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WATER SUPPLY SITUATION IN OWO, ONDO STATE: IMPLICATION FOR SUSTAINABLE CITY DEVELOPMENT IN NIGERIA

Afolabi Aribigbola PhD,

Department of Geography and Planning Sciences,

Adekunle Ajasin University,

P.M.B. 001,Akungba Akoko,

Ondo State,Nigeria.

faribs1@yahoo.com

aribigbola@adekunleajasinuniversity.edu.ng

Samuel Bankola Omosulu,

Department of Urban and Regional Planning,

Rufus Giwa Polytechnic,

P.M.B.1019,Owo,

Ondo State,Nigeria

Abstract

Water has been recognized as an essential requirement of all living being and breathing things. It is for this reason that every government the world over struggle to provide and maintain reliable water supply to meet the multifarious domestic, industrial and social needs of their citizenry. This has also constituted a priority of urban development especially in the developing countries. This paper is, therefore, designed to summarize the findings of determination of water supply and demands in Owo, Ondo State, Nigeria. The research team used both direct and indirect methods of data acquisition. The methodology produced some illuminating insights into the situation as well as problems of water supply in the city. The paper also identifies the implications of inadequate and unreliable safe drinking water supply in Nigerian

city for sustainable city development. The study found that while the aggregate water demand is rising in the city the supply to cope from public source is decreasing due to a number of factors, which include several years of neglect of water supply facilities and the extension of water infrastructure to the newly developing areas of the city. The paper recommended a new approach to water supply to embrace more citizen participation as well as transfer of water supply to local government in line with global practice. The paper concluded that the present approach to piped water supply is inadequate or appropriate to meet the needs of the city in a sustainable way.

Introduction

Infrastructure is one of the areas in which government policy and finance have an important role to play because of its pervasive impact on economic development and human welfare (World Bank, 1994). This stems from the fact that one of the basic requirements of urban welfare is water. Thus, Ince (1981), contended that water is needed in sufficient quantity and quality for a healthy life. The UNCH (Habitat) (1998) identified urban problems throughout the less developed countries to include environmental degradation, inadequate shelter, infrastructure, water supply, poverty and un-employment. Estimates from the world Health Organization (WHO), indicates that 25 percent of all urban dwellers in developing world do not have access to safe water supplies and… percent do not have on adequate sanitation. In addition, the UNDP- World Bank water and initiation programme indicate that by the yea 2000 more than 600 million urban people will lack adequate sanitation and 450 million will lack safe drinking water (urban Age, 1992). Again urban Age (1991) also indicated that less than one half of the population in the developing world has no access to safe drinking water.

The above underscores the gravity of the problems of safe drinking water in developing countries cities including Nigeria. However, supports for addressing urban environmental problem have taken a central position at the United Nations Conference on Environment and Development (UNCED). A major recurring theme in these meetings is that the world's growing urban populations needed attention. Besides, a crucial outcome of the debate of the conferences embrace environmental debate to include those issues most crucial to people living in the developing world's cities particularly the poor, clean water and adequate sanitation, urban smog, indoor air pollution and improper drainage affect million of urban dwellers resulting in 3 million deaths a year among children from diarrhea alone (urban Age, 1992). Yet the Nigerian cities are expected to participate or join in the global efforts of sustainable development and especially UNCHS/UNEP anchored sustainable cities programme (SCP).

Consequently, if Nigerian cities are expected to participate in the global trend of sustainable environmental improvements or innovations that focus on projects such as water supply and sanitation, solid waste management, air pollution, environmental health, and access to means of livelihood, there is a need for a better understanding of the existing situation of facilities and infrastructures in these cities. Since improving the adequacy and quality of water supplies is a

priority for sustainable city development. This paper is therefore designed to summarise the results of the research conducted into water supply and distribution in Owo, Ondo State and determine the implication of the existing supply situation for sustainable city development.

