

Water Poverty Index: An Apparatus for Integrated Water Management in Nigeria

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ABSTRACT: Water scarcity and sanitation have constituted a major problem to the Nigerian government, this is because only 40 percent of the Nigerian population has access to potable water and over one hundred thousand children die yearly due to poor sanitation. This study evaluates the Water Poverty Index (WPI) that was designed by Caroline Sullivan for the monitoring and accessing of water at the international, regional and local levels. The study relies on secondary source for data gathering. This paper analyses the use of the WPI in five local government areas of Oyo state which indicated that the five local government areas are water-stressed regions because of the poor results in the WPI findings. It is on this ground that the study calls on the government to use the WPI for the monitoring of water availability so that adequate water policy can be initiated for proper integrated water management to address the problem of water scarcity. Finally, the study calls for future research on the WPI through an iterative process.

KEYWORDS: Composite Approach, Poverty, Water, Water Poverty Index, Water Resources.

1 INTRODUCTION

Nigeria with a population of 160 million people is facing water scarcity and poor sanitation. These problems have remained a daunting task for the government, stakeholders and development agencies despite Nigeria's endowed natural resources. Water is known to be an indispensable feature for human beings, without water there can be no life. According to Sullivan water is necessary for the existence of human beings and inadequate water can hinder human and economic development (Sullivan 2002:1). Roy and Crow (2004) assert that "water is essential to life, a basic requirement for the proper functioning of the global system. Lack of access to safe water has severe consequences for people's health and livelihood. Water is necessary for the people to live free of destitution, deprivation, and scarcity." The Nigerian Federal Government and State Governments have been trying in making water accessible to Nigerians, but their efforts have not yielded any positive impact, this assumption was corroborated by the chief water sanitation and hygiene section officer for the United Nations Children's Fund (UNICEF) in Nigeria who stresses that about 192,000 Nigerian children under five years died as a result of poor sanitation and water scarcity yearly. Gleick, (1999); Neto and Tropp, (2000) assert that exactly three million people don't not have access to proper sanitation system. Water scarcity can affect the health of communities and can potentially be a pandemic if efforts are not put in place to check water shortages. Water constitutes part of body weight, the brain 95 percent of water, the blood 82 percent and the lung 90 percent and without water in the body it can lead to death within days. It is a well-known fact that water acts as body lubricant and it regulates body temperature.

The economic impact of poor sanitation and hygiene is considered to be enormous in Nigeria, an economic study that was done to ascertain the economic impact of water and sanitation showed that poor sanitation and hygiene cost the economy of Nigeria US\$ 2,978 million per year. The costs reflect the health effects associated with poor sanitation and water supply, the costs of treating these health problems, loss of productivity and time spent to access services. The costs did not include the environmental impact that is associated with poor sanitation. Evidence has shown that Nigeria cannot meet the target of the Millennium Development Goals for people to have access to water and sanitation by 2015 since a lot of people still lack access to these services. According to a survey compiled by the World Health Organization (WHO) and UNICEF Joint

Monitoring Program, the rate for Nigeria to meet the target is slow in as much meeting the target in 2015 is not feasible. Nigeria's national targets are 75% for sanitation and 65% of supply water.

With few years to the MDAs targets and there are not hope in sight for Nigeria to meet the 65% water supply, there is a need for integrated water management approach in monitoring the achievement of potable water at the local level, appropriate indicators are needed that allow measurement of progress of the water sector for each community to be made (Claudia 2006). In Nigeria, not many studies have been able to evaluate the importance of water for all as it relates to poverty. According to Sullivan without sufficient water supply vis a vis water poverty, any attempt to reduce income poverty will be difficult (Sullivan 2002). Although many indicators have been used for development purpose in Nigeria but water poverty index has not found its way to Nigeria in examining water poverty. It is on this account that this study will evaluate the importance of water poverty index and its usefulness in the Nigerian context. The Water Poverty Index (WPI) has been identified as a possible indicator for monitoring the progress at the local level as it paves the way for access to water in a wider water related context (Sullivan 2002). The index has been designed to identify and evaluate poverty in relation to water resource availability (Steven et al 2002).

