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# DETERMINANTS OF RURAL HOUSEHOLDS' WILLINGNESS TO PAY FOR POTABLE WATER IN OYO STATE, NIGERIA

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**ABSTRACT:** One of the Millennium Development Goals is expansion of access to safe and reliable water sources to all by 2015. Rural areas in Nigeria are characterized with lack of access to potable water which has contributed adversely to public health and welfare of the rural dwellers. Concerted efforts have been made by government to improve access to safe drinking water. This study was therefore carried out to examine willingness to pay for potable water by rural households. A multistage sampling method was used to obtain a sample size of 107 respondents for the study. Descriptive statistics and logistic regression model were used to analyze the data. The respondents were mainly male, married with mean household size of four and mean age of 44 years showing that a good proportion of the sampled respondents were in their economic active age. Community well and streams were the most common water sources while none of the households had access to piped water. The Mean Willingness to Pay (MWTP) for water from safe sources was found to be N150 (0.91$)/20litres. Results also revealed that educational status, household monthly income, quality of water, reliability of water, connection charges, and distance to water source are the significant factors that influence the probability of households' willingness to pay for potable water. Therefore, in designing improved water supply system and services for rural areas, water service providers must ensure reliable service, improved quality water and proximity to the source.

**KEYWORDS:** Willingness to pay, Rural Nigeria, Choice, Water source, Potable water

## INTRODUCTION

Water is one of the most valuable natural resources vital to the existence of any form of life. An adequate supply of safe and clean water is the most important precondition for sustaining human life, for maintaining ecosystems that support all life and for human safety [1]. Undoubtedly, water is required by virtually all living things and it consumption and uses stretch to limitless bounds. It is an essential component of life, and its availability and quality are crucial. Although, domestic water consumption accounts for only 10% of the total water use in world[2], the benefits related to an improved water supply, such as effects on health, time savings and high productivity, are quite immense[3]. For a household to fully benefit from an improved water supply, it must have access to safe and reliable water sources. While this is almost always found in developed countries, such access is far from a reality in developing countries, especially in rural areas. Genuine concerns have been raised about inadequate access to improved water sources. The expansion of access to safe and reliable water sources, especially in Africa and Asia, is therefore one of the "Millennium Development Goals". In Nigeria, access to an improved water supply especially in the rural area remains a major concern.

Inspite of the importance of water, a global paucity of safe drinking water had been established [4]. Specifically [5] reports that 1.1 billion people representing 18% of the world's population lack access to safe drinking water, with larger proportion of these people located in the rural than urban areas. This is due to population growth, which may consequently increase in coming years unless serious massive investment in supply infrastructure are undertaken to stem the tide.

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Many people especially in developing countries do not have access to safe and adequate water services. Most of the people of these countries depend on unsafe, expensive and inconvenient water services. Even people who do have piped connections do not get enough water. Of the total urban dwellers in Africa 44 million people, in Asia 98 million people and in Latin America and Caribbean 29 million people do not have access to clean potable water services. Therefore providing adequate and safe water to the people at the right location and at the affordable price is one of the main problems of developing countries. The average, each person requires almost 50 liters per day for drinking, bathing, cooking and other basic needs [5]. Unfortunately, areas of water scarcity and stress are increasing. African nations are more affected as the continent presently has the lowest access to water supply, lowest level of development and utilization of water resources relative to its needs and the lowest capacity to address these challenges. This has been due to a number of factors. The critical factors include phenomenal increase in population, rising agricultural demand, urbanization and associated water stress, as well as frequent droughts in the arid and semi-arid regions of the continent, where drought- induced water scarcities have brought social shocks on incipient fragile economies. The shortage of plentiful and clean water is a critical problem that threatens the health and well-being of much of the world's population. The lack of adequate and safe water for drinking, bathing and other household tasks is a direct threat to health. Further, agricultural efficiencies and rural livelihoods are jeopardized by water shortages, as it is to the environment generally. Therefore, water scarcity constitutes a threat to access improved and safe water.