Conceptual Considerations

The role of infrastructure such as safe drinking water in societal welfare and development has long been recognized. According to Morris and Brown (1993), Infrastructure is regarded as "the systemic framework which underpins community's ability to fulfill its mission of providing a base for its citizens to be productive and to nurture social equity. It is a kind of public trust of commonwealth upon which every citizen rely and draws for prospect and day to day socio-economic opportunities. When it functions efficiently the whole society benefits and the resultant effect is manifested on the growth and development of the community, when it functions below expectation, everybody pays in kind and cash (Akinola, 2000).

Water supply like energy, capital and communications is a very important infrastructural pre-requisite for sustainable development. Apart from its primary role in enhancing human health and wellbeing, it is equally important for industrialization and commercial developments (Olokesusi, 1987). Adequate water is absolutely necessary to support the population and economic life of a city. Critical shortages of water not only inhibit or stop economic development but also directly damage the health of the city's people (UNCHS/UNEP, 1998). This is why Pickford (1981), contended that "without water, there is no life, he cautioned that bad water could be almost as harmful as no water at all. The recognition of the significant role of water resources to support life in a city and its use for urban development has instigated interest on it at the global level and its inclusion on the subject of sustainable development and environmental sustainability. According to UNEP (1998), the environmental resource systems which are important for sustainable urban development include water resources, among others.

The Brundtland Report defined the notion of sustainable development as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. This definition is general, but the UN (1996) elaborated on the definition further by describing sustainable development "as the economic, social and environmental aspirations of groups, which may or may not have economic priority. The main ideal behind this notion is to create an effective system of resource distribution and utilization with a long-term perspective in mind. Consequently, UNCED has produced Agenda 21 which states that "urban growth has outstripped society's capacity to meet human needs, enslaving hundreds of millions of people without adequate incomes diet, housing and services". Therefore chapter 18 of Agenda 21 specifically alludes to the need for "special attention" to be given to the growing effects of urbanization on water demands and usage.

Therefore, the objective of sustainable development and technical infrastructure policy is to serve present and future populations and support economic activities in a manner which makes for the efficient and effective use of existing services and provides planned service improvements when and where required; while contributing to a healthy environment. In order to achieve sustainable water supply to cities UNEP (1998), indicated that water resources must be considered in terms of quantity, quality, and accessibility.

The study Area

Owo is the headquarters of Owo Local Government Area of Ondo State. It is located about 45 kilometers East of Akure, the Ondo State Capital. Owo lies on latitude 7^0 15' North of the Equator and longitude 5^0 35' East of Greenwich Meridian. It is about 150 metres above means seal level. 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 27^0c (80^0f), with marked seasonal changes in rainfall and relative humidity. Owo like other tropical areas of Nigeria enjoys abundant rainfall of over 1,500 millimeters yearly. 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 155,000 and her population was estimated to be 176, 955, is area based on the 1991 population figure of 155,006 and using a growth rate of 2.5% estimated at 203,381.

Data Sources and Methods.

In the literature on environment sustainability, an accounting process has been initiated for the study of natural resource in its entirety. Thus a system acronym SEEA (System Integrated Environmental and Economic Account which according to Lange (1998), emphasis the needs for the creation of a detailed physical 'data base' and the integration of natural resource accounts (NRA) with economic model for policy analysis is initiated. The above process although ideal for a serious research work, it is devoid of any serious application in the developing world due to the death of necessary data and relevant information for serious analytical research work. Following from the above therefore, a more relevant and acceptable empirical study has been adopted in carrying out this research. Therefore, the data used in this paper were derived from both primary and secondary data sources. Towards this end, a sizeable proportion of data was collected from the field through questionnaire administration and indepth interview of officials of water supply agency in the study area. Two sets of questionnaires were designed to elicit relevant information from the resident population and the agency responsible for water administration and management in the study Area. In addition, this was supplemented with secondary data was obtained from some published and unpublished sources.