2 REVIEW OF LITERATURE

Lack of water management poses a serious threat to human development which hinder welfare growth. As a result of this, there is a need for policy makers, stakeholders, international development agencies and the government to focus attention on how millions of poor people in developing countries can have access to potable water. It is on this note that a concrete effort has been made to develop indicators to solve water problem in developing countries (Falkenmark, 1986; Joint Monitoring Programm, 2000; Ohlsson, 2000; Feitelson and Chenoweth, 2002; Sullivan, 2002; Chaves and Alipaz, 2007). According to Garrga and Perez-Foguet (n.d.) for developing countries to meet the target on the Millennium Development Goals (MDGs) on water poverty reduction, there is a tendency to develop an apparatus for assessing the development process; informing and orienting policy-making; comparing situations and measuring performance. In a nutshell, efficient water tools need to concentrate on the obstacles to the accessibility of quality water supply in order to facilitate policy responses. With regard to the four objectives mentioned above intended at evaluating the lack of water and accessibility to water of poor people in the developing countries, the water-poverty nexus has been formulated to as a tool through the water poverty index (Sullivan 2002). The composite approach of the water poverty index has been tested and tried in Tanzania by Mlote et al. (2002). According to them, the composite approach "provides the basis for the now widely accepted Human Development Index and many others." However, the core obstacle of using the composite approach is that there are scenarios when statistics of various types has to be merged. Also, Alatisse and Rodiya (n.d.) use the composite approach of the WPI to calculate the state of water delivery and water poverty assessment in some local government areas of Ekiti State in Nigeria. From their findings, the Irepodun/Ifelodun local government area has an increased value of WPI. Therefore, it experiences the bottommost degree of water stress. On the contrary, the Ekiti East local government area has the lowermost value of WPI and therefore experiences the topmost degree of water stress. Olotu et al. (2009) evaluate the WPI in Ondo State of Nigeria, from their analysis after using the time analysis and composite approach along with the Human Development Index (HDI), the result of their research indicated that four local government areas have a moderate access to quality water and improved HDI. On the other hand, three other local government areas are the most-stressed water regions of Ondo State along with low HDI. In a similar vein, Ayeni and Soneye (2011) mapped the population and water poverty index of Akoko North-East communities in Nigeria, from their empirical findings, WPI in the study area is below half while access to income and sources of a quality water supply manifested in the water poor population features. (Lawrence et al. 2002; Komnenic, 2007; Heidecke, 2006; Sullivan et al. 2003; Cullis and O'Regan, 2004) all subscribed to the fact that the WPI looked attractive and its exactitude has been proven to be meaningful at the local, regional and national levels. However, the likes of (Feitelson and Chenoweth, 2002; Molle and Mollinga, 2003; Shah and van Koppen, 2006; Jimenez et al 2007; Komnenic, 2007) have picked holes in the weight assign to the WPI to the components of the water poverty index.

3 TOWARDS A THEORETICAL FRAMEWORK

The scarcity of water for domestic and industrial uses has prompted academic scholars such as (Ahmad, 2003; Cullis, 2005; Sullivan et al. 2002) to call for a comprehensive approached-base framework for water management especially in developing countries. It is with this background that the Water Poverty Index was developed by Caroline Suvillian to examine poverty in relation to water resources accessibility. According to Garrga and Perez-Foguet (n.d.) WPI:

"is an integrated assessment of water stress and scarcity, linking physical estimates of water availability and the socio-economic factors which impact on access and use of this resource. The purpose of a water

poverty index should thus be to identify the ability of countries or regions to address their water supply needs. In other words, it is hoped that the development of such an index will enable decision makers to target (at various levels) crosscutting issues in an integrated way, by identifying and tracking the physical, economic and social drivers which link water and poverty. The core theoretical framework of the index encompasses water resources, access to water, capacity for sustaining access, the use of water and the environmental factors which impacted on the ecology which water sustains."