Nigeria ranks amongst the countries with the lowest level of potable water supply in the world, despite the fact that Nigeria was a signatory to the International Water Decade (1981-1990). The status of urban and rural water supply are characterized by low level of coverage which could be as result of weak political and governmental commitment, and lack of operation and maintenance culture for existing facilities, poor workmanship by contractors etc. The consequence of the failure to provide safe water has caused a large proportion of the population to have resorted into the consumption of potentially harmful sources of water. The implications of this collective failure are dimmed prospects for the billions of people locked in a cycle of poverty and disease. After almost sixty years of water supply development in Nigeria, it is regrettable that only 60% of the population has access to safe drinking water, and in rural areas less than 50% of the households have access to good portable water [6]. Rural people in the country still depend very much on rivers, streams, ponds, and shallow wells for their water needs. During the dry season, some of these sources dry up and households have to invest a substantial amount of their resources to get water of doubtful quality. This has very serious implications for the health of the people and economic development in the country. First, there is tremendous economic waste involved in people spending so much time and effort in search of water. Secondly, lack of water often means relatively low levels of personal hygiene and environmental sanitation. Thirdly, because water is needed for most productive activities, inadequate access to water limits the livelihood options of the people, particularly in rural areas.

Systematic development of water supply and management in Nigeria dates back to the colonial times. Although there was a steady increase in the percentage of the total government expenditure spent on water between 1975 and 1992; between 1992 and 1996, there was a 50% decrease in the total budgetary allocation for water supply [7;8]. The implication of this is that between 1992 and 1996, the total water supply for industrial, agricultural and domestic use increased at a rate of about 1.0% whereas population growth rate was 2.84% [9]. Apart from the relatively low level of financial commitment to water supply development in general, successive governments in the country also laid emphasis on urban water supply while rural areas are almost completely neglected. The Federal Government, through the River Basin Development Authorities (RBDAs) in 1976 and Directorate of Food, Roads and Rural Infrastructure (DFRRI) in 1986 attempted to address the problem of rural water supply in the country. Through the two strategies, a large number of boreholes with manual and powered pumps were sunk in various parts of the country. Pipe borne water was also extended to some rural areas through the state water corporations, but this option was hardly used because of the high cost of laying pipes to rural communities which are generally separated by large distances [10].Regrettably, these efforts did not last up to a decade. Many of the rural communities that were served with boreholes were unable to derive maximum benefits.

Despite that water is one of the most abundant resources on earth, less than one percent of the total supply is reliably available for human consumption. Competition among agriculture, industry and cities for limited water supplies is already constraining development efforts in many countries. As populations expand and economies grow, the competition for limited supplies will intensify and so will conflicts among water users. Despite water shortages, misuse of water is widespread. Small communities and large cities, farmers and industries, developing countries and industrialized economies are all mismanaging water resources. Surface water quality is deteriorating in key basins from urban and industrial wastes. This has left majority of rural communities vulnerable to threats associated with absence or lack of potable water.

Only 23% of the total population in Nigeria has drinking water within their residence despite Nigeria's good level of per capita water availability. Likewise, recent estimates have indicated that only 54% of the rural population and 76% of the

urban population have access to improved drinking water sources [5] leaving larger proportion of the rural population vulnerable to water borne diseases.

Given inadequacies in water infrastructure, rural households incur large time costs associated with gathering water. These costs are disproportionately borne by women and children, who also are most vulnerable to disease and food shortages that arise from a lack of access to safe and sufficient supplies of water. Improvements to water supply infrastructure can therefore have a range of benefits, with one of the potential benefits being the time savings resulting from reductions in time required to fetch water. One study estimates that time savings would account for 63 per cent of the total economic benefits from achieving the Millennium Development Goals target for water supply[4]. Nigeria like any other developing countries has many constraints to make potable water easily accessible. According to Global water and sanitation assessment 2000 report only 24% of the total population, 73% of urban population and 13% of the rural population have access to safe and clean water. As a result, in most parts of the country many people loss most of their time to fetch water from rivers, natural springs and other sources.

