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**ASSESSMENT OF FACTORS INFLUENCING WATER NEED TO SUPPLY FOR  
LIVELIHOOD ACTIVITIES IN MAKURDI URBAN AREA, BENUE STATE- NIGERIA**

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**ABSTRACT**

The study assesses the factors influencing water need to supply for livelihood activities in Makurdi urban area of Benue State, Nigeria. Variables considered base on water need to supply and used for the study include: urbanization, absence of storage facilities, ownership of water facilities, vandalism, poor maintenance, misappropriation of water funds, rapid population growth among others. A sample size of 400 respondents were selected and administered the questionnaire, but only 394 respondents returned their questionnaire. Three sampling techniques were employed for the study. Firstly, stratified sampling technique was used to stratify the study area into eleven residential areas. Secondly, systematic random sampling was used to select five streets from each residential area bringing the total to 55 streets. One street out of every five streets was selected and one house out of every ten houses on the street was selected for questionnaire administration. Purposive sampling technique was used in questionnaire administration due to variation in water need for livelihood activities in the study area. The data collected for the study was analysed using factor analysis because of its ability to reduce large variables to manageable factors. Using factor analysis based on Kaiser Principle, three factors were extracted using the variable maximisation method with Eigenvalue of 7.60, and percentage contributory variance of 91.8%. These water need to supply factors include urbanisation (.873), absence of storage facilities (.800), poor maintenance of water infrastructures (.682), vandalism (.800), misappropriation of water fund (.940), aging water infrastructures (.770), rapid population growth (.906), and limited capital (.547). The study revealed a positive relationship between the factors and shows the extent to which these factors strongly influence water need to supply in Makurdi urban area. The study further revealed that urbanisation, rapid population growth and misappropriation of water funds influence water need to supply the most in the study area. The study recommend that water board should uphold ethical standards in utilising funds meant for water project in order to supply water that meet the residents daily need for livelihood activities.

**Keywords: Water need to supply factors, Livelihood Activities, Makurdi urban area, Benue State.**

## **1.0 INTRODUCTION**

Clean, safe drinking water is scarce worldwide. 663 million people lack access to safe water although there is regional variation. The population without access to safe drinking water are mainly in sub-saharan Africa and Asia accounting for 84.33% of the total 663 million people. 319 million people (51.88%) are in sub-saharan African while 260 million people (39.22%) are in Asia (WHO/, JMP, 2015). Matter (1984) have recognised that water supply has been a primary logistical challenge since the beginning of civilization and balancing water demand and supply has been a major concern of human society at all times. The objective of water supply is the provision of portable water on a constant basis which addresses security of supply across seasons, and between wet and dry years, and is also imperative if health and wider poverty mitigation benefits are to be met and sustained (Getis, et al, 2008; Nwankwoala, 2011; Obeta and Chukwu, 2013). Provision of safe drinking water in urban areas of Africa and Asia is a major challenge. Urban water supply is influenced by factors such as poor coordination, poor maintenance culture, poor technical institutional structure , multiple programs, lack of data for planning, overbearing bureaucratic control by various supervising ministries, lack of professional inputs in projects, lack of community participation, inadequate funding, irregular disbursements of subventions, inappropriate infrastructure lack of clear policy direction, as well as lack of focus in terms of goals and objectives which resulted in the country's inability to achieve full coverage of urban population with safe water supply (Obeta and Nwankwo, 2015).

A fundamental shift from centralised ownership of water supply systems to local ownership and control has been experienced over the past decades (Harvey and Reed, 2003). Along with the shift comes a deviation from “supply- driven approaches to demand based approaches”. The transition follows the market place economic principles: people pay for the upkeep of valued items while unvalued commodities are not paid for (Obeta and Nwankwo, 2015). However, despite the widespread application of community management of urban water supplies in sub-saharan Africa, the sustainability of such programs remains unsatisfactory(Harvey and Reed, 2007). Dewilde et al (2008) opined that the deep reliability of water systems and the capacity of communities to maintain and manage the systems need to be evaluated before you can make judgement on the effectiveness of safe water programs.