In addition, the WPI is an apparatus for the concentration of water needs and a device by which water progress can be observed. At the same time, the WPI has been formulated in a way to assist the more than one billion people especially in developing countries that lack access to potable water. Furthermore, the WPI follows some easy processes in order to be useful to the local, regional and national levels. These processes include: it is easy to calculate; implantation process is cost effective; stand mostly on current statistics; a visible process and easy to understand (Komnenic et al. 2009; Sullivan and Meigh, 2007). The United Nations defined poverty as:

"a denial of choice and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go; not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individual, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environment, without access to clean water or sanitation" (United Nations 2011 cited in Awojobi 2014).

The United Nations make us understand that lack of access to potable water or sanitation also constitutes poverty. In the same vein, Sen, (1981, 1983, 1995) in his research analysis titled *In Development as a Freedom* encapsulates poverty as a "deprivation of basic capabilities" and not necessarily a lack of income. From Sen definition of poverty, deprivation of basic capabilities means individual not having the basic necessities of life for decent living. Desai, (1995) expatiates on Sen (1981, 1983, 1995) "deprivation of basic capabilities" by measuring poverty in terms of capabilities. According to him, "as far as the measurement of poverty is concerned, we are interested in guaranteeing that people have certain capabilities, i.e they have the resources required to function in any of the several alternative ways possible." Desai, (1995) classified five core capabilities that are indispensable to human beings for efficient livelihood. They include:

- (a) Capability to stay alive/enjoy prolonged life
- (b) Capability to ensure biological reproduction
- (c) Capability for healthy living
- (d) Capability for social interaction
- (e) Capability to have knowledge and freedom of expression and thought (Desai 1995 cited in Mlote et al. 2002).

Mlote et al. (2002) make us understand that the availability of sufficient water for domestic and productivity use can obviously be connected to the capabilities mention above. It is in this regard, that the WPI index has been designed to provide a comprehensive approach on how poverty may be reduced through more effective and equitable water management (ibid.).

4 POVERTY IN NIGERIA

Since the introduction of democratic governance in Nigeria on May 29, 1999. The poverty rate in Nigeria has continued to increase in geometrical progression. National Bureau of Statistics (NBS) released the Nigerian poverty profile in 2010. The data show that 112 million Nigerians live in relative poverty. This was corroborated by the United Nations representative in Nigeria when she said 100 million Nigerians live in destitution (Awojobi 2013 and 2014). In addition, the World Bank came up with its report on poverty in Nigeria in 2014. The report indicated that Nigeria is the third country in the world with a lot of poor people. The United Nations High Commission for Refugee (UNHCR) conceptualizes poverty as a condition of people lacking require resources, capabilities, choice, power and security which are prerequisite for good standard living (UNHCR 2004). "Poverty should not be limited to income alone" (Awojobi 2013). It is on this ground the Copenhagen Declaration of 1995 defined absolute poverty as "a condition characterized by severe deprivation of basic human needs, including food; safe drinking water; sanitation facilities; health; shelter; education and information" (Awojobi 2013). The Nigerian government has come to realize that one of the ways to reduce the high rate of poverty in the country is to formulate good water policy to meet the water need of the people.

4.1 WATER AND POVERTY NEXUS

Ending poverty in Nigeria begins with clean water. Apart from the issue of conflict, climate conditions and political crisis that are related to poverty in Africa. One prominent factor that has been neglected that has caused much poverty in Africa is potable water. According to the Water Project Organization, the lack of access to quality water makes it difficult for one to grow crops, stay healthy and cook good food. In many Nigerian communities, able-bodied men and women have to trek long distances in search of water. The United Nations stress that the countries in the Sub-Sahara Africa lose 40 billion hours annually searching for water. More than one billion inhabitants in developing countries do not have access to potable water (Pacific Institute, 2002). There is a possibility for the figure to increase (Barker et al. 2001) In most cases in local communities in Nigeria, water is fetched from the streams and this water is contaminated with waterborne diseases. The high rate of typhoid fever, dysentery and cholera in the country have been blamed on unclean water that is consumed by the populace. A crucial aspect of water poverty is the carrying of water on one's head. A case in point is that one needs to wake up in the morning in search of water. After getting the water, you need to carry the water on your head and trek for one or two hours. It is time wasting and in most cases the girls who are the ones carrying this water on their heads have to forego school on some days because they have used their precious time in searching for water and transporting this water to their domains. It is argued without clean water and water accessibility, ending extreme poverty will be a mirage. In Africa, the poor find it difficult to access potable water. For instance, in the villages in the nearby Nyando basin in Kenya, the high chief narrated that their main apprehension is "the availability of safe, reliable water supplies throughout the year" (Swallow, 2002). In Nigeria, 112 million people live in relative poverty according to the National Bureau of Statistics, so lack of income can prevent the poor from having access to adequate quality of water. Hence, the lack of water resources and the lack of income are fused together in an undesirable response that can keep the entire country in 'dynamic poverty trap' (Roy and Crow 2004).

