Assessment of Water Supply Situation in Owo, Ondo State, Nigeria: Implications for the Attainment of the Millennium Development Goals.

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Abstract- Water is one of the most important factor in the development of a nation and until recently, this essential element of urban liveability-domestic water supply have not received the much needed attention it deserved in promoting good urban living. This paper therefore, examines water supply situation in Owo, Ondo State, Nigeria. Data were obtained from both primary and secondary sources through physical survey, observation, interview and questionnaires administered to targeted residents of the different quarters of the ancient town. The study reveals among others shortage of portable water as well as lack of attention to maintenance and sustainability. Moreover, majority of the respondents get their water supplies from unprotected source thereby making them vulnerable to water borne diseases. The study therefore recommends among others the conduct of awareness campaign to sensitize the local people, provision of good and safe drinking water as well as the repair/maintenance of the existing water facilities in order to achieve the target of the MDG.

Index Terms- Millennium Development Goals, Sanitation, Safe Drinking Water, Urban liveability

I. INTRODUCTION

Social services are of critical importance to the well-being of the people and the enhancement of socio-economic development of their various communities. One key critical social service is water. Right from the advent of human civilization, water spawned life of this planet and has since sustained it. Water possesses the powers of life and death, controlling the fate of everything from micro-organisms to man. This explains why the United Nations in November 1980 inaugurated its International Drinking Water Supply and Sanitation decade. This ambitious programme is premised on the fact that water resource development is integral to national economic and social development and that access to safe drinking water and facilities are basic human rights (Buell, 1984).

Water is the most common substance on earth and it contributes in several ways to the economic and social development of any society. The use of water in any place includes drinking, cooking, washing and general sanitation. Others include industrial usage, growing of crops in terms of irrigation and livestock keeping. It covers more than 70 percent of the earth surface. It fills the oceans, rivers, and lakes, and is in the ground and in the air we breathe. Water is everywhere regardless of language, culture or ethnicity, all human shares this basic need that is essential for survival.

Water is therefore one of the most important factor in development and until recently, the multiple benefits of this essential element of urban liveability- domestic water supply have not received the much needed attention it deserved in promoting good urban living.

It is generally acknowledged that Africa has the lowest total water supply coverage of any region in the world. The minimum water requirement per head for houses with modern conveniences according to WHO (Adaramola 1990) is about 115 litres. According to Kabbaj, (2004), total coverage of water supply in Africa is around 62 percent and sanitation coverage around 60 percent. It is estimated that currently about 300 million people in Africa do not have access to safe water supply. This situation is a major cause of diseases, as a high proportion of Africans suffers from one of six major water-related diseases. Particularly affected are women and children who travel long distances to fetch water and spend inordinate amounts of time and energy at the expense of family activities, education and other productive work.

The UNCH Habitat (1998) identified urban problems throughout the less developed countries to include environmental degradation, inadequate shelter, infrastructure, water supply, sewerage and employment. Estimates from the WHO indicates that 25 percent of all urban dwellers in developing world do not have access to safe water supplies and 50 per cent do not have an adequate sanitation. In addition, the UNDP World Bank water and sanitation programme indicate that by the year 2000 more than 600m million urban people will lack adequate sanitation and 450 million will lack safe drinking water (Urban Age, 1992).

In much of the world polluted water, improper waste disposal and poor water management cause serious public health problems. Some water related diseases such as malaria, cholera, typhoid and schistosomiasis harm or kill millions of people every year. According to Water org (2010) 443 million school days are lost each year to water-related illness. A child dies every eight seconds from contaminated water with total deaths record of over 5million people every year (Ushman, 2003). Overuse and pollution of water supplies are also taking a heavy toll on the natural environment and pose increasing risk for many species of life (Ifabiyi, 2000). Shortage of portable water supply for domestic use has become a perennial problem in many Nigerian towns and cities. In November 2001, it was reported that

polluted water supplies led to an outbreak of cholera in Kano, causing more than 600 deaths (African Discovery B.B.C., 2001). It was based on the above and other factors that world leaders made the following declaration during the Millennium Summit in 2000: "We must spare no effort to free all humanity and above all our children and grand children, from the threat of living on a planet spoilt by human activities and whose resources would no longer be sufficient for the need" (Ajayi, 2005). The Millenium Development Goals (MDGs) were formulated from the above declaration.

