

POTABLE WATER SUPPLY IN OWERRI METROPOLIS: A CHALLENGE TO MDGs ACHIEVEMENT

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Abstract

This research paper examined the readiness of the Imo State Government to deliver the MDGs by 2015 through potable water supply. A total of 400 questionnaires were distributed randomly to heads of households in the residential zone, 20 at the institutional areas, 20 to traders within the commercial zone and 5 respondents at the industrial layout respectively and supported with oral interviews. The results of the analysis were related directly to the affected MDG targets to reveal that the Otamiri Water Scheme that supplies water to Owerri urban is not functioning effectively. Also, the water distribution facilities are inadequate, overused and worn-out. They generally wear a poor state as evidenced from blockages, burst and rust pipes, and often flow of contaminated water which has odour and taste as indicated by the respondents. The impact is directly felt on the eight MDGs, cutting across gender equality in educational pursuit at the primary and secondary school levels, maternal and child health, mortality reduction, productivity and environmental sustainability and global partnership in sustainability of the built environment. On this basis the paper therefore, recommends that facility replacement, manpower improvement, adequate funding should be properly addressed. Also the use of leak detectors and improved water production technologies via International-Government partnership as well as public sensitisation should be encouraged.

Keywords: Potable water supply, Poverty, MDGs, Environmental sustainability, Ecological systems

Introduction

Water supply is necessary for the sustenance of life and ecological systems (Free Encyclopaedia, 2008). Water also is a very significant component in the overall development of a nation (Botkin and Kellers 2000). According to the United Nations Statistics, as many as 4 billion people ó two-third (2/3) of the global population lack access to safe, clean water (Arriens, 2009). It is as a result of the importance of water, and the problems which inadequate supply of water could cause to quality of life, that the international community has continued to make efforts to address its need. Notable efforts at the international level include:

- Proclamation of the international drinking water supply and sanitation decade 1981-1990 (World Health Organization, 1987).
- United Nations Expert Group Meeting of strategic approaches to fresh water management (United Nations, 1998).
- Millennium Development Goals Declaration on the halving of number of people who are unable to reach or to afford safe drinking water by 2015. The declaration also aims at discontinuing the unsustainable exploitation of water resources by developing water management strategies at the regional, national, and local levels that promote both equitable access and adequate supplies (United Nations 2001); and
- The international adoption of an "Action Plan for water" which commits all leaders of the world's wealthiest and most powerful nations to give assistance to poor nations that make political commitment to place safe drinking water and sanitation the top of their poverty eradication in sustainable development (United Nations, 2003).

At the national level, the Nigerian Government has made efforts over the years to address the problems of water supply and management. These include:

- Maintenance of water supply schemes under the regional government by 1950.
- Establishment of State Water Boards/Corporations from 1966 to date. Today, the water boards have been extended to all the 36 states of the Federation and FCT.
- Creation of the Ministry of Water Resources and the eleven River Basin Development Authorities (RBDAs), in 1976. These were charged with the management of water resources in Nigeria (NEST, 1991).
- The launching of the National Policy on Water Supply and Sanitation, to provide sufficient potable water and adequate sanitation to all Nigerians in an affordable and sustainable manner (Federal Government of Nigeria, 2000).

In 1976, when Imo State was created, the defunct Imo State Water Corporation inherited 45 water schemes from the East Central State Water Corporation with an average production capacity of barely 20 litres daily per person (Imo State Government, 2006). To address the problem of inadequate water supply at that time, a master plan for regional water schemes for seven urban areas was proposed. Amongst the seven urban areas, only three (Owerri, Okigwe and Orlu) are in the present Imo State. Of these three, only Owerri regional water scheme was successfully realized and commissioned. World Health Organization (1992) argued that users need to play an important role in the development, implementation, operation and maintenance of the facilities. Therefore, a proper maintenance management system of these water facilities is imperative if we must make significant achievement of the Millennium Development Goals. The paper intends to examine the water facilities in Owerri Urban and how they will help achieve the Millennium Development Goals.

