other age groups. The research findings are similar to Mezgebo and Ewnetu (2015) on younger generation of 30 to 40 years

being more willing to pay for improved water services.

There was a significant, p = 0.005, relationship between the factors, employment status and income levels, and the amount the respondents were willing to pay. The respondents (94.2%) with the income of above R 5,000-00 were willing to pay the highest amount which was between R100 to R150 per 6 kilolitres per month. This was because these respondents were expected to use more water in their homes and hence, a reliable water supply was expected. The issue of higher incomes was also found by other studies as showing a positive correlation with WTP (Arouna and Dabbert 2012; Kanayo et al. 2013; Mezgebo and Ewnetu 2015)

The distance respondents travelled to fetch the water were another influencing factor on the amount the respondents were willing to pay for the water services, p = 0.000. When the distance to the public standpipe water tap was less than 200 m, 90.4 percent of the respondents were willing to pay (Table 6; Fig. 3). The research findings are similar to the study of Mezgebo and Ewnetu (2015) who found out that there was a positive correlation on willing to pay for improved water services with distance to the water source.

The distance of less than 200 m to the public standpipe water tap is part of the RDP to



Fig. 3. An example of standpipe with running water in Makhado local municipality. Note the use of containers to store extra water supplies

ensure that water supplies are closer to the households (Kanyoka et al. 2008). However, when the distance was greater than 200 m, a small percentage of respondents (9.6%) were willing to pay (Table 6).

Table 6: walking distance to collect water for drinking purposes (N=314)

Distance to water tap	Frequency	Percent
Less than 200 m More than 200 m	284 30	90.4
Total	314	100.0

The amount of money the respondents were willing to pay increased when the walking distance decreased but when the distance increased, even the amount of money they were willing to pay decreased. The research findings are in agreement with other studies, the opportunity cost of having a tap closer to the home or at a shorter distance was considered by the customers when paying for the water services (Whittington et al. 1990; Kanyoka et al. 2008; Rietveld et al. 2009). This was the reason many respondents were willing to pay for the water services when the distance was shorter than 200 m.

The length of the water shortages had an influence on the amount of money the respondents were willing to pay for the water service, p= 0.000. As the length of the water shortages increased, the amount the respondents willing to pay also decreased. The respondents, who experienced water shortages for a short period of time, such as for a day, had the highest WTP. This was due to the reason that they hardly felt the impact of water shortages as they were prob-

ably having reserve water for use during that short space of time. However, the respondents who spent from a week to months without water, had a lower WTP as they probably got acquainted with the situation and then looked for some alternatives to survive without the service from the municipality (Table 7).

These are mostly the respondents who resorted to boreholes, both the public and the private boreholes and other means, so they felt they would rather spend their money maintaining their current sources of water than on the services they were not enjoying (Kanyoka et al. 2008; Rietveld et al. 2009). In case of water shortages, the municipality should inform the respondents of the possible shortages in advance, so that there should be a good communication between the municipality staff and the community. The municipality should also provide the alternative water services through water tankers to every community if and when the water shortage is expected lasting two or more days.

#### **CONCLUSION**

The study evaluated the respondents' willingness to pay (WTP) for improved water services in two communities of Tshilamba peri-urban and Tshilavulu rural village of Mutale Local Municipality. The study has shown that the water services at Mutale Local Municipality were unreliable and 89.9 percent of the respondents were not satisfied with the water supply services. Those with tertiary level education were WTP more, R150 per month per 6 kilolitres of water supply. Then 95.5 percent of the respon-

Table 7: In times of municipal water shortages, the community used different sources for drinking water

Sources of water during municipal shortages	Female	Male	Female	Male
	Frequency		Percent	
Borehole	21	33	14.3	19.8
Buying from people with borehole	15	23	10.2	13.8
Use of private borehole	24	25	16.3	15.0
Use of public borehole	5	2	3.4	1.2
Use of school borehole	2	21	1.4	0.6
Use of river water	8	12	5.4	7.2
Obtaining water from another village	23	17	15.6	10.2
Use of townhall water tank	29	29	19.7	17.4
Use of water from Mutale health centre	1	0	0.7	0.0
Collecting water from Mutale purification plant	1	0	0.7	0.0
Other-not specified source of water	13	21	8.8	12.6
Total	147	167	100	100.0

dents' were WTP for the improvement in the water services to secure a reliable water supply service. The following variables: education level; household size of 3 to 6 members; the age of 40; High monthly incomes had a significant effect (p = 0.005) on the monetary amount were willing to pay. However, the gender issue was insignificant (p=0.433) on the monetary amount and probably since the head of the household was male. Besides, the unreliable water supply services in the municipality, many respondents were ardently willing to pay for the services if the municipality could improve the water services. This therefore, remained a challenge to the municipality to improve the water services to a satisfactory standard which would elicit an assurance of payment for the services by the respondents.