This paper therefore examines water supply situation in Owo, Ondo State, Nigeria and make recommendations in order to achieve the target of MDGs.

II. THE MILLENNIUM DEVELOPMENT GOALS

The World Water Council in 2005 declared that 1.1 billion people lack access to safe drinking water. 2.6 billion people lack adequate sanitation. 1.8 million people die every year from diarrhoea diseases, including 90% of children under 5, this situation is no longer bearable. Based on the above, the United Nations formulated the Millennium Development Goals, dedicated to reduce poverty and ensure sustainable development, the goals range from halving global poverty and hunger to protecting the environment, improving health and sanitation and tackling illiteracy and discrimination against women. The millennium Development Goals (MDGs) is therefore the end product of numerous United Nations Development conferences from the 1960s to 1990s.

In September 2000, the United Nations General Assembly representing 189 countries, unanimously adopted the Millennium Declaration. At the United National General Assembly request, the Secretary General and various UN agencies, as well as representatives of the World Bank, International Monetary Fund (IMF) and Organization for Economic Cooperation and Development (OECD), devised a plan for achieving the Millennium Declaration's objectives – resulting in 8 goals, 18 targets and 48 indicators known as the Millennium Development goals (MDGs).

The MDGs therefore are a set of time-bound and measurable goals and targets ranging from halving extreme poverty, increase access to safe drinking water, halting the spread of preventable diseases, environmental devastation and discrimination against women to providing access to basic education, all by the year 2015

In all there are 8 goals and 18 targets but of interest is goal number 7, target 10 of the Millennium Development Goal which is targeted toward***: "Halve, by 2015, the proportion of people without sustainable access to safe water and basic sanitation***". The year of reference for this goal is 1990. In order to meet the water supply and sanitation target, an additional 260,000 people per day up to 2015 should gain access to improved water sources and an additional 370,000 people should gain access to improved sanitation (WHO 2004).

III. NIGERIA GOVERNMENT AND THE MDGS

The Nigerian Government as part of the signatory of the declaration, set up the office of the special assistant on Millennium Development Goals in the presidency, and also included the objectives of the MDGs in the NEEDS (National Economic Empowered and Development Strategy) document, which essentially is the road map of the Federal Government socio-economic development of the Country.

As a foregoing to the above, the State Governments in Nigeria has also set up their own adapted document/policies as SEEDS (State Economic Empowerment and Development strategy) and the Local Government as expected to set up the LEEDS (Local Economic Empowerment and Development Strategy). Direct implication of the above policy thrust is that a lot of government investments will be channelled towards the implementation of the Millennium Development Goals through the NEEDS, SEEDS and LEEDS.

Despite various policies and blue prints as well as huge resources committed to water service delivery by government at all levels, potable water at all levels is still very scarce, there is now a palpable fear that the country may not meet the MDG goals for water. Different studies have established this inherent fear if the current trend of poor water supply is not improved upon. The 2006 WHO/UNICEF Joint Monitoring Programme report submitted that Nigeria like several other African countries may not meet the MGD goals for water and sanitation (WHO/UNICEF, 2006). This was also collaborated by the study conducted by the United Nations Development Programme (UNDP) report of 2006 which rated Nigeria as being off track towards achieving the MDG goal on water. The report also stated that Nigeria has a low human development water, sanitation and nutritional status and that with the current trend, the MDG goal on water target may not be reached, not in 2015 but in 2040 (UNDP, 2006).