Public Water Supply in Owo: Antecedents and Development

Public water supply for Owo is by the Ondo State Water Corporation (OSWC) through the Owo scheme which also serves Iyere, Isuada, Ipele and Emure-Ile. The Ose water works which supply water to Owo was commissioned in 1960. The design capacity of the scheme is 2,250 cubic meters per day, out of which about 2,000 is consumed by Owo (DVH, 1986). The River Ose serves as secondary source of piped borne water supply to the city. The intake, treatment plant and pumping station are located along the Owo-Ikare Highway from where treated water is convey by a rising main with a length of 9.1km and a diameter of 250mm. In Owo the water is distributed through a network of pipeline system with a total length of 13.4 km and diameters ranging from 75mm to 200mm. This distribution system covers an area of about 500 ha (DHV Consult, 1986). The storage capacity in Owo consists of one water reservoir of 2,115m^3.

In 1984 the existing production capacity of Ose dam could only serve 26,000 people and upgrading the network would increase this to 31,000 people, this corresponds to 30% of the estimated population in 1984 (DHV 1986). Consequently, an argumentation scheme that will increase this

capacity to 66,000 was proposed and commenced – as Ogbese scheme. At present, the Owo argumentation scheme that started in the 1980s is yet to be completed. Our field investigation revealed that the project has been abandoned. In 1998, there was a tripartite agreement between the World Bank, Federal Government and Ondo State Government to rehabilitate, improve and expand public water supply network and its associated problems in Owo, Akure and Oke Igbo. In pursuit of this, a consultant was appointed to carry out detail study of water supply in Owo. The consultant has since completed and submitted the report of their study. Almost fourteen years after, the anticipated repairs and expansion is yet to commence. However, some years back, new pipelines were being laid from the pumping station at Ose and Owo township. The essence of this was to boost the transportation of treated water from the treatment plant to the reservoir at Rowntree, Owo. How far this would go to improve water supply to the town cannot be easily ascertained at present. At present, most part of the city remains without water pipeline network.

Existing Situation of Water Supply in Owo

As indicated earlier, the Ose water scheme was designed to serve five autonomous communities of Owo, Iyere, Isuada, Ipele, and Emure –Ile. The scheme was designed to supply 2250m^3 of water/day, out of which about 2,000m^3 is expected to be supplied to Owo town on daily basis. An analysis of water supply situation in 1984 in Owo by DHV consult shows that out of an estimated 1100ha of the built up area only 500ha was laid with water mains (DHV 1986). Technically less than 50 percent of the built environment residents enjoyed safe water supply. This has increased substantially since then because newly areas are not served with water pipelines. Indeed, the above situation has deteriorated further since 1984. Field investigation revealed that out of the five quarters that make up the town, piped water from public source is only available in two quarters. The remaining three quarters do not have access to safe water from public source. (See table 1).Besides the small number of people that enjoy this service in the two zones, only 9.3% of the sample population derived their water supply from public source when this is contrasted with the situation in 1989 when 57% of households rely on public water supply (Adejuwon, 1989) the situation has really deteriorated. According to the table other sources include well 72.06% percent, stream 7.2% borehole 9.7% and others which include rainfall accounted for 1.62 percent. The implication of this result is that majority of the residents of the city depends on well for their water supply.

At the inception of Ose water scheme it has the capacity to treat and pump 2,250m^3 daily. At present, field investigation revealed that the scheme is no more able to meet up with this capacity. However, when the authority of the Ondo State Water Corporation was asked the quantity of water being pumped to the city daily, they gave a figure of 2,587,500 litres. Although, it was impossible to determine the quantity of water that get to the town, evidence abound that the quality of water being supply to the city is grossly below this amount. First, as discussed above only two quarters still enjoy limited safe drinking water. When the residents of the two quarters were asked to rate the adequacy of piped water supply majority rated it to be insufficient. Responses of the resident indicate that they received water from public sources twice weekly. Apart from the above, the quantity claimed by ODSWC to be making available to the city daily when examined vis-à-vis the current population shows that it falls below acceptable standard.

