

## Public Perception of the Millennium Development Goals on Access to Safe Drinking Water in Cross River State, Nigeria

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### ABSTRACT

This study evaluated the public perception of Millennium Development Goals (MDGs) of environmental sustainability with focus on the MDG target which has do with reducing the proportion of people without access to safe drinking water in Cross River State, Nigeria. The stratified and systematic sampling techniques were adopted for the study, considering a study population of 2,892,988 with a sample size of 1260 respondents. The data was analysed using t-test analysis for single mean at .05 levels of significance. The result obtained from the Cronbach Alpha reliability of the instrument was .67, while the mean ( $\bar{x}$ ) and standard deviation were 20.98 and 3.73 respectively. The instrument measure what it was designed to measure in the study. The result showed a significant but positive t-value of 12.21. The calculated t-test of 12.2 was found to be significantly greater than the critical t-value obtained in the result; it implies that respondents have adequate perception of MDGs of environmental sustainability in terms of access to safe drinking water. The perception of MDGs of environmental sustainability was significantly high. It was recommended that environmental sustainability issues should be given priority and included in the school curriculum at all levels of education system. Secondly, the Cross River Government should embark on water schemes across the State to provide portable and affordable water in the State as it has done in Calabar Metropolis thereby meeting the MDG target, to halve, by 2015, the proportion of people without sustainable access to safe drinking water.

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## 1. INTRODUCTION

Water is a colourless, odourless and tasteless liquid which falls from the atmosphere as rain, found underground beneath the earth surface and also found in pools of mass as oceans, rivers, streams, lakes and creeks. It is a substance required by all forms of life on earth for survival. Water can also be presented in three states such as solid, liquid and gaseous states. Eze and Abua (2003) defined water supply as water that is available for use from various sources. It ranges from rain water harvesting, to large scale construction of reservoirs for the purpose of making water available to members of the public [1]. We have domestic water, industrial and irrigation water supply. Domestic water supply is seriously affected by population whereas industrial water supply is a function of technology and level of industrialization. Cities and towns like Lagos, Kano, Port Harcourt and Enugu have very high industrial water demand than towns like Ikom, Ogoja, Calabar, Uyo, Makurdi and Jalingo.

The importance of water to human beings cannot be over emphasized, it is appropriate the state that without water humans will definitely be unable to exist on earth. This is because of the cardinal importance of the commodity. Water is used for a wide variety of purposes such as drinking, bathing, washing, cleaning, cooking, irrigation, and so on. To Eni (1998) water is an essential component of life, domestically it is used for drinking, cooking, watering of gardens, among other primary functions [2]. To Eze and Abua (2003) water is the basis of life and therefore the development of water resources is an important component in the integrated development of an area [1]. According to Bisong (2001) water for use in the homes, industry and the hydro-electricity generation is obtained from the rural areas [3]. Availability of water in the form and quantity required has made it necessary for some industries to be located in the rural areas. Similarly, both plants and animals depend on water for survival.

It is also important to mention that nature has delineated water from land clearly. Water covers between 65 to 70 per cent of the earth surface. All animals require water, but species vary greatly in their need for drinking water. Water is needed for drinking and bathing. Some animals like Kobus Kob, water buck, bush buck and reedbuck drink a lot of water and are often found near a water pool [4]. Chiras (1994) stated that water covers about 70 per cent of the Earth's surface and comprising two-thirds or more of the weight of most animals and up to 95 per cent of the weight of plants [5]. Water, thus is indispensable to life. Despite its crucial role in our lives, water is one of the most badly abused resources. Water is one of the most important resources of the earth. It has a critical function in all spheres of life. Adequate water is needed for drinking, personal hygiene and other domestic purposes. It is needed for individual, public, commercial and agricultural purposes. The demand for water for these purposes has consequently led to a close relationship between water availability and economic development of a nation. Water resources are many and the purposes for their development are also many. On a global scale, there are seven major sources of water which include atmospheric water, surface water, ground water, refrigerated water, biological water and vegetation water [6].