The quality of water consumed determines the drinking water security and subsequently health and agricultural productivity status of households. In this regard, household perceptions on water quality are crucial in determining household health production and water treatment decisions.

It is generally believed and this was confirmed by [11] that the economic situation of the rural communities may not necessarily support commercialization of potable water supply. However, the crave for a consistent and reliable water source by the rural dwellers created the need to research into the willingness to pay for alternative water source by the household outside the public water source bearing in mind that a private organization is profit oriented.

Considering the demand for potable, the development efforts encourage bottom up approach (that is, households meeting their water needs collectively) to providing water supply services to the end users in order to ensure sustainability. Recent reforms in Nigeria are hinged on private participation in governance. It is in view of this that the study was carried out to examine the willingness to pay for improved water services in the area of study.

Due to high investment, operation and maintenance costs, it is difficult for the government to provide safe potable water services free of charge. The service users are required to pay for the water service they get from the improved source. Thus, information on the amount of money the service users are willing to pay for the improved service is essential for potable water development projects.

Also many of the piped connections are not available in the rural areas, identifying their preference amongst the existing options to them will help inform the government in areas for possible interventions. Therefore, the findings of this study give useful information that may be very important for policy makers for water development project of the study area.

While several studies have being conducted in developed countries such as U.S.A., Italy, Belgium etc and some urban cities in Nigeria, rural areas have been neglected. This study therefore aims at filling this gap in literature. Specifically, the study examines the existing sources of water and their general characteristics, problems associated with obtaining potable water, and identify the determinants of household willingness to pay for potable water.

## MATERIAL AND METHODS

The study was carried out in Akinyele Local Government area of Oyo state, Nigeria. Akinyele local government area occupies a land area of 464,892 square kilometers with a population density of 516 inhabitants per square kilometer. Using 3.2% growth rate from 2006 census figures, the 2010 estimated population for the Local Government is 239,745.Oyo State is located in the South Western part of Nigeria and has 33 Local Government Areas with estimated population of 6,617,720. The Local Government Area has her large proportion constituted of the rural areas. The study focused mainly on the rural areas where majority of the households lack access to potable water source. The people are predominantly small scale farmers. They also engage in trading while few rear livestock. In addition, a lot of local processing of agricultural products takes place.