#### RECOMMENDATIONS

Based on the research findings, the municipality should introduce the block tariff system as a way of financing the water service; this system will allow cross subsidy between the users of water, as the rich respondents are willing to pay for water services. This system charges more money to the respondents who use more water, hence discouraging the misuse of water at the same time meeting the free basic water need for the indigents. The municipality should also conduct public meetings at the end or beginning of each year to get the respondents' report on their performance on water supply services in the previous year, and also to get criticism so that they can improve from them.

The municipality should install pipes in all households without the connection, meters in all the households and then introduce the prepaid water supply system so that, all respondents should pay for the amount of water they use in their household. The respondents should also receive accurate monthly statement of account on water services so that they can see the amount they spend on the water.

# **ACKNOWLEDGEMENTS**

The authors thank the Mutale Local Municipality and its officials for participating in the study and also giving permission for the study to be carried. The researchers also thank the residents of Tshilamba, Tshilavulu and Makwil-

idza village (pre-testing) for their active participation in the study. Mr HT Rananga acknowledges the scholarship from the Limpopo Provincial Department of Agriculture for postgraduate studies.

#### REFERENCES

Arouna A, Dabbert S 2012. Estimating rural households' willingness to pay for water supply improvements: A Benin case study using a semi-nonparametric bivariate probit approach. *Water International*, 37(3): 293-304.

Collinson M, Tollman SM, Kahn K, Clark S, Garenne M 2006. Highly prevalent circular migration: Households, mobility and economic status in rural South Africa. Africa on the Move: African Migration and Urbanisation in Comparative Perspective, 194-216. DWAF 1994. Water Supply and Sanitation Policy White

Paper. Cape Town: DWAF.

DWAF 2002. Users Manual Free Basic Water Planning Model: Version 1 Spreadsheet Model. Pretoria: DWAF.

Faysse N, Gumbo J 2004. The Transformation of Irrigation Boards into Water User Associations in South Africa: Case Studies of the Umlaas, Komati, Lomati and Hereford Irrigation Boards. Volume 2. Working Paper 73. International Water Management Institute, Colombo, Sri Lanka.

Fujita Y, Fujii A, Furukawa S, Ogawa T 2005. Estimation of Willingness-to-Pay (WTP) for water and sanitation services through contingent valuation method (CVM): A case study in Iquitos City, The Republic of Peru%. *JBICI Review*, 11: 59-87.

Kahinda JMM, Taigbenu AE, Boroto JR 2007. Domestic rainwater harvesting to improve water supply in rural South Africa. *Physics and Chemistry of the Earth, Parts A/B/C*, 32(15): 1050-1057.

Kanayo O, Ezebuilo U, Maurice O 2013. Estimating the willingness to pay for water services in Nsukka Area of South-Eastern Nigeria Using Contingent Valuation Method (CVM): Implications for sustainable development. *Journal of Human Ecology*, 41(2): 93-106

Kanyoka P, Farolfi S, Morardet S 2008. Households' preferences and willingness to pay for multiple use water services in rural areas of South Africa: An analysis based on choice modelling. *Water SA*, 34(6): 715-724.

Krejcie RV, Morgan DW 1970. Determining the sample size for research activities. *Educational and Psychological Measurement*, 30: 607-610.

Leedy PD 1993. Practical Research- Planning and Design. 6th Edition. New Jersey: Von Hoffman Press.
 Mackintosh G, Colvin C 2003. Failure of rural schemes in South Africa to provide potable water. Environmental Geology, 44(1): 101-105.

Mezgebo GK, Ewnetu Z 2015. Households willingness to pay for improved water service in urban areas: A case study from Nebelet town, Ethiopia. *Journal of Development and Agricultural Economics*, 7(1): 12-19.

Mutale Local Municipality IDP 2007. Mutale Local Municipality Integrated Development Plan. Mutale: Mutale Local Municipality.

- Mutale Local Municipality WSDP 2007. Mutale Local Municipality Water Services Development Plan 2006/2007. Mutale: Mutale Local Municipality.
- Mutale 2012. Integrated Development plan (IDP) for 2012-2016. From <a href="http://www.mutale.gov.za/docs/idp/FINAL%20%20IDP%202012%20final.pdf">http://www.mutale.gov.za/docs/idp/FINAL%20%20IDP%202012%20final.pdf</a> (Retrieved on 15 January 2015).
- Nethengwe TJ 2008. Personal Communication: Tshilamba Civic Chairperson, Magiledzhi Primary School Educator
- Nemakhavhani TJ 2008. Personal Communication: Tshilavulu Civic Representative: S.T. Augustine School Educator.
- Oberholster PJ, Botha AM, Cloete TE 2008. Biological and chemical evaluation of sewage water pollution in the Rietvlei nature reserve wetland area, South Africa. *Environmental Pollution*, 156(1): 184-192.
- Perez-Pineda F 1999. Estimating the Willingness to Pay for Improved Water Quality and Sanitation in Four Rural Communities of El Salvador Using the Contingent Valuation Method. From<a href="http://docs.lib.purdue.edu/dissertations/AAI3017668/">http://docs.lib.purdue.edu/dissertations/AAI3017668/</a> (Retrieved on 20 May 2010).
- Rietveld LC, Haarhoff J, Jagals P 2009. A tool for technical assessment of rural water supply systems in South Africa. *Physics and Chemistry of the Earth*, 34: 43-49.

