

Research Article

Water Problems and Community Development: A Case Study of Igbo-Ora Community of Oyo State, Nigeria.

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Abstract

Water is known to be an inexhaustible resource because the total supply of it in the biosphere is not affected by human activities. Recycling time depends on various factors. It is not uniformly distributed all over the world and not readily available in the quantity and quality required in most parts on the earth surface. This piece has examined the sources, the crisis of scarcity, and development of water and alternatives in Igbo-Ora, Nigeria. The climate is tropical continental. The major occupation is farming. Major sources of water supply are the ponds, rivers, lakes, and rainfall. Opeki Dam is perpetually dry, that is, not to talk of the pipeline networks and taps that are spent. The consequences of the crisis of inadequacies have been so grievous. Whatever is available must be conserved and preserved to meet all needs. A revisit to Opeki Dam for purpose of rehabilitation is imperative. At the interim, rain water should be harvested, stored and put to use on a large scale on farms and for small scale industrial productions. Farmers should make maximum use of dews. Oyan Dam could be made to serve Igbo-Ora community. Damming Ofiki River is also suggested.

Key Words: Water problems, community development, rain water, Igbo-Ora.

Introduction:

Of all human settlement services, provision of portable water is perhaps the most vital: Every person depends on water for drinking, washing, carrying-away waste and other domestic needs, (Encyclopaedia Britannica, 2004). According to this document, water supply system must also meet requirements for public, commercial and industrial activities. These explain why, during drought, floods, earthquake or other emergencies, vigorous efforts must be made to maintain water supplies, (Griggs, 1997 and Mayer, 2005).

Water has an important factor in the location of the earliest settled communities, and the evolution of public water supply systems is tied directly to the growth of cities and towns. In the development of water resources, beyond their natural condition in rivers, lakes and springs, the digging of shallow wells was probably the earliest innovation. As the need for water increased and tools were developed, wells were made deeper. Again, according to the Britannica, brick-lined wells were built by city dwellers in the Hindus river basin as early as 2500C, and well more than almost 500 meters (1,600 feet) deep are known to have been used in ancient China.

It may be considered an inexhaustible resource because the total supply of water in the biosphere is not affected by human activities. Water is not destroyed by human uses, although it may be held for a time in combination with other chemicals. To be useful, however, water must be in a particular state and place and of a certain quality and quantity and so, it must be regarded as renewable and often scarce resources. The recycling times depend on its location and uses.

Water is present in abundant quantities on and under the earth surface but less than 1% of it is liquid fresh water. Most of the earth's estimated 1.4 billion cubic kilometer (326 million cubic miles) of water is in the oceans or is frozen in polar ice caps and glaciers. Ocean water contains about 35 gms/litre (4.5 ounces per gallon) of dissolved minerals or salts. These make it unfit for drinking and for most industrial or agricultural uses. Although it may not always be available at the times and place it is needed, and it is not uniformly distributed over the earth, in many locations, the availability of good quality water is further reduced because of urban pressure, industrial and environmental pollution.

However, the objective of this paper is to examine the salient sources of water, the crisis of scarcity of water and a developmental alternative if the community must survive and play its vintage roles. The population of the town was about 35,000 by the 1963 census. It has grown to about 100,000 today (an estimate). 755 (0.76%) members of the community were interviewed. The respondents to the interview schedule were randomly selected across the quarters, sex, age and professions in the town. All the seven heads of the seven quarters were interviewed. They provided a little history each about the sources of water, the uses of water and the seriousness of the present crises of scarcity. The paper is in seven parts: Part one is the introduction. Part two is a brief description of the Study Area, Igbo-Ora. Part three is the uses and sources of water supply to the community. Water crisis is described in part four. Part five is general comments; and the sixth part make suggestions towards water development and sufficiency. Part seven concludes. The word 'Community' and 'Igbo Ora' are used interchangeably to mean the entire town and its dwellers.

