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SUSTAINABILITY OF WATER AND SANITATION SYSTEMS

## Sustainable community water supply in Nigeria

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NIGERIA IS THE most populous country in Africa having a total land surface area of 9,941,714 sq.km, with a total population (1991 census) of 88.5m people made up of 26.55m urban and 17.7m semi-urban and 44.25m rural.

It has abundance surface and ground water resources reservoirs, yet the rural population are still grossly lacking in safe water supply. 1991 figures after the IDWSS puts the rural water coverage at 30 per cent, projected to 35 per cent for 1995 and 22 per cent for the year 2000. This low level of rural water supplies results in poor health, especially the health of young children's life having an infant mortality rate of 170 per 1000 live births. Of deaths from infectious diseases, approximately 65 per cent are accounted for by diarrhoeal disease and dysentery, malaria and tetanus, and the majority of these are related to children under five years of age.

The organizational policy for water supply and sanitation in the country is at the 3-tiers of government and at the community level. At the federal level, it is mainly that of policy, followed by state for urban water supply and local government for rural water supply. The local government are directly responsible for the provision of rural water supply.

At present, the Federal Ministry of Water Resources and Rural Development with the assistance of UNICEF is advocating that each state (there are 31 states) should have a functional Rural Water Supply and Sanitation Agency in order to facilitate effective resource mobilization to the communities.

The Status of rural water supply in Nigeria are characterized by:

- Low level of coverage, resulting from relatively weak political commitment.
- Difficult geology strata.
- Inappropriate technology.
- Lack of operation and maintenance of existing facilities.
- Poor workmanship by dubious contractors.
- Lack of sense of ownership by the communities.

In Communities where there has been some community empowerment, communities are now resorting to self empowerment to solve their water supply problem. In some cases, there have been tremendous incentives from Non-Governmental Organization (NGOs). The overall scenario is that communities are more than willing to be involved in solving their own problem. They have realized that government cannot do it alone, and in fact in

Nigeria, provision of water supply for rural communities is often used as a political taboo to get votes and these political promises often are not followed when government gets into power.

The story that follows tells of the present water status in 3 communities in Nigeria, their pains, their struggles and their aspirations.

### Chinene community

Chinene is a small community comprising of a total population of between 6 - 10,000 inhabitants. It is situated in Gwoza Local Government Area of Borno State. It is about 30km from the headquarters (Gwoza LGA). Unlike most of the populace in Borno State, Chinene is basically a Christian community. It has a total of 80 per cent Christian and 20 per cent Muslims. In spite of this, the community exists peacefully, there is a lot of religious tolerance, and all efforts made by the association is a joint venture between Christians and Muslims. Most are peasant farmers in the Lake Chad Basin, growing cowpeas. A small percentage are cattle rearers. At the moment, there exists five functional open wells (out of 11) and 1 1/2 earthdam. The first earthdam is fully completed and another dam is under construction.

### History of water supply

Before 1988, the whole community fetched their domestic water from a river called Bala Iwaza which is at a distance of 4km from the centre of the community. The river usually dried up during the dry season. Another source of water supply is from the hills. Chinene is surrounded by the beautiful undulating Gwoza hills. The scenery is beautiful and peaceful. About 30 per cent of the community live on the terraced hills and the water that flows from the hills usually feeds the community.

However, from 1988 onwards, the period of the dry season seemed to have grown longer and the hills no longer produce sufficient water for them. There was a growing awareness in the community about the need to tackle the acute water shortage problem. There was very little outside help, thus an awareness was raised about self help in the community. The community came together in 1990 and officially registered itself as a non-profitable organisation.

The Chinene Community Association is made up of 15 members all male committee.

It is to be noted that due to a large Hausa cultural background there are no women on the development committee.

Any adult person (male/female) having attained the age of puberty is free to join, for a registration fee of ₦25. An identity card is usually issued to a villager upon registration. Membership of the association is open to non indigenes as well.

### **The water project**

Having formed the association, the association (according to verbal information) wrote many letters to the LGA headquarters and paid many visits to the LGA to aid the community with potable water, but there was no response from the LGA.

The association decided to launch an appeal fund, and held a launching of the Chinene Development Community. The launching raised a total sum of ₦22,000 (US 1,000 dollars). 11 hand dug wells were sunk and only five were found to yield any substantial amount of water. The wells were cement lined. The first earth dam was built by the Community with the help of a Canadian Engineer from the Mennonite Central Committee. The community declared 3 working days for the construction of the earth dam out of 5 working days, i.e. Monday, Tuesday and Wednesday. The first earth dam was completed in seventeen working days. The entire male community came out to work, whilst the women provided food and water to the male labourers.

Money soon ran out and the committee resorted back to the community for some money. An extra eight thousand Naira was raised via Levies and Sale of produce.