Although the millennium Development Goals (MDGs) target of reducing by half the population not having access to safe water supply have been achieved, figures are still high in Nigeria (WHO/UNICEF JMP,2015). For instance, Obeta and Chukwu (2013) suggested that institutional reform, network rehabilitation, improved tariff, support by local government authorities, human resource development, use of simple technology, setting up water development commission among other factors are key actions to improve the water supply in urban areas.

## **2.0 STUDY AREA**

Makurdi town is the capital of Benue State, North-Central Nigeria. It is a town occupying the South and the North banks of the River Benue. The North and South divides of the town are connected by two bridges: the railway bridge and the dual carriage bridge. The town is located at the North Eastern part of Benue State and lies between Lat. 7°45'5°N and Long. 8°32'10'E and is located within the flood plain of the lower River Benue Valley. It has a spatial landmass of approximately eight hundred and thirty-six (836.km<sup>2</sup>) square kilometres (National Bureau of Statistics, 2007). The town is bounded by Guma Local Government Area to the North,

Nasarawa State to the North-West, Tarka Local Government Area and Gboko Local Government Area to the East, Gwer-East local Government Area in the South-East as well as Gwer-West Local Government Area to the South-West (Fig.1.1). It is situated in the Benue Valley on the Bank of River Benue. The inhabitants of Makurdi Urban Area are mostly the Tiv speaking people who are the most dominant ethnic group in the state. There are also the Idomas, Igedes, Etulos and other ethnic groups such as the Hausas, Nupe, Jukun, Igala, Igbo who are long time settlers and constitute a very significant number of the general population. The type of settlement pattern in Makurdi Urban Area is nucleated urban settlement where lots of buildings are grouped in a low land area. The buildings are clustered into neighbourhoods' which may be influenced by history of geographical factors such as defence, water supply, flatness of the terrain and fertility of the soil for agricultural purposes. The commonest housing types are zinc roofed houses with earth brick walls.