Statement of Problem

David (2006) opined that if the quality and quantity of water distribution is harnessed, most of the MDG targets can be met. Unfortunately, the population of Owerri urban has continued to increase rapidly while the water supply in the area has remained grossly inadequate to meet the daily needs of the people. The scarcity of water has greatly affected the production activities in the area. Human services are being delayed. Despite the involvement of the Government, Non-Governmental Organisations and the private sector in water supply and sanitation projects, the quality and quantity of water supply has remained a problem to urban development. No significant attention has also been paid by the Imo State Water Corporation to complete the second phase of the water scheme and the pressure of demand for water resulting from this circumstance has been high. Consequently, there is that fear that the MDGs may be adversely affected if the water facility condition is not in good condition. It is observed that gross inadequacy of water supply is anchored on the maintenance status of these facilities. This paper seeks ways of harnessing the maintenance and management of the water facilities towards achieving the MDGs effectively in Owerri Urban.

Methodology

Study Area

Owerri urban lies on latitude 5.27°N and longitude 7.00°E and is located within the tropical climatic zone of Nigeria. The study area has a landmass of 130km^2 , lying at the junction of two rivers; River Nwaorie and River Otamiri. The population is 271,381 as recorded in the 2006 National Population Census result. The Owerri urban is presently a combination of three local government areas; Owerri North, Owerri West and Owerri Municipal. Its source of public water supply is Otamiri Water Board which is under the maintenance and management of the Imo State Water Corporation.

Sampling and Sampling Techniques

For proper sampling, the study area was divided into residential, commercial, institutional and industrial zones. The residential zone was stratified into 8 strata using the stratified sampling technique and 10 streets were selected from each of the 8 residential strata using simple random sampling technique. Each street has an average of 52 buildings that formed the sample frame and 5 heads of households were sampled from five buildings along each street using systematic sampling technique. A total of 50 heads of households were sampled from each street giving a total of 400 heads of households in the residential zone. The residential strata are World Bank Housing Area, Works Layout, Orji, Ikenegbu Layout, Prefab Housing Area, Aladinma Housing Area, Amakohia and Central Business District (CBD). The commercial zone comprises the Main market and Owerri Relief market. Samples of 20 traders were taken, 10 in each market using systematic random sampling technique. A total of 69 primary schools were identified in the study area comprising of 28 Government owned schools and 41 private schools. Out of these, 20 of them were randomly sampled. There are about 158 hospitals, clinics and maternity homes in the area. The Government owns 5 of them while the rest are privately owned. A sample

of 20 hospitals was taken at random. In this area, 21 industries were identified and 5 were sampled at random. All the individuals selected were sampled with a well-constructed questionnaire, which addressed the present and past conditions of water supply and water facilities in Owerri Urban. Two officials were interviewed at the Imo State Water Corporation. Data collected were analysed using percentages and frequencies and discussed in direct relationship with the affected MDGs.

Presentation and Interpretation of Data

TABLE 1: REASONS FOR WATER IRREGULARITY IN THE RESIDENTIAL NEIGHBOURHOODS STUDIED.

	WBHE	WORKS L/OUT	ORJI L/OUT	IKENGBU L/OUT	PREFAB H.E	ALADINMA H.E	AMAKOHA L/OUT	CBD	TOTAL	% DISTRIBUTION
Low pressure	29	-	-	-	14	-	-	-	43	10.75
Power breakdown	-	-	-	-	-	7	14	-	21	5.25
Pipe blockage	-	6	15	-	30	-	-	35	66	16.50
Pipe burst	13	14	26	32	-	42	14	8	149	37.25
Leakage	-	-	9	14	-	1	8	-	32	8.00
No response	8	30	-	4	6	-	14	7	69	17.25
Total	50	50	50	50	50	50	50	50	400	100

SOURCE: *Field Survey 2009*

Results on table 1 above show that pipe burst is the most common reason for the irregularity of water supply in the neighbourhood studied. However, pipe blockage (16.50%), low pressure (10.75%) and leakage (8.00%) were also identified as other reasons for water supply irregularities.

TABLE 2: WATER QUALITY IN THE RESIDENTIAL NEIGHBOURHOODS STUDIED.