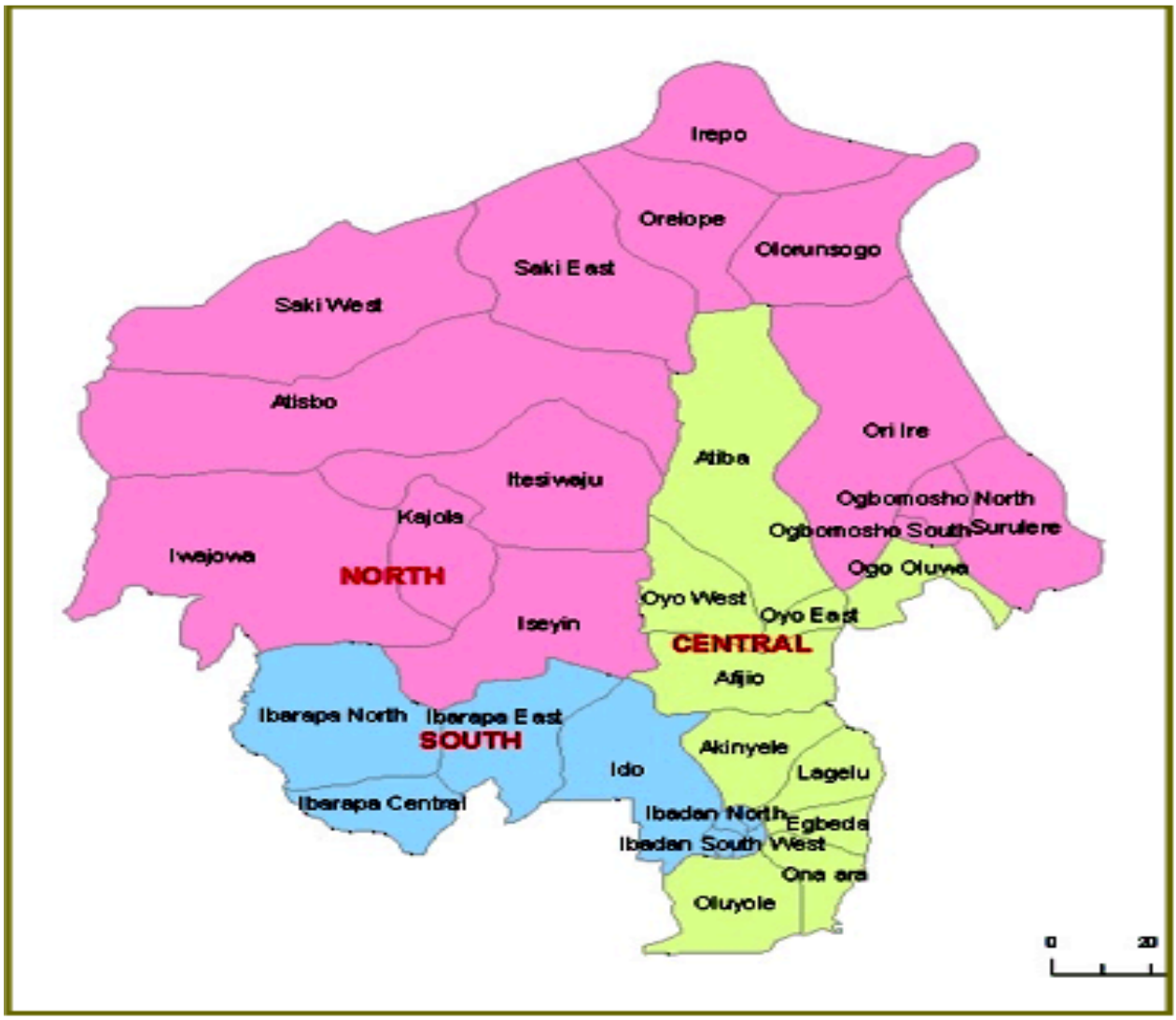


***Figure1. The Map of Oyo State, Nigeria Showing the 22 Local Government Area of the State***

A multi-stage sampling method was used in sampling the respondents. The first stage involved the purposive selection of communities that are predominantly in the local government area. These communities include Ikereku, Olanla, Idi-Iroko, Alabata and Olorisa-Oko. In the second stage, households were randomly selected and interviewed. The questionnaires were distributed based in sizes proportionate to the number of inhabitants in the different communities. The distribution is as follows: Ikereku(30), Olanla(13), Idi-Oro(24), Alabata(25) and Olorisa-Oko(15). In Olanla and Idi-Oro, the number of respondents exceeded the proposed sample by 3 and 4 respectively as they volunteered to be interviewed. About 107 rural household heads were sampled in total. Data were collected on their general socio-economic characteristics, water source and use and problems of obtaining potable water and willingness to pay for potable water.

Descriptive analysis such as frequency distribution tables, mean and standard deviation were used to analyse the socioeconomic characteristics of the household head, household characteristics and group characteristics. The logistic regression model was used to analyse determinants of the willingness to pay for potable water by households. The logit model which is based on the cumulative probability function was adopted because of its ability to deal with a dichotomous dependent variable and a well-established theoretical background. Logistic regression, according to [12; 14] is a uni/multivariate technique which allows for estimating the probability that an event will occur or not through prediction of a binary dependent outcome from a set of independent variables. The model is specified following willingness to pay for improved conservation of environmental species [13] and willingness to pay for improved household solid waste management in Ibadan North Local Government Area, Oyo State [15].