4.2 THE IMPACT OF WATER ON DEVELOPMENT

Water is an indispensable feature of human beings and the lack of water may have various degrees of impact on the society. This section of the study unveils the importance of water on development in human society.

(a) Health

Health is wealth, a sick nation cannot develop its human potential to an optimal use. According to the waterpage.com someone can only stay alive after three to five days without water. Water is needed in the body to function properly. This is because the body organs such as the heart and kidney need water for continuous living. Depending on the climatic conditions, human beings need an approximately 1 and 5 liters of water in a day in their life (Molle and Mollinga 2003). The World Health Organization (WHO) stresses that lack of clean water can lead to the widespread of diseases such as malaria, cholera, typhoid, dysentery and diarrhea. Roy and Crow (2004) posit that "lack of access to safe drinking water and lack of proper sanitation systems lead to illness, suffering, and death from dehydration and waterborne illnesses. It is argued that access to potable water in Africa will lead to a healthier workforce vis a vis promoting economic growth and reducing poverty.

(b) Agriculture

According to Molle and Mollinga (2003) water is essential for food security, "this category of water use corresponds to individuals who need additional water to grow the food they consume (or part of it), or to carry out other activities on which their subsistence depends critically. The most common example is that of smallholders and peasants who irrigate their fields and who depend on this agricultural production for their food and subsistence." The report of the Human Development Index indicated that water is mainly used for agriculture in developing countries. An estimated 80% of Africans rely on agriculture for employment and water shortage will amount to food scarcity. Some of the arid regions in the continent are experiencing famines because of lack of rainfall to grow crops. The United Nations Economic Commission for Africa and the New Partnership for African Development posit that "irrigation is the key to achieving increased agricultural production that is important for economic development and for attaining food security."

5 WATER RESOURCES IN NIGERIA

Water is a fundamental feature for human beings, without water there can be no life. Water contributes to the establishment of settlements in any region. Nigeria with a population of 160 million people is blessed with water resources just as the country is also endowed with mineral resources. For political convenience, Nigeria is divided into the North and South geopolitical zones. Due to minimal rainfall in the north there is temporary and spatial variation in the availability of

water. Unlike the south that is close to the Atlantic ocean, has much rainfall in time and space, making the region endow with available water. According to the Nigerian National Water Policy of 2004, Nigeria is drained by the River Niger and River Benue. These two major rivers have a lot of tributaries to distribute water. Other important rivers in Nigeria are river Ogun, Osun Imo, Kaduan, Cross River and Gongola. Despite the abundance of water resources in Nigeria, it is only 40% of Nigerians that have access to potable water. The Multi-indicator Cluster survey that was carried out in 1999 by the Federal Office of Statistics (FOS) now the National Bureau of Statistics (NBS) indicated that only half of the urban population and 39% of rural inhabitants have access to potable water (National Water Policy 2004).