	WBHE	WORKS LAYOUT	ORJI LAYOUT	IKENGBU LAYOUT	PREFAB H.E	ALADINMA H.E	AMAKOHA LAYOUT	CBD	TOTAL
Colourless	25	40	21	23	21	26	20	22	198
Tasteless	8	29	7	-	-	14	-	29	87
Odourless	7	29	7	-	-	-	-	-	43
Has Taste	-	-	7	50	-	30	-	21	108
Has Odour	-	-	-	36	-	-	7	-	43
Has Colour	7	21	14	50	36	7	41	14	190

SOURCE: *Field Survey 2009*

From table 2 above, it was found out that the quality of water is good in works layout, Aladinma Housing Estate and the CBD, while the water is bad in Ikenegbu Housing Estate, Prefab Housing Estate and Amakohia layout. However, 190 respondents indicated that the water has colour, 108 indicated that the water has taste. This shows that the water in most cases is not very safe for drinking.

TABLE 3: AVAILABILITY OF WATER IN PRIMARY AND SECONDARY SCHOOLS STUDIED

	NO OF RESPONDENTS	PERCENTAGE
Daily	5	25
Once in two days	5	25
Once in three days	4	20
Once weekly	2	10
Never	4	20
Total	20	100

SOURCE: *Field Survey 2009*

From the study, out of the 20 primary schools sampled as analysed on table 3 above, 20 percent indicated that they are not connected to the water mains so they have never had water (tap or borehole water). Only 25% of the schools have daily supply of water and all of them are private schools that have boreholes within the school compound.

TABLE 4: RATE OF WATER AVAILABILITY IN THE RESIDENTIAL NEIGHBOURHOODS STUDIED.

	WB-HE	WORKS L/OUT	ORJI L/OUT	IKENE-GBU L/OUT	PREFAB H.E	ALAD-INMA H.E	AMAK-OHIA L/OUT	CBD	TOTAL	% DISTRIBUTION
Daily	-	13	-	-	-	-	-	-	13	3.25
Twice weekly	13	12	14	-	-	14	14	10	77	19.25
Thrice weekly	15	15	-	30	-	26	22	25	133	33.25
Once a week	05	06	-	13	12	-	06	05	47	11.75
Rarely flows	14	02	06	7	18	08	-	-	55	13.75
No response	-	-	03	-	-	02	08	03	16	4.00
Total	50	50	50	50	50	50	50	50	400	100

SOURCE: *Field Survey 2009*

In all the layouts in table 4 above, only Works Layout has water daily while the availability of water in other neighbourhoods vary from once a week to thrice a week. This implies a significant level of inadequacy of the water supply in most residential neighbourhoods in Owerri urban.

TABLE 5: MAJOR WATER SOURCE IN THE HOSPITALS STUDIED

	NO OF RESPONDENTS	PERCENTAGE
Tap water	10	50
Borehole	4	20
Tap water & Borehole	6	30
Total	20	100

SOURCE: *Field Survey 2009*

In table 5 above, the major source of water in the hospitals is the pipe-borne water.

4. Discussion of Findings

GOAL 1: ERADICATE EXTREME POVERTY AND HUNGER

TARGET [1]: Halve between 1990 and 2015, the Proportion of People who Suffer from Hunger.

TARGET [2]: Achieve full and productive employment and decent work for all, including women and young people.

It was observed that water supply in Owerri Urban was irregular as seen on table 1. Many water factories were established within the study area and this has created a lot of employment opportunities for people that its constant supply can go a long way in alleviating abject poverty in the urban area. Poor immigrants, especially those from the rural areas easily get themselves engaged in production and retailing of bottled and sachet water in the urban areas. This group of urban poor sustain themselves with this water business. In circumstances where there is scarcity of water, this same group searches for water, which they sell to homes to earn a living. A number of them also engage in some informal activities where water serves as a raw material e.g. car washing, block moulding etc.