IV. WATER SUPPLY SITUATION IN NIGERIA

Nigeria has a total surface area of 923.768km^2, with a land area of 910.770km^2 and a water area of 13,000km^2 (Ince et al, 2010). Nigeria is endowed with about 267 billion cubic metres of surface water and about 52 billion cubic metres of ground water annually (Ince et al, 2010). In the southern part of the country, rainfall is high, surface water and springs are often the most appropriate source of water while in the north, rainfall is low and aquifers are shallow. It is obvious from the above that the country is generously blessed with abundant surface and ground water. In spite of this level of endowment, national sector data indicates poor access of Nigerian to water and basic sanitation.

Nigeria has an estimated Total Actual Renewable Water Resources (TARWR) of 286.2km^3/year amounting to 1893m^3/year per capital (AQUASTAT FAO, 2010). According to the National Urban Water Sector Reform Project (NUWSRP) report of January 2004, it is estimated that about 50% of the urban and 20% of the semi-urban population have access to reliable water supply of drinking water from non traditional sources (Monday, 2004). The same report submits that the overall effective urban water supply coverage may be as low as

30% of the population due to poor maintenance and unreliability of supplies, with rural coverage being estimated at 35%.

The rapid population growth of urban centres in Nigeria has brought about disproportionate increases in urban water demand. Due to the present economic recession in the country, government agencies responsible for water supply are not able to meet this increased demand for water in most urban areas. This shortfall in water supplied by these agencies results in pipe borne water shortages. It is a common fact that water is the resources that define the limits of sustainable development and it has no substitute.

The Water Supply sector in Nigeria has come under increasing focus since independence, but particularly during the last 20 years when the country participated in the global efforts and initiatives aimed at addressing the problem of low access to safe water. Many entities are involved in water supply, including: Federal Ministry of Water Resources, State Water Agencies, River Basins Development Agencies, Local Governments, and external support agencies including UNICEF, UNDP, World Bank, DFID, Global 2000, WaterAid, Concern Universal, and ZONTA International. These institutions employ their own implementation strategies and involve individual communities and LGAs to varying degrees. Because of the inadequacy of the approach to maintenance adopted by these, about half of the pumps in the country are out of service at any one time.

The water situation for six cities in the country is shown on Table 1. From the Table it is obvious that despite the abundance of both underground and surface water in Nigeria, access to safe water is highly limited to urban dwellers.

Table 1: Main Sources of Drinking Water in selected cities in Nigeria: 2009

Urban Centre	Main sM Main of Water Sources							Total
	Borehole	Well	Stream	Public tap	In-house tap connection	Water vendor	Others	
Onitsha	87.8	5.6	0.0	0.5	1.0	5.1	0.0	100.0
Maiduguri	23.6	4.0	0.5	20.6	12.1	39.2	0.0	100.0
Katsina	10.1	26.5	4.8	30.2	7.9	20.6	0.0	100.0
Lokoja	26.8	30.6	6.0	1.6	8.2	25.7	1.1	100.0
Lagos	26.1	22.6	0.5	8.0	6.0	36.7	0.0	100.0
Port Harcourt	44.0	0.5	2.0	13.5	40.0	0.0	0.0	100.0
All cities	36.6	14.7	2.2	12.4	12.7	21.2	0.2	100.0

Sources: NISER, 2010

This is no doubt a great resource which should be harnessed to produce maximum benefit to the nation. In an attempt to maximize this potential, a number of agencies have been put in place for the management of water resources and provision of water services infrastructure in the country. At the Federal level, there is the Federal Ministry of Water Resources (FMWR) with mandate for development of overall policy and regulatory mechanism for water development and utilization. In the country, water supply is a state responsibility. Towards this end, state governments have created State Water Agencies (SWAs) – Water Boards and water Corporations – They have the responsibility of providing urban, semi-urban and in some cases, rural water supply; they develop and manage water supply facilities within respective states in accordance with established financial objectives. Each SWA is responsible to the State Government generally through the State Ministry of Water Resources (SMWR). The Nigerian Water Policy indicates that water should be regarded as an economic good as well as social services and encourages the autonomy of SWAs.