Igbo-Ora of Ibarapa

The town, Igbo-Ora has its history dating back to early 18th Century. The town started with seven different quarters Igbole (the smallest), Pako, Iberekodo, Saganun, Idofin, and Igbo-Ora (the largest). Like every others, Igbo-Ora quarters had expanded so fast even since the earliest days to include Isale Ogede, Isale Oba and Okeserin. Each of these quarters had a traditional administrative head, the Baale. But the whole of the area is bounded by political, geographical location, proximity, language, ethics and values. By consent, the name Igbo-Ora was adopted for all of them. Igbo-Ora had always been the Administrative Headquarter of Ibarapa Local Government Area, that is, when the seven towns Lanlate, Eruwa, Igbo-Ora, Idere, Tapa, Aiyete and Igangan were one as a Local Government Area in Oyo State. Still, the creation of three Local Government Areas from the former led to the creation of Ibarapa Central and Igbo-Ora remains the administrative Headquarters.

Physically, there are a number of inselberge but they do not disturb the large expanse of guinea savannah – that is, open for agricultural practices. There are some rivers that surround and traverse the town. They are very seasonal. That is, having water flowing only during the raining season. They include Ofisa, Afekiti and Agogo rivers. Aside these rivers, there are some swampy locations and ponds that are good sources of water to the inhabitants. Rainfall is not less than 2,500 mm any year. Temperature is high throughout the year (about 27^oC). Relative Humidity is not less than 70% on the average. The Climate is tropical continental. Two seasons can be distinctively experienced: wet and dry seasons. The wet season is characterized by low temperature and high rainfall. All the wetness gets culminated in the months of June and July. It is the planting season. There is always a double maxima which allows for double planting seasons. On the other hand, the dry season is characterized by haze and dusty wind that prevails from North Eastern Nigeria (the harmattan). The harsh weather gets culminated in January and February of every year. It is the major harvesting season. The land is fertile and can sustain all year round planting if there is sufficient moisture, (Ayoade, 2001). The community and the town at large is a major source of food and labour supply to the neighboring Lagos metropolis, Abeokuta (Ogun State) and the Ibadan (Oyo State) urbans. Igbo-Ora is substantially sustaining availability of major perishable food items such as cassava (in its various forms), plantain, yam, pepper, banana, tomatoes, fruits and others. More than 80% of the charcoal and fire wood consumed in these neighboring urban centres (of Ogun, Lagos and Oyo States) come from Igbo-Ora and immediate environment. Also the community accounts for over 2.5% of petty traders and labourers of every trade and profession in those urban centres, (Mabogunje, 1980 p 182). They are big time merchants trading in cassava, yam, maize, pepper, tomato, cashew, banana, plantain, orange, guava and few other fruits. Oil palm and coconut are only growing wild not much of them are really cultivated.

The people of about one hundred thousand are Yoruba speaking. Major occupations are farming and trading but in the recent time, more men and women are diversifying into artisan jobs, banking, tourism management, construction, evangelism; and of course quite a number have white collar jobs. Thus, there are hospital and health workers, nurses, doctors, attendants, secretariat workers, teachers and lecturers, and office workers. Interestingly, all of these need water directly and or indirectly in their offices, at homes, schools, hospitals, in construction, on the farms and others. Coincidentally, the community kept on expanding in area extent, population size, occupation and profession and in other needs. The spatial expansion has drastically affected the traditional sources of water – the ponds, rivers streams and water sheds.

In spite of the uniqueness and significance of the town and the community politically, socially and commercially, major sources of water are rainfall and dew. Opeki dam meant to supply water to the community is perpetually dry, that is, not to talk of the pipeline networks and taps that are spent. However, the following discusses the uses to which what is put and the sources of water in the community.

Uses and Sources of Water:

Apart from the traces that are present in the atmospheric air, which is essential to live, every individual depends on water for drinking, cooking, washing, waste disposal and other domestic needs. Table I shows the major uses into which water is put among the members of the community – just like it is common to most communities too, (Schacke, 1970 and Phillips, 2003).