- Sale MC, Hosking SG, Preez du M 2009. Application of the contingent valuation method to estimate a recreational value for the freshwater inflows into the Kowie and the Kromme estuaries. *Water SA*, 35(3): 261-270.
- Tshesane M 2001. Women abuse in the family context: an ethological approach. *Crime Research in South Africa*, 3(3): 1-8.
- Whittington D, Lauria D, Okun D, Mu X 1987. An Assessment of Water Vending Activities in Developing Countries. *Working Paper 185*, Arlington, Va, WASH
- Whittington D, Briscoe J, Mu X, Barron W 1990. Estimating the willingness to pay for water services in developing countries: A case study of the use of contingent valuation surveys in southern Haiti. *Economics Development and Cultural Change*, 38(2): 293-311.
- Whittington D 1998. Administering contingent valuation surveys in developing countries. *World Development*, 26(1): 21-30.
- Whittington D, Boland JJ 2002. Water Tariffs and Subsidies in South Asia. Understanding the Basics. Washington D.C., Public Infrastructure Advisory Facility, Water and Sanitation Program, World Bank and World Bank Institute: 16.
- Woolard I 2002. An Overview of Poverty and Inequality in South Africa. *Unpublished Briefing Paper*. HSRC: Pretoria.

# **APPENDIX** 1

Questionnaire	on the	willingness	to pa	y for	water
service in Tsh	ilamba	and Tshila	vulu	villag	e

# **General Instruction**

This household has been selected randomly from the civic register to participate in this study. No risk is associated with this study and participation is voluntary with no benefits or penalty for not participation.

Topic: Evaluation of willingness to pay for (WTP) for improved water services: Mutale Local Municipality case study.

# Introduction

These questionnaires are compiled and distributed by Mr. Rananga H.T, Honours' student in the University Of Venda, Department of Hydrology and Water Resources to acquire data on the people's willingness to pay for improved water services in Tshilamba and Tshilavulu village.

#### Questionnaire

Section a – Demography	
Area	
Gender	

You are kindly requested to make a cross or even to tick in the corresponding box provided and fill on the provided space. You can choose more than one if possible.

1. Who is the head of the household?

Myself	
Father	
Mother	
Relative	

Other (Specify).....

2. What is the highest level of education you have attained?

None	
Primary	
Secondary	

3. How old are you

15 – 20	
20 – 25	
25 – 30	
30 – 35	
35 – 40	
40 – 45	
45 - 50	
50 and above	
	I

4. How many are you in the family

Less than 3 people	
4 people	
More than 6 people	

Other.....

- 5.Employment statusEmployedUnemployed
- 6. Indicate your major source(s) of income:

Wage payment	
Pensioners grant	
Disability grant	
Child grant	
Foster care grant	

Other, specify.....

7. How
Less than R500 much is your monthly income?
R500 - R1000
R1000 - R1 500
R1 500 – R2000
R2000 - R5000
Above R5000

8.	What :	is you	ır esti	mated	expen	diture	per	month	in
the	follov	ving;	food,	school	fees,	clothi	ng,	electrici	ity
etc	.?								

Less than R500	
R500 - R1000	
R1000 - R1 500	
R1 500 - R2000	
R2000 - R5000	
Above R5000	

Section B - Access to water

9. Where do you get water from?

Piped water	
Borehole	
Springs	
River	

10. If piped water, where is it located Inside the yard

Outside the yard

11. How far is it?

Less than 200m	
More than 200m	

12. Who is the owner of the pipe?

Its mine	
Its my neighbour's	
It's the municipality	
13. Do you pay for the water service?	
Yes	
No	

14. If yes, how much do you pay?

R10 - R50	
R51 - R100	
R100 - R150	
Above R150,	

Specify	
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5	If no	why	are	VOII	not	navino?	

16. Do vou experience water shortages and low water

16. Do you experience water shortages and low water pressure?

Yes	
No	

17. If yes, how long is the shortage? Less than 3 hours a day

More than 3 hours a day	
A day	
A week	

Other (Specify).....

18. How many days in advance are you informed of the water shortage?

I am not informed	
Just five hours before the water shortage	
A day before	
A week before	

Other			

 $19.\ \mbox{In times}$  of water shortages and low pressure, where do get the water?

Borehole	
Well	
River	

Other (specify) .....

- 20. Has there been any case of water-borne disease?YesNo
- 21. Are you satisfied with the current water supply service?

No	Yes	
	No	

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Section c- Willingness to Pay

23. If you will receive satisfactory water services, with water more than 12 hours a day and a high water pressure, would you be for or against paying for water services?

,

Above R150, specify
25. What is the most you would pay for?
?
Thank you for your co-operation on this research!
$\frac{1}{1} R7.50 = USD1 (01/04/2010)$