Paradoxically, irrespective of the abundant natural water resources, proliferation of water works in the country coupled with a robust policy that spells out strategies and attainable targets, the water situation in Nigeria could be best described as precarious. Over the years, improvement in domestic water supply has not been impressive. For instance, in 1990, 47% of Nigerians have access to improved water. This percentage improved slightly to 53% in 1990. Displaying similar growth rate, only 58% access was recorded in 2008 (WHO/UNICEF JMP, 2010). In rural areas, where the majority of Nigerians live, only 58% had access in 2008 (WHO/UNICEF JMP, 2010). In literature, piped water is often equated to safe water since improved sources could still contain some harmful substances (Sullivan *et al*, 2003). Therefore, access to piped water is regarded as a measure of access to safe water. It is pathetic to observe that access to piped water among Nigerians has decreased extensively from 14% in 1990 to 6% in 2008 (WHO/UNICEF JMP, 2010)

V. MATERIALS AND METHODOLOGY

5.1 Study Area

Owo, the headquarters of Owo Local Government area is situated 38 kilometres east of Akure, the capital city of Ondo State, 400 kilometres North East of Lagos, the commercial nerve centre of Nigeria and 480 kilometres South East of Abuja the Federal Capital Territory. Owo lies on latitude $7^{o}15'$ north of the Equator and longitude $5^{o}35'$ east of the Greenwich Meridian. It is about 150 metres above mean sea level. The core area covers an area of about 1,341 hectares (Adebiyi, 1996) with six main traditional quarters bounded by defense moat. The town has however grown far beyond the traditional moat and has incorporated many major landmarks in the process of its spatial expansion.

The town falls within the sub equatorial region characterized by a monsoon climate. The temperature is relatively high throughout the year with an average daily temperature of about 27°C, with marked seasonal changes in rainfall and relative humidity. Owo (situated in the south western part of Nigeria), like other tropical areas of Nigeria enjoys abundant rainfall of over 1,500 millimetres yearly (Aribigbola and Omosulu, 2002). Available records show that Owo had a population of 30,662 during the 1952/53 census year. The 1963 population census recorded population of 80,413 for the city. By the year 1991, the population of the town rose to 155,006 and her population was estimated to be 176, 955 in 1996 and in 2003, the population also rose to 203,381. The 2006 population census however put the population of the ancient town at 218,886 and using a growth rate of 2.5% the present population (2013) is estimated at 260,187.

5.2 Data Sources

The basic data set utilized for this paper was collected using a structured questionnaire administered on selected residents (household heads) of Owo to obtain information on their socio-economic status, sources of water supply, distance travelled in sourcing water, water treatment methods as well as the problem associated with getting water for their daily needs. Systematic random sampling technique was used to select buildings and residents at interval of every tenth building in the six main traditional quarters which the town was stratified. A total of 300 questionnaires were administered. Moreover, officials of water supply agency responsible for water administration and management in the study area were interviewed. Other relevant materials and data were sourced from published sources such as textbooks, journal articles, newspaper and internet among others.

VI. EXISTING SITUATION OF WATER SUPPLY AND SANITATION IN OWO

There is no city in Nigeria even in the world that can boast of efficient and effective water supply system. The various water supply schemes in Nigeria are not consistent and sometimes when it is available it is often not in sufficient quantity which leaves the majority of the people having to look for other supplementary and substandard sources of water. The above situation defines the state of water supply and sanitation in Owo. Public water supply for Owo is supplied by the Ondo State Water Corporation through the Ose water scheme which was designed to supply about 2,000m^2 of water/day to the town on a daily basis. An analysis of water situation in 1984 in Owo carried out by DHV consult shows that out of an estimated 1100ha of the built up area, only 500ha was laid with water mains (DHV, 1986). This shows that less than 50% of the built environment residents enjoy safe water supply (Aribigbola and Omosulu, 2002).