100.00% of the people interviewed and responded to the question on uses of water used water for drinking, cooking and in agricultural practices. 92.00% use it in construction and milling. About 80% of them also use it in hospital and laboratory practices, (85.69%), Education and Schools (85.43%), and Local Industrial Productions (84.90%). 17.75% and 21.32% for religion/recreation and entertainment and heavy industrial productions respectively might have been that low because of the low level of development and industrialization of the entire region. (See Table I below). In other words, as it is in other human settlements known, (Aderogba, 1999, Griggs 1997 and Mayer 2003), water is a significant element in this community. Comparing water with some other facilities and amenities, electricity, roads, hospitals, and others, the community rated water highest and as the most significant infrastructure for development. 620 (82.12%) rated it as the

Table I: Major Uses of Water in Igbo-Ora.

Major Uses	Number	Dependence (%)
Drinking	755	100.00
Cooking	755	100.00
Washing	755	100.00
Hospitals and Laboratories	647	85.69
Waste Disposal	321	42.52
Research & Development	335	44.37
Education & Schools	647	85.43
Religion/Recreation & Entertainment	134	17.75
Local Industrial Productions	641	84.90
Construction	748	99.02
Heavy Industrial Productions	161	21.32
Farming and Horticulture	755	100.00
Others	332	43.97

Table II: Water Compared with Some other Facilities and Amenities.

Amenities	Number	% Proportion
Electricity	101	13.38
Water	620	82.12
Transportation	30	3.97
Hospital	387	4.90
Market	11	1.45
Schools	44	5.83
Others	12	1.59
Total	755	100.00

most significant. Interestingly, none of the respondents rated it lowest in priority. See Table II. Electricity (13.38%), hospitals and maternity homes (4.90%), transport and communication (3.97%), markets and stores (1.46%), schools and colleges (5.83%) are not as important as water to members of the community. Why? Without water the other facilities and amenities may not be useful to mankind in human settlement. Though, at times, one complements the other, water has no rival. With water, probably every other thing is possible – agricultural practices, industrial production, education and research, tourism and recreation, waste management and others. (Viessman and Welty 1985 and Lamb, 1985).

But what are the sources of the water the community use to meet their needs on the farms, in industries, domestically, for recreation, religious, educational and research purposes and for waste disposal. Table III is revealing. A respondent picked more than one source. 96.50% depend on rain water. Over 80% depend on streams and rivers. Swamps, lakes and ponds are the sources for over 60% of the respondents. See Table III. In spite of the proliferation of bottled and sachet waters, all over, only 0.01% use bottled and sachet water. Wells (17.50%), boreholes (1.50%) and pipe-borne water (0.05%) are not common either. The Opeki River Dam built in:

Table III: Sources of Water to Members of Igbo-Ora Community

Sources of Water	Proportion of Dependence (%)
Swamps, Ponds and Lakes	69.47
Streams and Rivers	88.85
Rain Water	96.52
Dew	6.65
Pipe Borne Water	0.05
Bore Holes	1.50
Wells	17.50
Sachet and Bottled Water	0.01
Others	1.02

- The early sixties (over forty years away) is no longer reliable. It has its peculiar problems:
- It was constructed for a population of less than 90,000 i.e. less than one third of the present population of the entire Ibarapa region that is made up of seven major towns including Igbo-Ora;
- The headwater (supply source) to the dam are grossly becoming inadequate as the major tributary to Opeki River are going into extinction – they are drying up;
- There were virtually no maintenance of the Dam and the reservoir and it is gradually getting sealed off with pebbles, debris and others brought about by the supply sources;
- The pumping systems and the piping (transmission) networks are faulty and inadequate. Most of them have long been abandoned;
- The extension and connections of the pipeline networks are limited to the old suburbs, the new layouts – all over – were left out and neither were they planned for;
- House connections to the public pipes are far less than five per cent of the entire households in the community;
- Even at that, the pipes that connected the old suburbs are of too small diameters and they are spent. Most of them had been damaged, leaking and even got removed in the processes of road maintenance and constructions; and
- The remaining public taps in each of the quarters could be counted on finger tips and they are perpetually dry.