A household - level regression model is estimated thus:

Prob(*Yi* =1) = *f*(*b*k*Xk* + *biXi* + *ui*) (1)

where *Yi* is the dummy variable for household *I* who are willing to pay for potable water. *Xk and Xi are* vectors of exogenous variables affecting household decision to pay. [11; 17] identified these factors to include household characteristics, economic characteristics and water source characteristics. In this paper, we hypothesize that household characteristics, economic characteristics, water source characteristics affect the willingness of rural households to pay for potable water.

Also, *bk* and *bi* are vectors of parameters to be estimated, *ui* is a zero-mean error term, and *f*(.) is a probit or logit function. [16] argues that in most applications, both probit and logit models are quite similar. The main difference however, is that the conditional probability Pi approaches zero or one at a slower rate in logit than in probit. He concludes that there is no compelling reason to choose one over the other, and in practice, the choice depends on the ease of computation, which is not a serious problem with sophisticated statistical packages that are now readily available. The model estimates are in 0-1 range and these probabilities are non-linearly related to the explanatory variables. In this paper, the logit model is employed to estimate the parameters of the model. Variables included in the model are presented as follows:

Y = Responses of household WTP (1 if household is willing to pay for potable water and 0 if not)

*Household characteristics*

$X_1$= Age of household head in years

$X_2$=Household size

$X_3$= Gender of household head (male=1, female=0)

$X_4$=Educational level (Number of years spent in the school)

*Economic characteristics*

$X_5$=Household monthly income in Naira

*Source Attribute*

$X_1$= Quality of the water (Good quality=1, otherwise=0)

$X_2$= Reliability of the source (Reliable=1, otherwise=0)

$X_4$= Collection time in minutes

$X_5$= Level of Satisfaction (1 if yes, 0, otherwise)

$X_6$= Household distance from source in km

## RESULTS AND DISCUSSION

Table 1 presents the distribution of the respondents by socioeconomic characteristics. The age range of the respondents revealed that more than half of the population, that is, 75percent was below 50 years of age, with the mean age of all the interviewed households being 44 years, minimum and maximum age were 21 and 75 years of age. This showed that a good proportion of the sampled respondents are in their economic active age. The result revealed that male and female headed households sampled were 82 percent 18 percent respectively. Most of households are headed by males. The reason for this can be due the cultural norms and setting of the study area, which makes males the breadwinners and head of households. Therefore, more of the male folks might have been sampled due to their position as household heads rather than that there were fewer females that consume water.

Findings further revealed that while only 80percent of the respondents have no formal education about 20 percent had post-secondary school education. Majority of rural dwellers have no formal education which may influence their willingness to pay for potable water. The educated the respondents, the more likely they would be willing to adopt and use potable from improved water system having the knowledge of the consequences of shortage in water supply or its unreliability.

Also, the household size of the respondents as shown by the results indicated that 75 percent had between 1 and 5 household members, 23 percent had between 6 and 10 members while 2 percent accounted for those that have above 10

household members. The average household size was about 4 while the minimum and maximum household sizes are 1 and 12 respectively. The level of household income is generally low, about 52percent of the respondents earn on a monthly basis about $200 or less while about 13percent earn US$600 as monthly income. The average household income was about US$119, with the lowest and the highest being US$33 and US$762/month/household respectively. As the level of income increases, the probability that households would want to pay for water from safe sources also increases.