From the study carried out in Owerri Urban, it was revealed that water supply is irregular and most times unavailable. Based on the analysis on table 1; 37,25% of the respondents indicated that pipe burst was responsible for water shortage while 16,50% admitted that the cause was as a result of blockage of pipes. In some cases as revealed in table 2, the water may not be of very high quality. This is as a result of high pressure from the water works, which causes the old and faulty water pipes to burst. This affects the productivity of those engaged in water production and the income level of those selling water. Furthermore, updates on the MDGs by UNDP (2009) shows that 54.4% of Nigerians are poor. The poor state could be linked to irregular supply of water that is needed almost in every production activity. The irregularity has worsened the economic state as opined by

UNDPHDR (2008) who stated that the people spend above 3% of the income on water; a condition which the United Kingdom Authorities described as hardship.

During the rainy season, flood water often enters the water mains, changing the colour of the water supplied which invariably makes it unfit for drinking and other domestic uses. In addition, the pipes used in the supply of water to homes were observed to have worn out and need replacement. Some are made of asbestos materials, which are not very safe and can be injurious to health. It is therefore very important that the water facilities need to be maintained and managed properly for effective operations. In effect, those who make their living from the water business most often run out of water supply and wealthier ones now resort to opening boreholes at depths they can afford, irrespective of its suitability to health.

GOAL 2: ACHIEVE UNIVERSAL PRIMARY EDUCATION

TARGET 4: Ensure that by 2015, Children Everywhere, Boys and Girls Alike, will be Able to Complete a Full Course of Primary Schooling.

Achieving primary education is not just by providing physical structures and teachers that will teach the children; rather it entails the provision of a conducive and enabling environment for the children so that they can assimilate what they are taught. A situation where the children will have to search for water first thing in the morning before setting out for school is not an enabling environment. A circumstance where the children do not have adequate toilet facilities with clean water to flush and good water source in these schools give rise to unhygienic environment and exposes them to all kinds of illness. Result of the interviews conducted on the heads of both secondary and primary schools sampled shows that the female students suffer stigmatisation when they menstruate without water to cleanup the impurities on them. This reveals why the World Water Council (2008) emphasised that "Water is needed to be able to educate the children". Providing clean water and adequate sanitation in schools enables children, especially girls, to attend classes instead of having to walk far to fetch water. They need to have access to water to receive education.

GOAL 3: PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

Target: Eliminate Gender Disparity in Primary and Secondary Education Preferably by 2005, and at all Levels by 2015.

In many developing countries including Nigeria, ascribed roles for women and the female children in the homes have been a hindrance to their development and empowerment. Women and girls need water to carry out the domestic chores like cooking, washing and cleaning. From the analyses on table 4, the study reveals that, most times, water is not available and so they have to search for it. They spend valuable time and energy, which should have been invested in other enriching activities searching for water. This invariably affects women empowerment and development in education, business, politics, etc. In a family where there are limited financial resources, the male children are often sent to school while their female counterparts are denied education so that they can

attend to domestic chores. Gender and Water Organization (2006) corroborated this idea. In their research carried out in Egypt, they found out that traditional gender roles allotted few rights to women. Women rarely took part in activities outside the home and were fully occupied collecting water, looking after their children, and performing other household tasks. Women are responsible for providing their families with water for drinking, washing and for waste disposal. Igbozuruike (1983) and Ekop (1994) also observed that, at the household level, women and children are the first to suffer as they spend much time everyday in search of water when systems break down.

According to Arriens (2009), women are traditional providers of water and are most affected by lack of access. Some spend their lives as water carriers and do little else. UNICEF (2004) stated that children, mainly girls, are forced to walk long distances for safe water and are in effect barred from attending school. However, if the Millennium Development Goal of gender equality and women empowerment is to be achieved, water supply must be regular in homes and water facilities must be maintained. The time spent on domestic activities will also be reduced. From our study we observed that although the population of Owerri Urban increases rapidly, old facilities were found at the water treatment station, some of which no longer perform. It was reported in an interview that a total replacement of under-laid water pipes has not been done, and there is no modern way of detecting pipe leakages. The respondents attributed this to inadequate funding, poor land use management, vehicular immobility and lack of manpower to execute the job. This situation is feared to have been contributing to poor health condition of people sourcing water from these faulty pipes.