From the foregoing, there is no thought that water is found everywhere, but the quality and quantity required for use by each individual varies from country to country, depending on the priority attached by their different government in making water available for use. For instance, in Great Britain, United States of America, Russia and other advance countries government makes provision for about 100 litres per day in line with the required standard. But in developing countries of Asia, and Sub-Saharan African, availability of water in terms of quality and quantity is estimated 30 litres is made available for individuals per day. Water is one of the most important resources of the earth. It has a critical function in all spheres of life. Adequate water is needed for drinking, personal hygiene and other domestic purposes. It is needed for individual, public, commercial and agricultural purposes. The demand for water for these purposes has consequently led to a close relationship between water availability and economic development of a nation. Water resources are many and the purposes for their development are also many [6].

The world is on track to meet the drinking water target, though many remain to be done in some regions. Accelerated and targeted efforts are needed to bring drinking water to all rural households. Safe water supply remains a challenge in many parts of the world [7]. Jimenez and Perez-Foguent (2010), noted that the UN water conference held in Mar del Plata, Argentina in 1977 proposed the period 1981- 1990 as the International Water Supply and Sanitation Decade, with the aim of delivering water – related services for 100 percent of the world's population [8]. Even though targets were not achieved, water and sanitation appeared for the first time as a top priority in the development agenda. The main concern was taken up once more during the last decade. The MDGs include a specific target to cut in half, by 2015 the proportion of people that lack access to water and sanitation services.

Water supply situation analysis as spelt out in the CR-SEEDS, (2005-2007) show that government is aware that contamination from many source poses a health challenge to those who depend on such water to meet their needs (drinking, bathing and cooking). Intake of contaminated water exposes users to water borne diseases like dysentery, typhoid, cholera, diarrhoea, etc. Government has established the Cross River Rural Water Supply and Sanitation Agency (RUWATSSA), which alongside other agencies like the United Nations Development Programme (UNDP), European Union (EU), World Bank, and Non-governmental organization (NGOs) are responsible for providing water in rural areas under the mini-hand pump water schemes. All local government council headquarters, urban and mini-urban centres are served through urban and semi urban water supply schemes. These urban water schemes combined have made it possible for government to supply or provide safe water to about 45 per cent of the population of the State.

In the last five decades in Cross River State, there were functional Water works stations located in some of the urban towns of Calabar, Ugep, Ikom, Ogoja and Obudu providing water to meet the water needs of citizens of these urban towns. As time passes by, this urban infrastructure gradually became deteriorated, obsolete and mal-functional due to lack of maintenance and funding. The water supply situation metamorphosed into completely different strategy such as the introduction of public standpipes bore holes,

hand pumps and hand dug wells which were grossly inadequate. Due to the inadequacy of these water facilities, there were long queues for water where these facilities are found. The problem affected the water and sanitation status of the State, as most households around White House Street, in Calabar South Local Government Area do not have functional water closet toilets. Consequently, residents around some of these neglected areas pass human excreta indiscriminately within the neighbourhood. While in the rural areas of Cross River State, they depend solely on polluted rain water, streams and rivers for their water needs. With regards to toilet facilities, the predominant toilet types are pit and bush systems.

A relatively high proportion of the population in Calabar Municipality enjoys portable pipe borne water round the clock, making it perhaps the only city in the country outside Abuja where such exist. This water scheme is currently being extended through the assistance of the World Bank and African Development Bank to cover some other key urban cities including Ogoja, Ikom, and Obudu and its environs. The government of Cross River State is looking at the future and evolving an emerging strong service driven economy in the state. He has identified strategic investments that will consolidate the branding of the state as a destination [9]. According to Etowa (2005) the Africa Development Bank (ADB) in October 1992 approved a loan package in the sum total of \$116 million to the Federal Government of Nigeria for onward lending to the Cross River State Government [10]. This loan was for the financing of the engineering components, that is physical development of water supply facilities at Ugep, Ediba, Usumutong, Mkpani, Ekori and Adim and the institutional development of the company.

In spite of all the assertions made about water and the daunting challenges associated with accessing good quality water, most people in Cross River State, Nigeria do not perceive the problem because in one way or the other they can meet their water needs. Secondly, they are not aware of the provisions of MDGs with regards to access to safe drinking water as a major variable for the study. It is against this background that this research seeks to evaluate the perception of MDGs of environmental sustainability in line with water availability and accessibility, water quality and quantity which are critical.