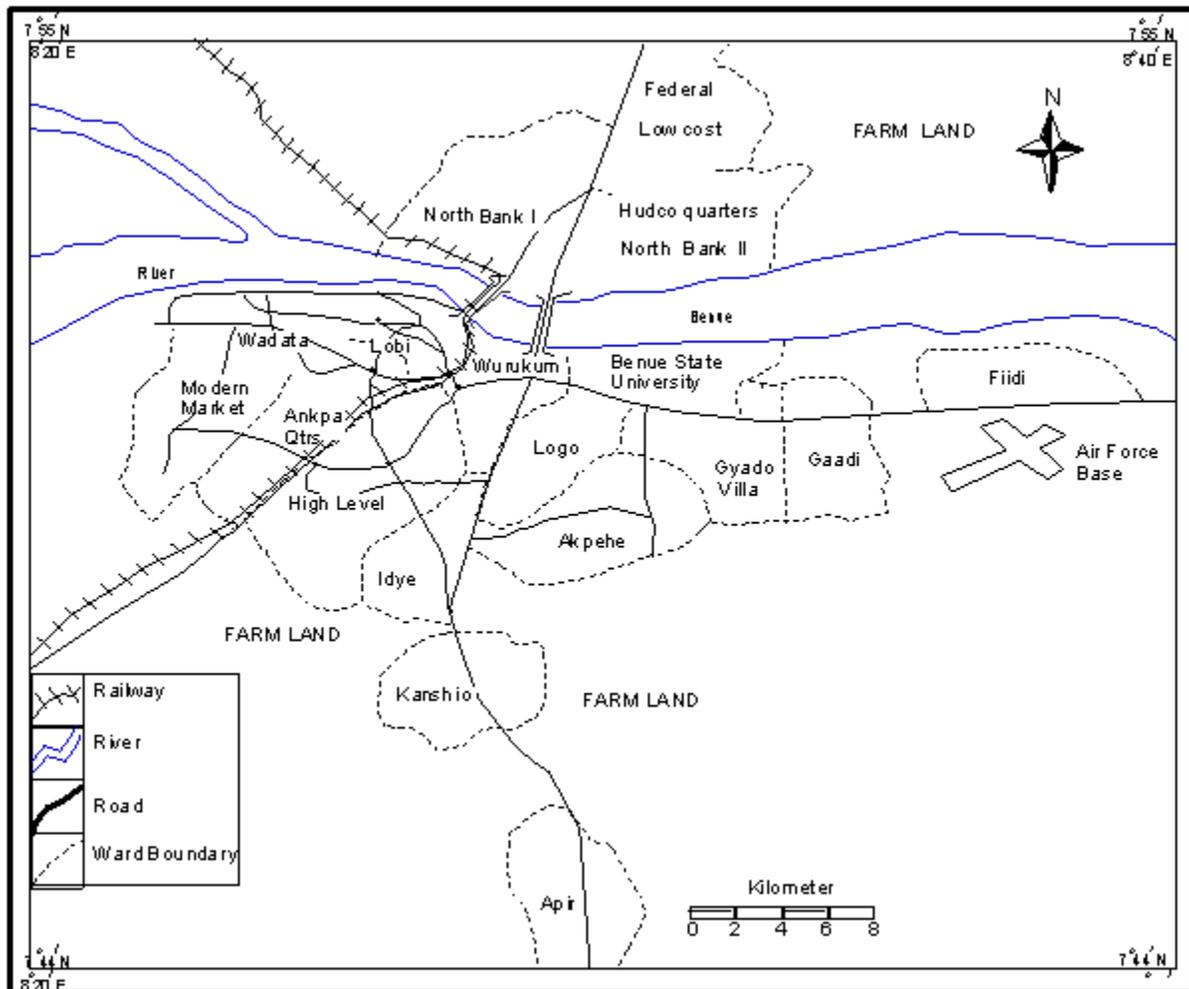


Figure 1.1: Map of Makurdi Town Showing Residential Areas.  
Source: Ministry of Lands and Survey, Makurdi

### 3.0 MATERIAL AND METHOD

Data on factors influencing water need to supply for livelihood activities in Makurdi Urban Area were collected using sample size of 400 respondents out of which 394 respondents returned their questionnaire. Three sampling techniques were employed for the study. First, stratified sampling technique was used to stratify the study area into eleven residential areas. Secondly, systematic random sampling was used to select five streets from each residential area bringing the total to fifty-five (55) streets. One street out of every five streets was selected and one house out of every ten houses on the street was selected for questionnaire administration. Purpose sampling technique was used in questionnaire administration and the choice of purposive sampling

technique was due to variations in quantity of water needs for livelihood activities in the study area. The parameters were defined as follows:

X1 = Urbanisation

X2 = Geographical influence

X3 = Absence of storage facilities

X4 = Ownership of water facilities

X5 = Vandalism

X6 = Poor maintenance

X7 = Tradition & culture

X8 = Misappropriation of water fund

X9 = Aging water infrastructure

X10 = Limited capital

X11 = Politicising of water project

X12 = Lack of political will

X13 = Non protection of water sources

X14 = Rapid population growth

Variables X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, were measured through the use of questionnaire. Factor analysis was used in summarising and analysing the data; as well as identifying the principal dimensions of the selected variables responsible for water need to supply for livelihood activities in the study area to identify their relative

contributions in influencing water need to supply for livelihood activities in Makurdi Urban Area. The factor analysis generated both the correlation matrix and the rotated factor matrix, in which only factors with Eigen values above unity with 5% or more explanatory powers were considered as separate orthogonal dimensions or factor components (Anyadike, 2009).

#### 4.0 RESULT AND DISCUSSION

##### 4.1 Factors Influencing Water Need to Supply for Livelihood Activities in Makurdi Urban Area.

There is a significant positive correlation between the variables. However, no particular pattern can be deduced from this relationship and these were resolved through the use of factor analysis. On the basis of the Kaiser Principle, three factors were extracted using only variables with a coefficient of  $\pm .50$  and above are considered significant (at 0.5 confidence level). These factors produced a number of significant variables (in parenthesis) that define the factors influencing water need to supply for livelihood activities in Makurdi Urban Area. The result shows that the factors offer a significant contributory explanation of 91.8%, leaving just 8.2% unexplained which could be due to non-water need to supply factors.