Field investigation revealed that out of the 300 respondents sampled, only 27, representing 9% of the entire population derive and enjoy their water supply from the public pipe borne water. This show a sharp decline from the situation in 1984, when the Ose water scheme had the capacity of serving 26,000 people (DHV, 1986), the situation has deteriorated further. The main reason behind this is the fact that the Ose water scheme that supply water to Owo town which was expected to pump about 130,000 gallons of water to Owo urban per day is operating below capacity, the quantity of water supplied to the town on a daily basis is grossly inadequate, this oftentimes constitute a serious burden on the part of every household who has to travel long distances from their various houses in search of safe drinking water for their domestic needs. The reasons behind this include shortage of manpower, lack of capital/finance, erratic power supply, people's attitude towards public utilities and obsolete/lack of maintenance of their equipments.

Table 2 reveals other sources of water supply in Owo to include stream/river which accounted for 6.7% of the populace, borehole accounted for 25.7%, well 56.3% and others which include those that depend on rain water and those that buy water from water vendors accounted for 2.3% of the sampled population. The implication of the above analysis is that majority of the population depend solely on unhygienic/untreated source of water. Some of the respondents interviewed attested to this that they get water for their daily use from pond, stream and rivers, which are unclean, so many of them especially children contact diarrhea and cholera. In view of the inadequate pipe borne water supply situation in the study area, majority of the respondents travel more than one kilometre in search of water for their daily need especially during the dry season.

Table 2: Sources of Water Supply in Owo Urban

Source of Water	**Frequency**	**Percentage (%)**	**Cumulative Percentage**
Pipe Borne	27	9.0	9.0
Stream/River	20	6.7	15.7
Borehole	77	25.7	41.4
Well	169	56.3	97.7
Others	7	2.3	100.0
Total	**300**	**100**	

Source: Field Survey, July, 2008

From Table 3, it is evident that majority of the population travelled more than 1 kilometre in sourcing water for their daily needs. 69.3% of the sampled population travelled more than 1 kilometre, 18.7% travelled less than 1 kilometre, while the remaining 11.7% of the population were of the opinion that they have their water source within their compound. Majority of the residents of the study area do carry drums, kegs and jerry cans to places like the Federal Medical Centre, Rufus Giwa Polytechnic, the Ose Water Scheme and other locations within the town where there are boreholes in search of potable water. The implication of the above analysis is that the water might have been contaminated in the course of travelling mostly along the road because most of the water containers are not covered, and on getting home neither will the water be treated before consumption, thereby, exposing themselves to water borne diseases such as cholera and diarrhea.

Table 3: Distance covered in sourcing Water

Distance	No of Household	Percentage (%)	Cumulative Percentage
Less than 1 Km.	56	18.7	18.7
1-2 Kilometre	109	36.3	55.0
3-4 Kilometre	76	25.3	80.3
4-5 Kilometre	24	8.0	88.3
Others	35	11.7	100.0
Total	**300**	**100.0**	

Source: Field Survey, July, 2008

A large percentage of the population (70.3%) of the respondents used their water raw without any treatment. This might account for the incidences of water related disease such as diarrhea in the area. Few respondents (14.7%) used water guard (water treatment) or alum (11.7%), while 3.3% of the respondents boiled their water before drinking as presented in table 4.

Table 4: Water Treatment Methods.

Methods	No of Household	Percentage (%)	Cumulative Percentage
No Treatment	211	70.3	70.3
Addition of alum	35	11.7	82.0
Addition of Water guard	44	14.7	96.7
Boiling	10	3.3	100.0
Total	**300**	**100**	