Table Two below shows the trend of population growth, the quantity of water the Ose Dam can supply, the shortfall and the per capital quantity the present facility can supply. The above is based on the original installed capacity of the Ose water works. Field investigations revealed that they are not supplying anything close to the above. The quantity required is calculated using the 25 litres per capital recommended for an individual per day. In the past, there was a schematic way of distributing water to each quarter. According to ODSWC, a quarter has water twice in a week but due to the dwindling capacity of the pumping machine the distribution of water twice in a week has become history. Besides, the water reservoir at Rowntree area of Ehinogbe which was designed to distribute water to all section of the city has remained empty for a long time. Further investigations revealed that the reservoir is still in order but not utilized due to the inability of the existing water pumping machine to pump water into the reservoir.

Citizen Participation in the Provision of Potable Water in Owo

One of the major principles of sustainable development is stakeholder's participation in the provision and management of public utilities. In respect of water provision, people's participation is limited to payment made for water consumed. Our investigation reveals that a meager sums of #100 and #15 is charged for water consumed by a three bedroom flat and a rooming apartment resident respectively. The meager amount being paid by the consumer, apart from the fact that they do not come in regularly, are grossly inadequate to initiate any change in the existing precarious water supply situation in the study area. According to OSWC between 1995 and 2001, a period of six years, less than #50,000 was realized as revenue from patron or consumers of water supply in the city. Thus, the Ondo State government has remained the only source of funding water supply in the city through ODWSC.

On whether the residents are ready to pay users charges as shown on table 3, a sizeable percentage of respondents (67%) subscribed to the concept of users charges. However by how much and to what level will need to be ascertained by further research. On private sector participation in water supply, the study found that there is no organized private sector involvement in water production in the city. However some boreholes such as those at Uka junction, at the white house junction on the road to the Polytechnic were said to have been provided by private individuals, others, such as those at front of Imade College are being constructed by the Federal Government. Besides during the study, there is no notable private sector involvement in safe drink water supply in the city. Thus the major source of safe water to this city is the ODSWC, other affluent member of the city have boreholes serving their household or families. Water supply from this sources is very low, as shown on table 1, it accounts for a mere 1.62 percent.

Problems of Public Water Supply in Owo

In the course of the study, a number of problems confronting the ODWC in their endeavour to supply adequate water were discovered. These are summarized in this section. One of the most important problems identified is inadequate and unreliable power supply from NEPA. According to ODSWC this is a major problem facing the establishment. As a result they are unable to pump water for the number of hours that will be adequate to supply the town. Attempt to solve this power problem led to the installation of a generating set to augment power supply from NEPA. This too is

bedeviled by overwork, escalating cost of procuring fuel and outright shortage of diesel fuel at times.

Another problem associated with piped water supply in the city is that the distribution networks according to our investigations the existing network of water pipelines in the city were installed in the early 1960s. As a result they have become old, inadequate with many burst pipes along the main line. Thus, areas developed since the 1970s do not have water networks. Closely related to this, are the damages to services pipes during road construction and other land use activities.

Inadequate finance is a major problem of inadequate supply of piped water to Owo. According to DHV (1986) investment in capital projects is financed through capital grants from Ondo State Government. The size of these grants has been progressively reduced over the last few years, from 8.4 million naira in 1979 to 2 million in 1984 (DHV 1986). The study found that allocation of resources to the corporation depends on the mood or disposition of the state Governor and not as a matter of state policy or the concept of need. Other problems according to ODSWC embrace stealing of water treatment equipment, old pumps, old pipes and lack of booster station to enhance and facilitate water supply and distribution in the city.

Sustainable Development Implication and conclusion

Within the context of sustainable development approach, the goal of infrastructure policies is to serve the present and future population as well as support economic activities. From our investigation, it was revealed that public water supply to Owo has not only become inadequate but the quantity being supplied has declined over the years. Consequently as demonstrated in the paper current supply cannot cope with the present needs not to talk of meeting the needs of future generation. Besides, the study also revealed the non participation of citizenry and other stakeholders in the provision of safe drinking water supply in the city. And that public water supply is bedeviled by many problems hampering their ability to supply adequate water to meet the needs of residents of the city at present and there are not immediate proposal to improve the situation.