For over ten years, there has never been any drop of water from any tap in the whole town. Thus, one can infer that pipe borne water should not be regarded as any source of water for any sector or section of the town. Members of the community have resulted into alternatives in their dwellings and in their industrial and social lives. But it is problematic to meet the demands:

- Households spend so much money and time per day to fetch enough quantity to use; and
- Very poor waters from unhygienic sources are common and consumed.

Bore holes and wells that have been reliable alternatives to pipe borne water among most members of the communities are either too expensive for individuals to drill and maintain; and or its technology is not yet acceptable to them. It appears the community is not favoured enough to command and own enough number of bore holes. Table IV shows the number of boreholes by ownership throughout the community. The Federal Government provided 1 (10.00%), the State Government 2 (20.00%) and the Local Government provided the largest number 3 (30.00%). The community has 2 (20.00%) and two individuals combined efforts to have one. A Non- governmental organization provided one. Unfortunately, the production of these bore holes are not very reliable. And, the water table is so deep down and the cost of boring and maintaining any is so enormous. Local members of the community could not attempt to own one therefore.

Table IV: Ownership Status of Bore holes.

Owners	Number	Percentage (%)
Federal Government	1	10.00
State Government	2	20.00
Local Government	3	30.00
Community	2	20.00
Individuals	1	10.00
NGO	1	10.00
Others	0	0.00
Total	10	100.00

Consequently, the surest sources appear to be rainfall and dew. The dew may be throughout the year but it is limited in quantity for planting and for survival of few arable crops during the dry season only. Similarly, rainfall though abundant during the rainy season (April to October), it is limited to the quantity that could be harvested during its seasons and mostly for raising crops. Even, the farmers have to supplement for cultivation of some arable crops too.

The traditional sources, streams, ponds, rivers, lakes, and springs are many. See Table V. Each ward in the community depends on different pond, stream, and river and or spring water sources. Agogo stream traverses the town and it used to serve more communities. It is given different local names throughout its stretches even within the community.

Table V: Quarters, Estimated Population and Major Ponds and Streams in Igbo- Ora.

Quarters	Estimated Population ('000)	Swamps/ Ponds/Streams.
Igbole	9.10	Gaa, Baba Kutu.
Igbo- Ora	17.00	Agogo, Abetu, Afekiti.
Sagaun	12.20	Ameyen, Agogo, Afekiti, Idiroko.
Iberekodo	16.40	Agogo, Gbaawe.
Pako	10.20	Gbaawe, Odo Efo, Odo Igbo.
Isale Pembo	5.20	Gbaawe, Odo Efo.
Isale Oba	8.50	Agogo, Isale Ayin.
Isale Ogede	2.40	Agogo.
Oke Odo	4.80	Agogo.
Oke Iserin	8.20	Ameyen, Afekiti.
Idofin	6.00	Agogo, Gbaawe, Abetu.
Total	100.00	

Gaa, and Baba Kutu served Igbole quarters of about 9,100 people. Gbaawe and Odo Efo served Pako and Isale Pembo quarters with an estimated population of about 13,700 people. Ameyen, Afekiti and Agogo served Okeserin (with 8,200 people) and Saganun (12,200 people); and these can no longer be referred to as any river or stream or pond of water. They are not reliable:

- Urbanization processes have exposed their water sheds and banks to excessive harsh weather;
- The remaining waters have been polluted by defecation, urban wastes and animals feedings around them;
- The waters have dried- up in most of them and what remains for each is bare ground and little quantity of water only during the raining season when their waters may not be required; and
- The aquatic environment hitherto found around those places has completely changed to terrestrial. Only patches of interface of both aquatic and terrestrial life forms could be found in a few places.

Table VI shows the composition of the sampled water from the streams, ponds and swamps. On the average, the colour is grey/green, turbidity unit is 29mg/l, organic matters, phenolic compounds (as phenol), and other chemical compositions are higher than the WHO permissible standards. They are more basic than water – the pH is 8.01.