GOAL 4: REDUCE CHILD MORTALITY

TARGET 6: Reduce by Two-Thirds, between 1990 and 2015 the Under-Five Mortality Rate.

Cleanliness is synonymous to healthy living and a healthy nation is a wealthy nation. It is a fact that germs, bacteria, fungi and other microscopic organisms that are capable of attacking the health of human beings and animals thrive in a filthy and dirty environment. Children under five are mostly affected since they are capable of playing and eating anywhere. They are vulnerable to attack and infections if they are exposed to unhealthy environment. This may result to increase in mortality rate. Water is needed for drinking, cleaning, washing and proper sanitation of the environment. An area that is poorly serviced with water stand the danger of pollution and the health of people living in such areas is endangered. According to UNICEF (2004) and World Bank Report (2008), ãa child dies every 15 seconds from disease attributed to unsafe drinking water, deplorable sanitation and poor hygiene. World Water Forum for Updates (2006), Facebook.com (2009), Watercentric.org and WHO (2009) corroborate that as at 2002, one in six people world wide - 1.1 billion total - have no access to clean water and the crisis kills 5000 children daily. About 400 million of these are children. Unclean water spreads diseases such as cholera and infact, diarrhoea, which kills 5 million people per year, mainly children. The finding on table 2 corroborates the above opinion. The people in Owerri usually buy

water from boreholes owners and from water vendors. This situation is not very safe for children. The quality of water at their disposal cannot be guaranteed as well. It therefore means that the facilities must be properly maintained and safe water supply must be regular for child mortality rate to be reduced by 2015.

GOAL 5: IMPROVE MATERNAL HEALTH

Target 7: Reduce by Three Quarters between 1990 and 2015 the Maternal Mortality Ratio

Just like children, pregnant women need to live in a healthy and hygienic environment. This environment needs to have safe water supply to prevent the women from contacting diseases that will jeopardize the lives of their babies. They also need regular supply of portable water for drinking and other domestic uses. These women are not supposed to be exposed to such difficult task of searching for water and carrying heavy cans of water on their head for long distances. Sick pregnant and post-partum women are most likely to suffer psychologically from lack of sanitation and to pass diseases onto their children. Also, more than half of Africans suffer from water related diseases. World Bank Report (2008) has put the estimate of death related to water-borne-diseases at 1.8million worldwide with children and women being most vulnerable to the diseases. Furthermore, some of the hospitals where the pregnant women and their children receive medication are poorly serviced by water. From the study, the water output of Imo State Water Corporation is 880m³/hr. from January ó April 2009; water was pumped for 1.15 hrs per day on the average when there was power supply. This means that only 1012m³ (927670.04 litres) of water on the average was made available to the public per day. The per capita water production for the first four months of 2009 in Owerri Urban stood a 4 litres/person/day (Field survey, 2009) which is quite below the World Health Organization per capita water standard which is 250 litres a day (IRIN Report, 2006).

From the study as shown in table 5, more than 50% of the hospitals/clinics surveyed indicated that their major water source is tap water. However, we observe that the lack of water supply from the public mains contributes to the poor hygienic state of the clinics. About 20% of these hospitals depend solely on boreholes because the public water system cannot meet their needs. This is also the case in some of the industries sampled. All of them depend on their boreholes. The drilling of these boreholes is capital intensive and it increases cost of production and operation for both the hospitals and industries. It was also found out that 30% of the hospitals/clinics depend on both borehole and tap water is not clear and available. The poor maintenance of water facilities and epileptic power supply hinder, to a large extent, the volume of water supplied to homes, hospitals, schools, and industries. Unless these problems are addressed, there may not be any headway in improving maternity health.

GOAL 6: COMBAT HIV/AIDS, MALARIA, AND OTHER DISEASES

TARGET 10: Achieve by 2010, Universal Access to Treatment for HIV/AIDS for all those who need it.

TARGET 11: Have halted by 2015 and Begun to Reverse the Incidence of Malaria and other Major Diseases.