5.1 5.1 NIGERIAN NATIONAL WATER POLICY

Water accessibility is a major problem in Nigeria, despite the fact Nigeria is blessed with an abundance water resources. Only 53% of the urban dwellers and 38% of rural inhabitants have access to potable water. Lack of potable water for Nigerians which have led many Nigerians to seek solace in streams, rivers, puddles and well water. Most times, water from these sources have been contaminated by waterborne diseases. The importance of reducing poverty and increasing the well-beings of Nigerians through best use of water resources prompted the Nigerian government to come out with a National Water Policy (NWP) in 2004. According to the policy, the Millennium Development Goals (MDGs) and the New Partnership for African Development (NEPAD) objectives and the declaration of other international conferences on water formed the basic component of the National Water Policy. The guiding principles of the National Water Resources Policy include:

- The water policy shall be subject to and consistent with the Constitution in all matters including the determination of the public interest and the rights and obligations of all parties, public and private, with regards to water.
- All water, wherever it occurs in the water cycle, is a national asset and resource common to all, the use of which shall be subject to national control. All water shall have a consistent status in law, irrespective of where it occurs.
- The objective of managing the quantity, quality and reliability of the nation's water resources is to achieve optimum, long term, environmentally sustainable social and economic benefit for society from their use.
- There shall be no ownership of water but only a right (for environmental and basic human needs) or an authorisation for its use. Any authorisation to use water in terms of the water law shall not be in perpetuity.
- The planning and management of Nigeria's water resources shall take place within a framework which facilitates awareness and participation among all users at all levels (National Water Resources Policy 2004).

5.2 WATER RESOURCE MANAGEMENT

The Nigerian government knew the importance of water resources management, in this regard the basic component of water resources planning is to carry out water resource assessment of surface water, and underground water. According to the National Water Policy of 2004, the water resource assessment covers all river basins at the local and national level and the gathering of data on the value, capacity, nature, location and the ways of usage. The ability of the government to harness and develop Nigerian water resources made the government in 1979 to establish eleven River Basin Development Authority. They include the Benin-Owena Basin, the Lake Chad Basin, Upper Benue Basin, Sokoto-Rima Basin, Lower Benue Basin, Cross River Basin. Others are Oshun-Ogun Basin, Hadejia-Jama'are Bain, Anambra-Imo Basin, Niger-Delta Basin and the Niger Basin. According to Kumolu (2013), the river basins "were primarily established to provide water for irrigation and domestic water supply, improvement of navigation, hydro-electric power generation, recreation facilities and fisheries projects. The basins were also expected to engender big plantation farming and encourage the establishment of industrial complexes that could bring the private and public sectors in joint business partnership." These river basins have not lived up to the expectation of Nigeria because they have failed in all aspects in their statutory duty to supply water as needed by Nigerians. It is the failure of the river basins and the lack of potable water for more than half of the Nigerian population that this paper calls for the application of the water poverty index in the integrated water management in Nigeria.

6 APPLICATION OF THE WATER POVERTY INDEX (WPI) IN NIGERIA

The original idea of the water poverty index was conceptualized by Sullivan (2001 and 2002). The WPI is modelled as a comprehensive apparatus to encapsulate the connections between water availability and livelihood (Scoones, 1998 and Carney, 1998). The national population in Nigeria in 2000 puts the inhabitants in Nigeria to be 160 million and this has put pressure on the demand of water in the country. In a nutshell, the rising population has made the demand for water to overshadow its supply alongside the increasing development of major cities and the increasing living condition due to economic growth (NWP, 2004). Competing water uses, shortages of water, lack of water resources management and low level of irrigation potential are some of the difficulties confronting Nigeria as regard to water management (ibid.). It is

because of these problems that Sullivan (2001), Sullivan et al designed the WPI to assist both at the national and international level to halt water problems. The core aim of the WPI is to locate areas that are in need of water so that action can be taken to address the water problems in these areas. The formation and the component variables of the WPI were ascertained through the collective effort of water scientists, water managers and stakeholders which encapsulate a holistic idea of water management challenges (Sullivan et al. 2002, 2003; Sullivan and Meigh (2002). The five key components of WPI are:

- Resources - The physical availability of surface and ground water
- Access - The extent of access to water for human use
- Capacity - The effectiveness of people’s ability to manage water
- Use - The ways in which water is used for different purpose
- Environment - The need to allocate water for ecological services