Table VI: Comparison of Sampled Stream Water Parameters with WHO Standard. (mg/l)

Parameter	WHO permissible standard	Sample Reading
Colour	Nil	Grey/green
Turbidity Units	5.00	29.00
Organic Matter	0.50	24.00
Phenolic Compound (as phenol)	0.001	0.002
Fluoride (as F ²⁺)	1.70	2.20
Nitrite (as NO ₃)	50.10	72.50
Cod (Mg 2/l)	-	280.00
pH	6.5-8.5	8.01
BOD (Mgo2/l)	-	250.00
Copper (as CU ²⁺)	0.50	1.01
Iron (as Fe ²⁺)	0.10	1.10

Manganese (as Mn ²⁺)	0.50	0.75
Zinc (as Zn ²⁺)	5.00	10.01
Magnesium (as Mg ²⁺)	50.00	165.50
Sulphate (as SO ₄ ²⁻)	150.00	240.00
Hydrogen Sulphate (as H ₂ S)	0.05	0.60
Chloride (as Cl)	600.00	640.00
Anionic detergent	0.20	3.20
Ammonia (as NH ₄)	0.50	0.91
Calcium (as Ca ²⁺)	75	110.00

Source: WHO and Field Work.

The Crisis of Scarcity and Poor Quality:

- The results of the inadequacies, poor quality and changes in ecological systems have been so grievous on the domestic lives, commerce, education, production and others. In particular:
- Community dwellers put to use all sorts of water for drinking, washing sanitation, food processing and others even when they are not potable;
- Water borne diseases are very rampant and sometimes lead to epidemics across the quarters;
- Though the proportion has gone down so greatly in the recent time, guinea worm is very common at a rate of almost every home experiencing it once in a year;
- All productions that have to do with water are hindered and or limited. In most cases, they are out rightly impossible;
- Though the soil is fertile and can support all season planting, the lack of water places great limitations;
- Cottage industrialists that would have been attracted to the agricultural produce and the cheap labour of the region cannot come to establish;
- Laboratory experiments in schools and colleges, and tests in hospitals are limited and
- sometimes impossible;
- Families, homes, firms and those industries that managed to survive within the region fend for water at very high cost of money, time and labour; and
- For those firms and cottage industries that managed to survived, it tells so much on the unit costs of production.

The problems of inadequacies and scarcities are very grievous and devastating. Sometimes, it takes the entire family the whole day to fetch enough for domestic use. Talk less of the quantity that may be put into use for industrial production. It is most pathetic during the dry seasons; this is when rainfall is very minimal, if there should be any at all. The scarcity, the inadequacies and the poor supply of water in these communities require urgent attention if the community must survive and develop and if water must mean life. As remarked; water is definitely a limiting factor to development in Igbo-Ora and among members of the community.

General Comments and Discussions

There are inadequacies of water for every purpose in Igbo-Ora. Alternatives are not many too. These place great limitations on developments generally and certain forms of livelihood – the economy, recreation and entertainment and even research and development. Whereas, the town is fast assuming urban attributes. The needs to rehabilitate and or develop the existing sources are obvious therefore. There must be enough quantity of quality potable water to meet every need. It has no rival and there have never been any alternatives to it.

Although water is a renewable resource, the many demands for it in a desired quantity and quality in a particular place require careful husbandry of the supply. After reaching the surface of the earth as rain, it enters a supply system either by penetrating the ground and moving through run off into streams, rivers, ponds and lakes. The quantity and quality of supply depend, in part, on the management of the vegetation and soil in the water shed areas. Also involved is the control of stream flow or the control of pumping from underground sources. Where rainfall is seasonal, streams run at flood levels during the wet season but are extremely low or completely dry at other times of the year.

Incidentally, though water is required for a variety of purposes, the community neither requires water for transportation nor for generating hydroelectric power. Neither does it require it for cooling engines nor for use in any steel and or pulp mills or chemical factory; at least for now. The requirement is minimal.