## 2. MATERIALS AND METHODS

The population of the study consists of all residents of Cross River State. The population according to National Population Commission (2009) is 2,892,988. Out of this population 1,471,967 were males while 1,421,021 were females [11]. The sampling technique adopted for this study is stratified systematic sampling and the criteria for stratification were the senatorial districts. The whole of Cross River State was stratified based on the senatorial districts and three LGAs were randomly selected from each senatorial district. Three LGAs from each stratum were selected randomly using the random table.

In the southern senatorial district, three LGAs, namely Calabar Municipality, Odukpani and Akamkpa were randomly selected. In the Central senatorial district, three LGAs were selected namely Ikom, Etung, and Boki. In the Northern senatorial district, three LGAs namely Obudu, Bekwarra and Yala were randomly selected for this study. In order to select the subject of the study seventy (70) houses were selected in each LGA, every fifth house was systematically chosen and two members of the house hold who can read and write between the ages of 18-75 were given the questionnaire to respond to.

## 3. SAMPLE

One hundred and forty (140) subjects were selected in each LGA. Two council wards were equally selected from each LGA. This was systematically done in the nine (9) LGAs selected for the sample. The sample size for the study was made up of one thousand two hundred and sixty (1260). One hundred and forty (140) respondents were drawn from each LGA. Two "Yes" were written on a pieces of paper and the others "No". And those who picked the "Yes" automatically were chosen as subjects for the study. Stratified sampling is generally regarded as being more scientific, rigorous and advanced than random sampling. The sample for the study was made up of One thousand two hundred and sixty (1260) respondents. The population of the LGA selected was one million two hundred and seventy one thousand, four hundred and twenty-eight (1,271,428) inhabitants. Seven hundred and eight (708) respondents were males representing 56 per cent while Five hundred and fifty two (552) respondents were females representing 44 per cent. A breakdown of the distribution of sample is shown in Table 1 and 2.

Table 1. Distribution of criteria for sample

S/N	Senatorial districts in CRS	LGA. in CRS	LGA Sampled/Selected
1	1.Southern Senatorial District	Calabar Municipality Calabar South Odukpani Akpabouyo Akamkpa Bakassi Biase	Calabar Municipality Odukpani Akamkpa
	2.Central Senatorial District	Yakurr Obubra Ikom Abi Etung Boki	Ikom Etung Boki
	3. Northern Senatorial District	Obudu Bekwarra Obanliku Ogoja Yala	Obudu Ogoja Yala
Total	Three (3)	Eighteen (18)	Nine (9)

Table 2. Distribution of study sample by Local Government Area/ strata

N/S	LGA/Strata	No. of Person Selected in each House	No. of Houses Selected in each LGA.	No. of Person Sampled in Each LGA.
1	Calabar Municipality	2	70	140
2	Odukpani	2	70	140
3	Akamkpa	2	70	140
4	Ikom	2	70	140
5	Etung	2	70	140
6	Boki	2	70	140
7	Obudu	2	70	140
8	Bekwarra	2	70	140
9	Yala	2	70	140
	Total		630	1260

#### 4. INSTRUMENTATION

In order to obtain relevant data for the study, a Perception of Millennium Development Goals of Environmental Sustainability (PMDGESQ) questionnaire was designed to obtain information from respondents. The questionnaire was divided into two sections. Section A dealt with demographic data such as, Local Government Area and Gender while section B contained eight (8) items for each variable to elicit responses on the millennium development goals in terms of access to safe drinking water. The questionnaire adopted the 4-point Likert scale format which is suitable for this study. The Likert type Scale format interpretation key is given as: Vo-Very often, O – Often, R – Rarely, Vr- Very rarely. The items are represented thus: item 1-8 measured Millennium Development Goals of Environmental Sustainability in terms of Access to safe Drinking Water. The instrument was developed bearing in mind the targets and indicators of Millennium development goal 7c.

In order to establish the reliability of the instrument using an equivalent group, reliability is the consistency with which an instrument measures what it is supposed to measure after repeated measurement. The reliability of the instrument was done using Cronbach Alpha reliability in order to determine the reliability of the research instrument (PMDGESQ). Fifty copies of the instrument were distributed to respondents within Akpabuyo Local Government Area. The respondents did not form part of the final sample. After administration, the data collected were analyzed using Cronbach Alpha reliability estimate using sub-variable (N=50) and the result obtained was .67. This was used so as to find the internal consistency of the research instrument. The result obtained from the Cronbach Alpha reliability of the instrument (PMDGESQ) was .67, while the mean ( $\bar{x}$ ) and standard deviation (SD) were 20.98 and 3.73 respectively. This showed that the instrument was appropriate enough to measure what it was designed to measure in the study.