Source: Field Survey, July, 2008

6.1 *Problems of Water Supply and Sanitation in Owo*

In the course of the study, a number of problems were identified. They include: Lack of attention to maintenance and sustainability, it is a common thing to come across damaged water pipes in the areas where we have them within Owo urban with water flowing continuously for days unattended to. This constitutes waste of resources which economically translate to waste of public funds. Erosion has also exposed many pipes to the risk of being damaged by men, vehicles and construction activities. Other related problems include inadequate supply and irregular supply which made consumers to supplement their water consumption with other sources of water such as well, boreholes and stream water, the dependence of the populace on these poor water sources comes with diverse consequences; inadequate coverage of pipe borne water distribution network, poor quality and increased time cost in the process of getting water for their daily needs. Some of the people go as far as buying water from jerry cans, whose original source they are not sure of. This unhealthy source of water accounts for the causes of severe cases of sickness and diseases such as typhoid, cholera and the rest, which kill thousands of people on a daily basis.

Inadequate funding on the part of the government is another problem facing water supply in Owo. Both the local and state government has not done enough for the people of the study area as regards water supply of piped water to Owo. DHV (1986) recognized that investment in capital projects is being financed though capital grants from Ondo State Government. The size of these grants has been progressively reduced over the last few years, from 8.4 million in 1979 to 2million in 1984 (DHV, 1986).

It takes a strong will for government to embark on, and sustain projects that affect the welfare of the people. It is unfortunate to note that the State Government has not really funded the Ose Water scheme for it to maintain its equipments and equally get the materials needed for the treatment, production and distribution of water in other to meet the water demand of the people of the study area. Other findings include the shortage of manpower, people's attitude towards public property, low revenue collection from consumers, as well as the increase in population/area of the study area.

VII. RECOMMENDATIONS

In order to meet the Goal 7 Target 10 of the millennium Development Goal before the target year, 2015, the following policy recommendations should be adhere to. Since safe drinking water and basic sanitation is of crucial importance to the preservation of human health, especially among children, there is the need for proper funding of the Ose water works. The Ondo State Water Corporation should endeavour to repair or replace obsolete and outdated pumps at Ose water works, repair/change damaged pipes and laying of new water pipelines to the entire length and breadth of Owo township to ensure availability of safe drinking water in every part of the city so as to reduce the distance travelled in getting safe drinking water, and the resuscitation of the reservoir at Rowntree in order to store water for distribution to Owo urban.

In the alternative, while construction of new dams and rehabilitation of old one may be so huge investments, boreholes and wells may be constructed and equipped with submersible pumping machines. Water from the boreholes and wells could be pumped to overhead tanks which will be connected to pipeline networks that will distribute water to points of consumptions-homes, schools, hospitals, industries, farms, recreation centres, hotels etc. it is essential that planning take into cognizance the fast growing population and the extent of the built-up areas, and of course, the consequent expansion of such schemes.

There should be great involvement of private sector in water supply and distribution through innovative approaches like public-private partnership (PPP). The involvement of private ownership and franchise in water provision will improve efficiency and reduces government financial risks.

Moreover, there is an urgent need for the Government of the day to embark on awareness campaign, organization of workshops, use of the print media as well as radio and television jingles to sensitize the people on the need to boil their water before drinking and treat by adding alum to remove the sediments. Equally to ensure sustainability of water by ensuring proper payment of revenue as well as maintaining and reporting damage water pipes promptly and also to ensure genuine public participation in water supply planning and effective sanitary environment.

Since municipal water supply facilities are built and designed to serve a targeted population, there is the need to

construct new water schemes with increased facilities in order to meet the ever increasing population of the study area.

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VIII. CONCLUSION

Recognizing the fact that population growth is at an alarming rate and the demand for safe drinking water can not be met by the present level of supply, Sustainability of water supply in the study area therefore will be a mirage except fundamental issues raised above as affecting water supply are addressed. However, in achieving the MGD goal 7 targets 10 therefore changes in behaviour and attitudes on the part of the government and the inhabitants of the study area is a prerequisite.

REFERENCES

[1] Adaramola M.A. (1990): "River basin Approach to Water Supply management" in Tech Forum, Vol. 2, No 1, Pp 17.