By 2015, the target date set for the MDGs achievement, well over 50% of the world's population will live in urban and peri-urban area; majority of them in developing countries. If the present trend continues, the vast majority of these people will be living without access to decent shelter, water and sanitation. Such living conditions could seriously inhibit the various strategies in place to meet the MDGs. A typical case in point can be found in strategies to take care of those affected by HIV/AIDS. Their effectiveness depends to a large extent, on safe and hygienic living condition (Halfani, 2004). Water-borne diseases can be reduced or completely prevented by regular supply of potable water and constant maintenance of water facilities. Disease outbreak can also be checked if the people have access to quality water. HIV/AIDS, malaria and other disease also cannot be combated effectively if safe water supply is not guaranteed.

GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY

TARGET 14: Halve by 2015 the Proportion of People without Sustainable Access to Drinking Water and Basic Sanitation.

The Chairman of the UNSGAB- U.N Secretary-General Advisory Board on Water and Sanitation in HDR (2009) said that "every dollar spent on water and sanitation is a dollar spent on at least five other MDGs". He also said that working towards water and sanitation solutions will increase progress in all other areas. UNDP Nigeria (2009) also observed that access to sanitation has attained a crisis point with only 31% being secured while access to potable water is slowly improving. The field survey holds similar view in the case of Owerri Urban. Water is needed to a large extent for environmental sustainability. To meet the target of halving by 2015 the proportion of people without access to safe drinking water and sanitation, sustainable water projects that will serve both the urban and rural areas should be put in place. The target of improving the lives of slum dwellers cannot be improved if there is lack of safe water supply in the slum areas. Urban renewal and slum upgrading practises cannot be effectively carried out without first of all addressing water supply.

Conclusion

Water is needed to a large extent for the sustenance of humans and most of their productive activities as contained in the Millennium Development Goals. However the non-potable state of water supply in public mains in Owerri has for long reached its crisis point with its resultant hardship on people. The road to the achievement of the Millennium Development Goals in Owerri Urban is yet far and may not be attained owing to the poor and inefficient state of water facilities to boost/ meet the current capacity and quality

required in Owerri urban. A lot of work needs to be carried out to meet the quality and capacity requirement of water in the area.

Recommendations

Based on the above findings, it is clear that there are chronic water problems in Owerri Urban resulting from poor maintenance and management of water facilities in Owerri Urban. These problems could be remedied if the following recommendations are considered.

- Development of a comprehensive water resources master plan for easy assessment.
- Recognition of catchment basins as the unit of analysis in water quality standards, maintenance and pollution control.
- Procurement of modern water plants to supplement the outdated plants that have been over stressed due to high increase in water demands.
- Involvement of the Ministry of Lands for due consideration in granting permission to any Agency that may embark on any activity on land especially along the water routes to avoid the destruction of laid underground facilities/utilities like water pipes which when destroyed could lead to shortage in the supply of water to some communities.
- Developing a detailed water distribution network plan by the Water Board Corporation so as to avoid its destruction during road construction.
- Provision of laid underground facilities/utilities like water pipes which if destroyed could lead to water shortage.
- Making legislations, regulations and standards for water supply and sanitation.
- Provision of adequate fund for proper operation-mobilization of workers, maintenance and management of water facilities and other logistics.
- Increasing the capacity of the Government and private sectors at the State and Local levels to provide and construct high quality hand-dug wells, boreholes and reservoirs to meet the water needs of the present population which has rapidly increased.
- Re-piping, replacement or repair of damaged pipe lines to ensure water purity.
- Re-orientation of the Water Corporation Workers and a well defined distribution of Labour, so as to ease the free flow of water.
- Installation of electronic leakage detectors along the network of water facility in Owerri urban for effective management of the water facility.
- Increasing the capacity of Local, State and Federal Governments to assist urban areas to obtain basic water supply facilities that those urban dwellers can maintain with private sector support.
- Recognition of the need to balance water uses, water allocation and water protection carefully through a regulatory system of the Water Board Management and a participatory approach.
- Monitoring the performance of the sector (water resource management) for sound policy adjustment and development.

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