***Table 1. Households Socioeconomic Characteristics of Respondents***

| Variable | Percentage | Minimum | Maximum | Mean |
|---|---|---|---|---|
| Age(years) | | | | |
| 21- 30 | 14.0 | 21 | 75 | 44 |
| 31- 40 | 29.0 | | | |
| 41-50 | 32.0 | | | |
| 51-60 | 15.0 | | | |
| 60 and above | 10.0 | | | |
| Gender | | | | |
| Male | 82.0 | | | |
| Female | 17.0 | | | |
| Household size | | | | |
| 1-5 | 75.0 | 1 | 12 | 4 |
| 6-10 | 23.0 | | | |
| 11 and above | 2.0 | | | |
| Education(years) | | | | |
| No Formal Education | 10.0 | | | |
| Primary Education | 12.0 | | | |
| Secondary Education | 27.0 | | | |
| Tertiary Education | 51.0 | | | |
| Primary occupation | | | | |
| Fishing | 12.0 | | | |
| Farming | 63.0 | | | |
| Traders | 20.0 | | | |
| Unemployed | 6.0 | | | |
| Households monthly income | | | | |
| $200 and below | 52.0 | $33.0 | $762.0 | $119.0 |
| $201-$400 | 24.0 | | | |
| $401-$600 | 11.0 | | | |
| $600 and above | 13.0 | | | |

*Source: Field Survey, 2013*

The source of domestic water for different household depends on its use. The domestic uses considered in this study are drinking, cooking, washing and bathing. The source of water for different uses is not homogenous for the same household. However, table 2 presents the various sources of water and the number of households that use them for the various domestic uses. The major source of water for drinking is from private/community well without pump because they are with covering plates, readily available and accessible. Another common source is rain water. The belief is that rain water is clean and if collected in clean storage containers, they are considered safe. The least number of households use is water from public piped water. This is due to non – availability of this source of water to many households.

Water from private well without water pump and rain water are the commonest sources of water for cooking. This reason is that since water will still be boiled in the process of cooking, these sources are considered safe for cooking. The common sources of water used for washing are private well without water pump, rain water and streams. The least used sources of potable water for this purpose include borehole. The pattern of use of water source for bathing is similar to that of washing. In all, private well without pump(54%) and streams(34%) is used by most respondents (54percent) for all domestic uses. The least used are public piped water because they were not available and accessible by the rural dwellers.

***Table 2. Distribution of Respondents by Water Sources and their Uses***

| Use / Source | Drinking (% ) | Cooking (%) | Washing (%) | Bathing (%) | All domestic use (%) |
|---|---|---|---|---|---|
| Private well without water pump | 46.0 | 55.0 | 58.0 | 60.0 | 54.0 |
| Public piped water | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Private borehole | 34.0 | 20.0 | 10.0 | 14.0 | 2.0 |
| Public borehole | 23.0 | 14.0 | 5.0 | 7.0 | 17.0 |
| Ponds and streams | 25.0 | 21.0 | 5.0 | 3.0 | 34 .0 |
| Rain water | 81.0 | 53.0 | 44.0 | 16.0 | 37.0 |

*Source: Field Survey, 2013.*

Note that percentages do not add up to 100 percent due to multiple respondents.

As shown in the table 3, majority of the respondents depend on private well without pump. This agrees with the study of [17] put private well without water pump as primary source of water for majority of their respondents in Oshogbo (48.62 percent). Thirty five percent of households depend on this source for domestic use, 20 percent depend on ponds and streams while only 10 percent depend on public borehole. None of the respondent depends on public pipe

***Table 3. Distribution of Respondents by Primary Water Source Use***

| Water source | Percentage |
|---|---|
| Private well with water pump | 19.0 |
| Private well without water pump | 35.0 |
| Private borehole | 16.0 |
| Public borehole | 10.0 |
| Ponds and streams | 20.0 |
| Total | 100.0 |

*Source: Field Survey, 2013*

As shown in the table 4, majority (75 percent) of the respondents prefer private borehole and public piped water while the least preferred source being ponds/streams. The preferred water source by the respondents is premised on perception on potablity of the source.

***Table 4. Distribution of Respondents by Preferred Water Source***

| Water source | Percentage |
|---|---|
| Private well with water pump | 13.0 |
| Private well without water pump | 3.0 |
| Public piped water | 32.0 |
| Private borehole | 45.0 |
| Public borehole | 5.0 |
| Water vendors/sachet water | 1.0 |
| Rain | 1.0 |
| Total | 100.0 |

*Source: Field Survey, 2013*

As shown by table 5, the average amount of water used daily by the households was 160 litres. Majority of the respondents (59 percent) consumed between 120-200 litres of water daily while least number of respondents consumed 400 litres and above. This may be reflection of the household composition in term of household size. However, the average of amount of water consumed daily per head was 40 litres.