[2] Adebiyi, J.K. (1996): Urbanization Process: A challenge to Natural environment (Owo Case study) in Research and Technical Journal, Ondo State Polytechnic, Owo. Vol. 5 No.1. 77-89.

[3] Ajayi M.O. (2005): Millennium Development Goals and the Nigerian Institute of Town Planners: An Explanatory Thought, paper presented at Nigerian Institute of Town Planners Conference in Enugu, 16th– 19th November.

[4] AQUASTAT-FAO (2010): Country Fact Sheet, Nigeria. http://www.fao.org/nr/aquastat. Assessed 29th December, 2010.

[5] Aribigbola A. and Omosulu S.B. (2002): "Water Supply Situation in Owo: Implication for Sustainable City development in Nigeria". In Amole D. et al The City in Nigeria: Perspective, Issues Challenges and Strategies, proceedings of National Conference, Faculty of Environmental Design and Management, Obafemi Awolowo University, Ile-Ife 246-251.

[6] BBC Report (2001): Population Growth and Dirty Water Earth Summit programme.

[7] Buell, R.W. (1984): Developing World Water, London Grosvenor Press, Pp 80.

[8] DHV Consulting Engineers (2006): Ondo State Urban Development Project. Project Preparation Study, Final Report.

[9] Ifabiyi I.P. (2000): Water Resource Utilization Implication on Environmental setting" in H.I. Jimoh and I.P Ifabiyi (ed) Contemporary Issues in Environmental Studies. Haytee Press and Publishing Co. Ltd Ilorin, Nigeria.

[10] Ince, M. Bashir, D, Oni, O. Awe, E.O. Ogbechie, V. Korve, K. Adeyinka, M.A. Olufolabo, A.A. Ofordu, F. Kehinde M.(2010): Rapid Assessment of Drinking Water Quality in the Federal Republic of Nigeria: Country Report of the Pilot Project Implementation in 2004-2005. WHO/UNICEF.

[11] Kabbaj, O. (2004): The Water Supply and Sanitation Initiative of the African Development Bank. Paper presented at the 12th session of the UN Commission on Sustainable Development, New York. 29th April, 2004.

[12] Monday, J.O. (2004): Environmental and Social Management Framework: National Urban Water Sector Reform Project (NUWSRP) Report, Nigeria..

[13] Sullivan, C.A., Meigh, J.R., Giacomello, A.M., Fediw, T., Lawrence, P., Samad, M., Mlote, S., Hutton, C., Allan, J.A., Schulze, R.E.,Dlamini, D.J.M., Cosgrove, W., Delli Priscoli, J., Gleick, P., Smout, I., Cobbing, J., Calow, R., Hunt, C., Hussain, A., Acreman, M.C., King, J., Malomo, S., Tate, E.l., O'Regan, D., Milner, S., Steyl, I. (2003): The Water poverty Index: Development and Application at the Community Scale. Natural Resource Forum , 27, pp 189-199.

[14] UNCH (Habitat)/UNEP (1998): Sustainable Cities Programme (SCP) United Nations Development Programme (UNDP) (2006): "Human Development Report 2006: Beyond Scarcity, Power, poverty and the Global Water Crisis. www.hdr.undp.org.

[15] Urban Age (1992) Cities and UNCED: Broadening the Environmental Debate, Vo.1, No 1,

[16] Ushman D. (2003): The coming of Water Crises. Population Inforation Programme. U.S.A.

[17] Water Org. (2010): "Water Facts", www.water.org Accessed 10th June, 2012

[18] WHO (2004): Meeting the MDG Drinking Water and Sanitation target: A mid-term Assessment of progress. http://who.int/watersanitationhealth/monitoring/jmp/2004/en

[19] WHO and UNICEF (2006): "Meeting the MDG Drinking Water and Sanitation Target: The Urban and Rural Challenge of the Decade". Geneva.

[20] WHO and UNICEF JMP (2010): Progress on Sanitation and Drinking Water; 2010 Update, WHO, Geneva. ISBN 978 92 4156395 6

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