## 5. DATA PREPARATION AND SCORING

The questionnaire was divided into two parts: section A and B. Section A contains information on demographic data, such as Local Government Area and Gender. For the L.G.As, Calabar Municipality was coded = 1, Odukpani = 2, Akamkpa = 3, Ikom = 4, Etung = 5, Boki = 6, Obudu = 7, Bekwarra = 8, and Yala = 9, while the coding for Gender was as follows: Male = 1 and Female = 2. Section B was made up of 40 questionnaire items based on the variables identified for the study. The variable has 8 items measuring it. The 4 point Likert-type scale was used. These range from Very often, Often, Rarely and Very rarely.

## 6. RESULTS AND DISCUSSION

To test this hypothesis, the t-test was used to analyse the perception. The result is presented in Table 3. The result from Table 3 shows a significant but positive t-value of 12.21. The calculated t-value of 12.2 was found to be significantly greater than the critical t-value of 1.96 at .05 level of significant with 1259 degree of freedom. The positive t-value obtained in the result implied that, respondents have adequate perception of access to safe drinking water. The perception of the Millennium Development Goals of environmental sustainability was significantly adequate (high). Detailed explanation is presented in Table 4, item 1 to 8.

A breakdown of the analysis of the population t-test showed that there is significant positive t-value for bottles or sachet water used after meal, ( $t=17.05$ ;  $P>.05$ ); people using rivers and streams as a source of drinking water and house hold needs, ( $t=23.42$ ;  $P>.05$ ); natural spring water being used for domestic consumption, ( $t=6.13$ ;  $P>.05$ ); people using bore hole water for house clean up, ( $t=16.26$ ;  $P>.05$ ); rain water being polluted with dust and carbon dioxide, ( $t=7.05$ ;  $P>.05$ ); and significant negative t-values for pipe borne water available around your area, ( $t=-8.11$ ;  $P>.05$ ); people using poisonous chemical to harvest fishes from water bodies, ( $t=-13.09$ ;  $P>.05$ ); and human passing faeces into river and streams, ( $t=-2.16$ ;  $P>.05$ ). The null hypothesis was rejected for access to safe drinking water because the calculated t-values of 17.05, 23.42, 6.13, 16.26, 7.05, -8.11, -13.09, and -2.16 were found to be far greater than the critical t-value of 1.96 given .05 alpha level and with 1259 degrees of freedom. From the findings above, it shows that it is practically impossible for Cross River State to meet the MDG target to halve by 2015, the proportion of persons without sustainable access to safe drinking water.

Table 3. T-test analysis of the perception of MDG goal of environmental sustainability relating to access to safe drinking water (N=1260)

S/N	Item	Expected Mean	Observed Mean ( $\bar{x}$ )	Standard Deviation (SD)	t
	How often do you observe the following in the environment?				
1.	Bottle or sachet water used after meal.	2.5	2.96	.9	17.05
2.	People using rivers and streams as a Source of drinking water and household needs.	2.5	3.10	.92	23.42
3.	Natural spring water being use for domestic consumption.	2.5	2.68	1.05	6.13
4.	People using bore hole water for house clean up.	2.5	2.94	.95	16.26
5.	Pipe borne water available around your area.	2.5	2.23	1.17	-8.11
6.	Rain water being polluted with dust and carbon dioxide.	2.5	2.70	.99	7.05
7.	People using poisonous chemical to harvest fishes from bodies.	2.5	2.16	.91	-
8.	Human passing faeces into river and streams.	2.5	2.44	.99	-2.16
	Total	20	21.22	3.54	12.21

Significant at .05;  $df=1259$ ; critical  $t=1.96$

For the significant positive t-values, this finding means that the perception of the Millennium Development Goals of environmental sustainability in terms of access to safe drinking water with respect to bottle water used after meal, people using river and streams as a source of drinking water and house hold needs, natural spring water being use. For domestic consumption, people using bore hole water for house clean up and rain water being polluted with dust and carbon dioxide by literate Cross Riverian are perceived to be significantly high. However, the negative t-values implied that public perception of Millennium Development Goals of environmental sustainability in terms of access to safe drinking with respect to pipe borne water available around in the area, people using poisonous chemical to harvest fishes from water bodies, and human passing faeces into river and streams perceived by literate Cross Riverians as being

significantly low. The finding means that literate Cross Riverians have high perception of access to safe drinking water in terms of all the items.