There is a wide difference between the minimum and maximum average amount of water used by households which are 10 and 700litres respectively.

***Table 5. Distribution of Respondents by Amount of Water Consumed Daily***

| Amount in litres | Percent |
|---|---|
| 20-100 | 29.0 |
| 120-200 | 59.0 |
| 220-400 | 9.0 |
| >400 | 3.0 |
| Total | 100.0 |

*Source: Field Survey, 2013.*

Table 6 shows that the most severe constraint faced by households in the study area in obtaining potable water is unreliability of water supply from the source. The second most severe problem faced by households is water pollution due to infiltration of run-off. One of the reasons that can be adduced to this is that private wells which serves as primary water source for 35 percent of the respondents were not deeply dug therefore there is always run-off to the well when it rains. However, the disconnection from water grids appeared to be a minor problem as it was ranked ninth among the constraints in table 6. This was attributed to the fact that a very small percentage of households in the study area had access to private borehole and none of them had access to piped water.

***Table 6. Distribution of Problems of Obtaining Potable Water by Households.***

| Problem | Percentage | Rank |
|---|---|---|
| Unreliability of water supply from the source | 59.0 | 1 |
| Water pollution due to infiltration of run-off | 57.0 | 2 |
| Low water table | 53.0 | 3 |
| Low water quality | 45.0 | 4 |
| High connection fee | 29.0 | 5 |
| Erratic power supply | 26.0 | 6 |
| High price of water | 15.0 | 7 |
| Poor water management | 15.0 | 7 |
| Disconnection from water grids | 10.0 | 9 |

*Source: Field Survey, 2013*

As shown in table 7, majority of the respondents are willing to pay for portable water with 67 percent willing to pay while 33 percent of the respondents are not willing to pay for potable water.

***Table 7. Distribution of Number of Respondents Willing to Pay for Potable water***

| Willingness to Pay | Percentage |
|---|---|
| No | 37.0 |
| Yes | 67.0 |
| Total | 100.0 |

*Source: Field Survey, 2013.*

Table 8 reveals that about 20.7 percent of respondents that are willing to pay, offered to pay between 1-40 Naira while the remaining 79.3 percent are willing to pay above 40 Naira for 20 litres of water from a potable water source. The mean amount that the respondents are willing to pay for 20 litres of potable water is 48 Naira and the coefficient of variation of 0.9217 reveals that there is high variation in the distribution of the amount willing to pay for a bucket (20 litres). However, the maximum amount respondent are willing to pay per 20 litres of water from potable source by respondents is 250 Naira.

*Table 8. Distribution of Amount Willing to Pay for Potable Water by Respondents*

| Willingness to Pay | Percentage |
|---|---|
| 1-40 | 20.7 |
| 41- 80 | 9.5 |
| 81-120 | 23.8 |
| Greater than 120 | 46.0 |
| Total | 100.0 |

*Source: Field Survey, 2013*

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***Determinants of Willingness to Pay for Potable Water:*** Table 9 presents the estimated coefficients of the explanatory variables (determinants) and the marginal effects of a unit change in these variables on the probability of rural household's willingness to pay(WTP) for potable water. The diagnostic statistics reveals that the chi square value for the model is significant at the 1% level which means that the explanatory variables jointly influence household's willingness to pay. The signs show the direction of change in the probability of the willingness to pay for potable water given the change in the explanatory variables. A positive sign shows increase in the probability of willingness while a negative explains the converse.