Source: Sullivan 2001

6.1 COMPOSITE INDEX APPROACH

There is a threat to national water resources in Nigeria due to limited underground water obtainable in some major areas underlain by crystalline rocks. Furthermore, “poor watershed management, deteriorating water quality, drought and desertification are inexorably increasing water scarcity. Scarcity threatens urban and rural developments with rapidly rising water supply costs, reduced reliability of water supplies, prolonged droughts, flood and erosion and increasing costs of irrigated food production. Water related diseases are a major cause of morbidity and mortality, with malaria, diarrhoea, schistosomiasis, onchocerciasis and guinea worm all posing serious threats to public health” (NWP, 2004). The challenges pose to the nation’s water resources call for holistic water resource assessment on a specific basis at the national level and a water management tool which will be accessible to water policy makers at the various levels. In addition, the WPI has been developed by Sullivan which can provide policy makers in Nigeria the opportunity to prioritize expenditure in the water sector and monitor its progress. The composite index approach draws on the configuration and procedure used by the Human Development Index and it is based on the notion that a mixture of pertinent variables can provide a more holistic component of Resource, Access, Capacity, Use and the Environment (Mlote et al 2002). These five components are pulled together and added up to generate a comprehensive value for the Water Poverty Index (WPI). The arithmetical configuration on which the composite index version of the WPI is centered on is articulated as follows:

$$WPI_i = \frac{\sum_{i=1}^N w_{x,i} X_i}{\sum_{i=1}^N w_{x,i}}$$

Where WPI is the Water Poverty Index value for a specific region, and w is the weight added up to each of the components of Resources, Access, Capacity, Use and the Environment, having a value spanning between 0 and 100. The weight w is connected with each of the five components (X) on the Water Poverty Index formation, for that region, with X relating to the value of each of the components of the WPI. In order to standardize the result and produce a WPI value between 0 and 100, the sum needs to be divided by the sum of weights as demonstrated below:

$$WPI = \frac{wrR + waA + wcC + wuU + weE}{wr + wa + wc + wu + we}$$

6.2 APPLYING THE COMPOSITE APPROACH AT THE LOCAL LEVEL

Nigeria is a federal state that consists of the Federal, State and Local Government. The WPI can be used to assess water as it relates to poverty at the national, regional, state, local and the community level. For the purpose of this study, the composite index approach will be used to assess water availability at five local government areas in Oyo State of Nigeria. Oyo state is located in the South West of Nigeria and has a population of five million people according to the National Population Census in 2006. The five local government areas that the WPI will be calculated are Atisbo, Afijio, Itesiwaju, Iseyin and

Surelere. They are segregated of the integrated water resources fitness in the five local government areas due to the incongruity on hydrology, physical characteristics, economic and the environment. The purpose of calculating the WPI in the local areas is to compare the degree of water poverty in order for policy makers to formulate policy how to reduce the water poverty through water resource management.

Table 1. Component Score

Local Govt. Areas	Resources	Access	Capacity	Use	Environment	WPI
Atisbo	15.66	14.29	6.82	7.94	3.18	47.89
Afijio	10.17	9.67	4.71	7.57	0.89	33.90
Itesiwaju	2.72	2.27	4.27	1.56	0.02	11.29
Iseyin	9.13	4.26	2.68	2.29	0.50	18.86
Surelere	8.98	3.83	1.33	0.80	0.32	15.26

Source: Fabiyi and Ogunbode 2014

Table 2: Comparing the scores of these local government areas

Local Govt. Areas	WPI	Compare to the Safe Value	Compare to WPI Value of Nigeria (43.9<WPI<55.9)
Atisbo	47.89	Unsafe	Less
Afijio	33.90	Unsafe	Less
Itesiwaju	11.29	Unsafe	Less
Iseyin	18.86	Unsafe	Less
Surulere	15.26	Unsafe	Less

Source: Author's compilation 2014

Note: Water Resources Safe value is centered on the standard projected by Sullivan.

Safe: >62

Midding safe: 56<WPI<61.9

Low safe: 48<WPI<55.9

Unsafe: 35<WPI<47.9

The water poverty index of Nigeria (43.9) is based on the international comparison of 147 countries calculated by (Lawrence, Meigh and Sullivan, 2002). The WPI of the five local government areas was calculated by Fabiyi and Ogunbode (2014).