With regards to the issue of planned service improvement and expansion in line with sustainable development approach, the paper indicated that adequate efforts are not made to improve the service of the corporation to the town as well as expanding it services especially to areas not serviced by the corporation and to extend their distribution network to new areas. Infact the study shows that piped water ceased from reaching many areas of the town since 1994 and since then nothing significant has been done to change this retrogressive trend. What the above call for is urgent action in the immediate to improve and enhance supply to meet the needs of present residents of the city as well as strategic action plans that would seek to expand safe water provision to meet the needs of future residents of the city. Towards this ends, the abandoned Ogbese argumentation scheme need to be revived and completed by the state government, while the Owo scheme should also be upgraded. The combined capacities of these two schemes are adequate to meet the needs of the resident of the town for a long time. The improvement and expansion of network distribution propose in 1998 should also be executed by the state government. After this, the state government should transfer the day-to-day management of water supply to the Owo Local Government Authority. Although, Local Government in Nigeria has been criticized as being weak and will be unable to carry such responsibilities, the fact remains that they are the closest government to the

people and this is in line with global trend and approach. All that will be required is to strengthen the local government and allow them to take on its responsibilities and grow.

One of the principles or components of sustainable development is that it emphasizes and encourages broad participation by shareholders. The result of our study indicated low users participation and lack of organized private sector participation in water supply. The study is indicative that majority of the respondents rely on well dug in their compound. There is a need to go beyond this by organizing communities to pool resources together to construct boreholes that will be treated by experts and linked to all building in the area. This will provide a frame to enjoy safe water. In addition to the above profit oriented companies should be encouraged to go into water production and distribution in the long run. The present practice where the city residents rely wholly on public sources may not be sufficient to ensure sustainable development in the city.

Conclusion

From the above exposition and analysis, the paper indicated that safe drinking water from the public source is not only grossly inadequate to meet the needs of present but that there are no strong policy initiatives to promote and enhance the existing facilities to meet future needs. The paper also revealed non participation of stakeholders in the provision and management of piped water in Owo.

The paper therefore, recommended new policy initiative and action plans to improve, upgrade and expand water service provision and delivery in the town. That the Local Government should be strengthened and given the responsibility of managing water supply in the city and to promote more stakeholders participation in safe water supply in the city.

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Table 1: Sources of Water Supply

S/No	Source	Ijebu	Ehinogbe	Isaipen	Iloro	Okedogbon	Total	%
1.	Pipe borne	4	-	-	-	19	23	9.3
2.	Well	36	36	44	40	29	178	72.06
3.	Stream	4	8	2	3	1	18	7.28
4.	Bore hole	4	4	3	5	1	24	9.72
5.	Others	2	1	1	-	-	4	1.62
	Total	50	49	50	48	50	247	100

Source: Field Survey, April 2008

Table 2: Population growth and piped water supply

	Population Growth	Quantity Supplied (in litres)	Quantity Required (in litres)	Shortfall (in litres)	Per capital Supplied
1953	30,662	-	-	-	-
1963	80,413	2,000,000	2,010325	10,325	24.87
1980	103,000	2000,000	2575000	575000	19.4
1984	112,000	2,000,000	2800,000	800,000	17.86
1991	155,006	2,587,000	34311994	155006	16.68
1996	176,955	2,587,000	4423875	1836875	14.62
2002	203,381	2,58700	5,084525	2497525	12.7

Source: NPC 1996: DVH Consult 1986; O D WC and field Survey 2008

Table 3: Users Service Payment

Quraters	Yes	No	Other
Ijebu	35	15	-
Ehinogbe	38	11	1
Isaipen	1	7	2
Iloro	24	19	5
Okedogbon	39	21	-
Total	167 (67%)	73 (30%)	

Source: Field Survey, 2008