The results further showed that respondents' age, household size, gender and time of water collection do not significantly influence the probability of household's willingness to pay for potable water. However, six variables are found to significantly influence their willingness to pay. These are households' educational status, monthly income of households, quality of water, reliability of water, connection charges and distance from water source. Education status, household monthly income, quality of water and reliability are positively signed which implies that they will increase the tendencies of households willingness to pay for potable water. Education status is positively signed which means that highly educated and informed households have higher probability of willing to pay for potable water. This is in line with [1] which found that education enhance household participation in seeking for improved water services. Monthly income has a positive effect on the household willingness to pay. Well-off households may prefer to have their own source who can serve them with potable water at all times. Also, Quality of water is positively signed which implies that household will be willing to pay for water which is of good and certified quality. Reliability of water is positively signed which implies that water source whose quality and accessibility may enhance household willingness to pay. But, connection charge has a negative sign meaning that high connection charges may reduce the tendencies of household willingness to pay for potable water. This is in line with [17] which found that high connection charges discourage rural household decision to seek for improved water supply. The household distance from water source and the collection time have an inverse relationship with the probability of willing to pay. The farther the household is from the water source and longer the time of collecting water, the less the probability of willingness to pay. This is not unexpected considering the drudgery of collecting water particularly on long distances.

In all among the variables in the model, age educational status, marital status, household wealth index, collection time and source of water have positive signs which imply that a unit increase in any of these variables will lead to increase in the probability of households' willingness to pay. While variables such as household size, quality of water source, reliability of water source, quantity of water and level of satisfaction have negative signs which means that a unit increase in any of these variables will lead to increase in the probability of households' for willingness to pay for potable water

*Table 9. Factor affecting decision of rural household willingness to pay for potable water*

| Variable | Coefficient | P (Z/Z) | Marginal effect |
|---|---|---|---|
| Age | -0.028 | 0.276 | -0.006 |
| Household size | 0.336 | 0.719 | 0.099 |
| Gender | 1.115 | 0.365 | 0.457 |
| Educational status | 0.493*** | 0.004 | 0.118 |
| Monthly income | 0.590* | 0.083 | 0.049 |
| Quality of water | 0.247*** | 0.001 | 0.068 |
| Reliability of water | 0 .005** | 0.011 | -0.047 |
| Connection charge | -0.337*** | 0.001 | -0.506 |
| Distance from water source | -0.236** | 0.013 | -0.229 |
| Collection time | -2.382 | 0.822 | 0.002 |
| Constant | 1.417** | 0.004 | - |
| *Number of observations =107* | *Pseudo $R^{2-}$ = 0.475* | *LR chi square(13) = 39.570* | |
| *Prob > chi2 = 0.000* | *Log likelihood = -128.373* | | |
| ****Significant at 1%level, ** Significant at 5%level, *Significant at 10%* | | | |

## CONCLUSION

This research has examined the various attributes of water sources and the findings of the of this study revealed that rural area in Nigeria is characterized by low level of access to improved source of domestic water irrespective of the abundant stock of water resources in the area. Supplies from improved sources are largely inadequate while these sources are usually distant away from the households in the study area particularly public borehole. Private wells are without water pump which are considered unsafe remains the major of water, households, however households are willing to pay for potable water if the supply will be reliable and water can be obtained in adequate quantity and quality. Although, private borehole is the most preferred, due to its high cost of construction and maintenance, it is not accessible to most respondents.

The following recommendations are made on the basis of findings from this study. The educational status and monthly income of respondents has positive relationships with WTP for potable water. Thus, provision of potable drinking water could be accelerated through a policy instrument that will increase rural income reasonably. Similarly, increasing the enrolment for formal education at all levels and introduction of water and environmental education as one of the subjects at all levels of education is recommended as this will greatly boast households' WTP for potable water and equally improve water use practices.

Owing to lack public piped water in the study area, government and non-government can initiate community based self-help effort in construction of more public boreholes in order to make provision of potable water available at a very low cost.

Although, this research does not concentrate on measuring water quality, however, it is universally agreed that piped water constitutes safe water. Therefore, it is recommended that efforts by government should be geared towards ensuring that every household in Akinyele local government has access to piped water.

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