6.3 ANALYSIS

Table 1 shows the Water Poverty Index value calculated in five local government areas of Oyo State of Nigeria. From the data on the table, one can notice that the five local government areas have a very poor water situation when compared to the water resources safe value standard as projected by Sullivan of the Center of Ecology and Hydrology. Among the five local government areas, Atisbo has the highest WPI which is 47.98. This is followed by Afijio with 33.90. The WPI value for Itesiwaju, Iseyin and Surelere local government areas are 11.29, 18.86 and 15.26 respectively. A summary of the data implied that Atisbo have little water stress when compared with Itesiwaju that has the lowest WPI. Fabiyi and Ogunbode (2014) make us understand that Atisbo with the highest WPI is an agricultural town that has the British Tobacco Company (BTC) located in the town. The presence of this multinational company along with the commercial activities of agriculture and mining, and the construction of boreholes by the Bill Gate Foundation to prevent guinea worm infection make the Atisbo local government area to have a relative high WPI. Afijio that trails Afisbo behind in terms of WPI ranking in Oyo State is a town known for having many primary and secondary schools. Aside this, the town has a lot of civil servants and teachers which makes the town has a relative access to water. Surulere and Iseyin local government areas have very poor water availability. This is because they have a poor water resource base. For instance, the water component of the local government ranges from resource 8.98; access 3.83; capacity 1.33; water use 0.80 and environment 0.32. On the other hand, Iseyin local government area water component consists of resource 9.13; access 4.26; capacity 2.68; water use 2.29 and environment 0.50. Itesiwaju has the extremely low degree of WPI, which indicates that the town has an awfully poor water availability. This reflects in the water component of the local government area. The water component comprises of resource 2.72; access 2.72; capacity 4.27; water use 1.56 and environment 0.02.

Table 2 above shows the comparison of the WPI of these local government areas and the standard value projected by Sullivan as well as the WPI of Nigeria. From the data analysis, none of the WPI of these local government areas corresponded or appreciated over the standard value that was estimated by Sullivan. It is on this ground that all the five local government areas fall into the unsafe category of the WPI. Similarly, four of the local government areas, namely Afijio, Itesiwaju, Iseyin and Surulere fell short to Nigerian national WPI of 43.9. On the contrary, Atsibo local government area WPI (47.89) surpasses that of the national value of Nigeria. The information from the result revealed that the five local government areas are seriously facing water stress. Furthermore, the little access to quality water by these local government areas implies that the inhabitants of these areas will be prone to low productivity, poor income and the spread of waterborne diseases will be likely in these water stress areas. This calls for policymakers, stakeholders and the government to formulate good water policy to address the water problem not only in these five local government areas but the entire Nigeria. The WPI as an awesome tool that the Nigerian government can use to map out areas that have water stress so that the Federal Ministry of Water Resources can make these areas a priority for integrated water management. In addition, Peter Gleick the author of the 'The World's Water' stresses that if the water society concentrated on meeting the fundamental human right to water across the world, they "would have a useful tool for addressing one of the most fundamental failures of the 20th century development" (Gleick, 1999 cited in Roy and Crow, 2004).

7 CONCLUSION

This paper has expounded the interest in and importance of the use of the water poverty indicator as a successful water management apparatus in decision-making processes. One specific advantage of the indicator is that it has been tried and tested in some developing countries as it offers a basis for the now extensively accepted Human Development Index. Furthermore, the result of this study subscribed to the empirical analysis of Alatisse and Rodiya (n.d); Yahaya et al. 2009 who assert that the neighbouring states of Ondo and Ekiti that are close to Oyo state are water stressed. In a similar manner, this report consented to the findings of (Olhson, 1999; Lawrence et al. 2000 cited in Fabiyi and Ogunbode 2014) on the poor water situation in some West African countries. Finally, the empirical analysis of this study vis a vis the WPI value does not substantiate the result in the real analytical term. It is on this note that there will be a need for future research on the WPI through an iterative process. With this, a more comprehensive apparatus for integrated water management can be developed and adapted for use at various scales.

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