**Table 1: Factor Matrix of Water Need and Supply for Livelihood Activities in the Study Area.**

Variables	Water Need and Supply factors		
	I	II	III
Urbanization	.873	-.235	.305
Geographical influence	.812	-.385	-.262
Absence of storage facilities	.800	.502	-.165
Ownership of water facilities	.853	-.340	.209
Vandalism	.800	.496	-.165

Poor maintenance	.661	.682	.124
Tradition & culture	-.182	-.015	.208
Misappropriation of water fund	.840	.403	.940
Aging water infrastructure	.770	.559	-.137
Limited capital	.779	.547	.135
Politicizing of water project	.707	.631	-.120
Lack of political will	.624	.717	-.115
Non protection of water sources	-.341	.814	-.127
Rapid population growth	-.298	.906	-.120
Eigen-Value	7.580	6.829	2.122
% Variance	42.113	37.937	11.791
% Cumulative explained	42.113	80.050	91.84

**Source: SPSS Output 20.0.**

Table 1, shows the rotated factor matrix for the entire Makurdi urban area, with three factors that cumulatively explained 91.84% of the population variance. Factor one (1) which has an Eigen value of 7.580 accounts for 42.113 percent of the total variance. It has high positive loadings on variables 1(urbanization), 2 (geographical factors), 3 (absence of water storage facilities), 4 (ownership of water facilities), 5 (vandalism of water facilities), 6(poor maintenance), 8 (misappropriation of water fund), 9 (aging water infrastructure), 10 (limited capital), 11(politicizing of water project) and 12 (lack of political will). Factor one (1) also has negative loadings on variables 7 (tradition and culture), 13 (non-protection of water sources) and 15(rapid population growth). Based on the loadings of it variables, this factor can be described as urbanization factor. Factor II has an Eigen-value of 6.829 and explains 37.937 percent of the total variance. This factor has significant loading on variable 3(absence of water storage

facilities, 5(vandalism of water facilities), 6(poor maintenance), 8(misappropriation of water fund), 9(aging water infrastructure), 10(limited capital), 11(politicizing of water project), 12(lack of political will), 13(non-protection of water sources), 14(rapid population growth) and negative loadings on variable 1(urbanization), 2(geographical influence), 4(ownership of water facilities), 7(tradition& culture). The absence of these variables within Makurdi urban area could influence water need and supply for livelihood activities. The underlying factor here can be described as population growth factor. Factor III, has an Eigen-value of 2.122 and explains 11.791 percent of the total variance. This factor has positive loading on variables 1(urbanization), 4(ownership of water facilities), 6(poor maintenance of water facilities), 7(tradition and culture), 8(misappropriation of water fund), 10(limited capital) and 14(rapid population growth). Factor III also has negative loading on variables 2(geographical influence), 3(absence of storage facilities), 5(vandalism), 9(aging water infrastructures), 11(politicizing of water project), 12(lack of political will), 13(non-protection of water sources) and 15(rapid population growth). The absence of these variables within the study area could influence water need and supply for livelihood activities. The underlying factor here is misappropriation of water fund factor.

## **5.0 CONCLUSION**

This study has assessed the factors that influence water need to supply for livelihood activities in Makurdi urban area. The study revealed that much of the water need to supply factors in the study area owe much to rapid population growth, vandalization of water infrastructures, misappropriation of water fund, aging water infrastructure, limited capital, urbanization, poor maintenance, lack of political will and politicizing of water project. This is obvious as such factors will influence water needed for livelihood activities in the study area. The study, therefore, recommends that the water board should uphold ethical standards in utilizing funds meant for water project in order to supply water that meet the residents daily need for livelihood activities. To solve the problem of water supply shortage due to rapid population growth, the

board need to expand its water supply infrastructure and replace obsolete facilities in order to increase daily water needed for livelihood activities in the study area.

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