Towards Water Development and Sufficiency

From the foregoing, water scarcity appears to be a major problem that limits development in Igbo-Ora. Whatever is available must therefore be conserved and or further developed at all costs to meet all needs. Thus:

- There should be a revisit to the Opeki Dam with the purpose of re-dredging and or expanding it;
- The population has increased four fold, second and third dams are required to supplement the existing Opeki Dam i.e. if the large scale expansion cannot be carried out on the later;
- The pipes and pumping systems need to be overhauled and or replaced and maintained to be able to support the supply system;
- The rivers, springs and ponds though seasonal, could be developed and the waters from them preserved for fishing, planting and other agricultural processing;
- Rain water should be harvested on a large scale and stored as such. The water could be put to use in small scale agricultural and industrial productions. Domestically, it could be used for washing, flushing;
- Farmers can make maximum use of the ever fresh dews by preparing their fields towards that and supplement it with watering from harvested rain water. This could be particularly so for arable food crops.
- Members of the community should be educated on how to conserve water; and adopt technologies of conservation of water;
- All levels of government – Federal, State and particularly the three Local Governments should endeavor to form concerted efforts to refurbish and maintain Opeki Dam; and
- It cannot be too much for both State and Federal governments to build additional dams on Ofiki and Oyan rivers – all within the region.

Ofiki river passes through a relatively narrow and long stretch of valley of hard rocks. This singular attribute will reduce cost of construction. The volume of water is large throughout the year. And, regardless of the point(s) the river should be dammed, proximity to Tapa, Aiyete and Igangan will also further reduce the total cost of construction of the pipe line network. Oyan Dam on Oyan River, though at the boundary of the region (to the South West), it was initially designed to serve Abeokuta and parts of Lagos metropolis. Productions and reserves from the Dam can serve substantial part of Ibarapa Community. This is especially so for Idere and Igbo-Ora. Except the connecting pipeline network between Abeokuta and Igbo-Ora, other required structures are in place. The three tiers of government will need to look into these.

In other words, while rain water may retain its vintage position as a source of water to the community (at the interim), with concerted efforts, there could be better sources of water that, if well developed, will meet every need.

Conclusion

Igbo-Ora community is so significant to the adjacent metropolitan Lagos and Abeokuta and Ibadan urbans. Water is not readily available to support lives. The existing Opeki Dam and the entire network of pipe lines are just there for nothing. Boreholes and wells are not developed. Springs, streams and rivers are not common. Rain water that is, the most significant but seasonal, is limit to the quantity that could be harvested and stored. The results of lack of all season water have been:

- Limited production on the farms and in the planting seasons;
- Limited production in the local industries and inadvertently increased cost of production;
- Limited opportunities for recreations and other uses water could be put;
- Members of the community invest so much before they could get enough to satisfy their daily needs;
- Preponderance of water borne diseases and ailments on the entire populace and longevity; and
- Investors in light and heavy industries that would have depended heavily on water and or consume much water do not venture to establish in the region.

Therefore the challenges call for urgent attention. This paper is thus calling on individual philanthropists, Community Development Associations, Local, State and Federal Governments to assist in the provision of water to meet every need. It is not at this age of technological development that a community should depend that solely on rain water.

The region is a good supplier of labour; a reliable source of food supply to the Nigerian Western Urban Centres; and the soil is fertile enough to support all year round agricultural production – cultivation of crops, raising of

birds, grazing of animals and breeding of fish and others - only if there could be adequate supply of water. Suffice it to say that the dwellers are very hardworking, energetic and dependable – very resourceful.

While construction of new dam(s) and rehabilitation of the old one may be so huge investments, boreholes and wells may be constructed and equipped with submersible pumping machines. Waters from the boreholes and wells could be pumped to overhead tanks which will be connected to pipeline networks that will distribute the water to points of consumption – homes, hospitals, schools, industries, farms, recreation centers, hotels and others. The number per area of the community should definitely depend on the population density and the demand. It is essential that planning and forecasting take into cognizance the fast growing population and the extent of the built-up areas, and of course, the consequent expansion of such schemes.

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