The educational implication is that, teachers should be able to expose the children to a decent method of treating water before drinking. They should also be taught that rain water contains carbon emission substances that can affect the health status of human beings if it's not treated. Students who use river and stream as their source of drinking water should be taught on how to boil and filter water before drinking.

## 7. DISCUSSION OF FINDINGS

The results obtained from testing the hypothesis showed a significant but positive t-value of 12.21 and the calculated t-value of 1.96 at .05 levels of significance with 1259 degrees of freedom. From the result obtained, respondents have adequate perception of access to safe drinking water. The result also showed that, respondents have adequate perception of people using rivers and streams as a source of drinking water and also use this source for other household needs. The finding also showed that, respondents have adequate perception of natural spring water being used for domestic consumption. The finding was in line with Egborge (1998) who observed that, historically drinking of river water must be nearly as old as the creation of man although the first book of Moses reports the use of water for irrigation (see Genesis 2:10) [12]. The finding was also in line with Bisong (2001) who argued that rural drinking water sources come largely from surface streams and rivers [3]. This makes them susceptible to easy pollution and contamination from carelessly dumped wastes. Water from streams and rivers are contaminated by solid wastes such as excrements, agricultural waste and dead organisms. The finding was in consonance with Ekpoh (2002) who observed that natural water is not pure, technically, since it contains certain amount of dissolved substances with which it's come into contact [13]. Among the various sources of freshwater, river water has a relatively low degree of mineral content because the water entering the river from the catchment area flows through well-washed soil.

The study is in line with Ita (2010), who stated that, the city of Calabar enjoys portable pipe borne water round the clock, making it perhaps the only city in the country outside Abuja where such exist [14]. The study is also in line with Cunningham and Cunningham (2004), who observed that, worldwide, clean water is more available to urban people than to rural people, but access to good water is a major problem [15].

It was obvious from the result of the finding that respondents have access to water from various sources but they are unsafe for human consumption. This invariably means that, the MDG target to halve, by 2015 the proportion of persons without sustainably access to safe drinking water might not be met. The reason is because of the significant negative t-value obtained for item 7 which states how often you observe people using poisonous chemicals to harvest fishes from water bodies. Another reason why one can speculate that the MDG target might not be met is because of the significant negative t-value obtained for item 8 which state that how often you observe humans passing faeces into rivers and streams. From the aforementioned respondents people still use these unsafe sources of drinking water that are contaminated with poisonous chemicals, household waste, leaves and human faeces.

## 8. CONCLUSION

This study was aimed at evaluating the perception of millennium development goals of environmental sustainability in Cross River State, Nigeria. To attain this objectives one research hypothesis was formulated based on the sub-variable identified for the study. It was discovered that many household do not have access to safe drinking water. Therefore efforts should intensify in providing water to Cross Riverians. This is because water supply is the responsibility of government and the government should live up to its expectation of the people. Finally, government should make sure that water supply reaches the nook and cranny of the State and by so doing meet the MDG target, to halve, by 2015 the proportion of Cross Riverians without sustainable access to safe drinking water.

## 9. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made: Government and other development agencies should embark on water schemes across the state to provide portable and affordable water in the State as it has done in Calabar metropolis. This will reduce the consumption of rain water which is usually polluted with dust and carbon dioxide. Secondly, the obsolete water works and water supply infrastructure in Ugep, Ikom, Ogoja and Obudu should be rehabilitated and

revive and made functional, so as to provide portable water to other rural communities in Cross River State. Thirdly, there should be public enlightenment programmes on the risk of using poisonous chemical to harvest fish from water bodies and also the health hazard of passing human faeces into rivers and streams. Finally, there should be an awareness campaign on the health implications of passing faeces into rivers and streams.

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