### **Levies**

Those who had money and could contribute cash were divided into income groups and were asked to pay according to what they could afford.

### **Sales of produce**

Those who had no money, but had farm produce contributed what they had. These produce were later sold by the committee.

The quality of well water was far from adequate. It is brownish and muddy. The villagers drink the water raw without any filtration.

The community feels it needs more water, and it envisage to build 3 more earth dam (only 1 has been built) and this has yet to prove its point, i.e. it is not fully functional. It stills needs more money and technical expertise. The Canadian Sanitary Engineer has left. WHO is advocating some financial and technical assistance to the community.

### **Water supply status in Otan Ajegbaju Community**

Otan Ajegbaju is a small village within Osun State. It is situated in Ila LGA. Many parts of the sate are well served with potable water by the Local government, but not Otan. Fortunately, the village has produced many highly educated men and have constituted themselves into a

community development club, namely, The Pacesetters Club of Otan Ajegbaju (OAPCS). One of their priorities is to provide water for the whole village. WHO was approached for technical assistance and a site visit to the village provided the following information.

### **Geology**

The state is underlain by metamorphic rocks of the basement complex with outcrop over many parts. Rocks of the basement complex found here are schists, associated with quartzite ridges of the types found in Ilesa area.

### **Population**

It has a population of 88,853 inhabitants.

### **Water supply**

The village has abundant water resources, both surface and ground water, but they are not being adequately harvested for the villagers.

### **Rivers and streams**

Two major rivers were observed to run through the village. The larger river, river Aleremu is voluminous and meanders over a wide area. It is however seasonal and often runs dry during the long dry season. The river is slightly turbid. River Oroki is said by the villagers NEVER to run dry during the dry season and never to overflow its boundary during the rainy season. Both rivers are presently used by the villagers for drinking and other domestic purpose.

### **Spring water from the hills**

The village is surrounded by beautiful undulating hills and from one of these hills flow a spring water that is harvestable. This water was first harvested in 1959 by the Catholic Rev. Father and it serves the convent and some part of the town. The pressure from the breakdown tank is sufficient to climb up a story building without pumping. The rest of the water is fed into a ground clear water tank that serves the village.

At the time of the investigation, the tank (about 5,000 gallons) was found everywhere to be rusty with holes, implying a loss of pressure of the water. This loss in pressure has made it impossible to have an overflow into the ground clear water reservoir, meaning that, the part of the village serviced by the underground tank is no longer served.

It was however observed that the water reservoir from the foot hills has sufficient capacity to serve the whole village.

The water is of very high quality such that it is taken directly without any pre-treatment.

The state government via the Directorate for Food Roads, and Rural Infrastructure have sunk 2 - 3 boreholes, but all are non functional. In addition, there was abundant evidence that the state government had proposed to service the town with treated water from another town.

An incomplete storage reservoir with a half built pump house and generator house beautifies the centre of the town and pipes were found neatly stacked in one section of the town. The only functional water points are from the following sources:

- Privately dug hand dug wells with and without pumps.
- Rainwater harvesting scheme.
- Natural springs.
- Tapping water from the Oke Oluwa hills for the Catholic Convent.

In order for the Otan Ajagbaju Pacesetter Club (OAPSC) to be able to meet their terms of reference of provision of potable water to the whole town, the following line of action were recommended:

- Divide the town into 2 sections.
- Section A can be served with the ground water, utilizing the derelict borehole to the state hospital. Another bore hole can be sunk in the vicinity (verify site through hydrogeological studies). The water from these two boreholes can be distributed on a short term basis via water tanker to the rest of the city, i.e. directly to their houses or into built storage reservoir. Some kind of cost recovery scheme would have to be put in place.
- Section B, can be provided with water from the Oke Oluwa foot hills. A bigger tank should be installed to carry the water and replace with bigger diameter pipes that can service the convent and this part of the city. The necessary repairs works to the ground storage reservoir should be carried out.
- Contractors should be invited to quote for the jobs in 2 and 3.
- There are natural spring water in the state. These should be preserved.

The lesson to be learnt from this community is the determination of the people to help themselves. Till date, not much infrastructure has been put in place, but there are fund raising activities seeking to redress this situation.

### **Agagbe community in Gwer West local government of Benue State**

This community represents one of the poorest in the whole country. A notable feature of this community is its geological characteristics. The geology of the state may be grouped into two, namely:- Metasediments occurring in the Benue and Katsina Ala river valleys and basement complex rocks occurring in higher ground.

The sedimentary formations are rich in limestones, coal and mineral salt. The community has a low population density. Total population of the community is about 73,396 with a population density of 56 sq.km. It is one of the poorest. It was depleted of its population during the slave trade. The villagers live in tiny compounds whose population range from 6 - 30 people most of whom are

illiterate farmers. The state water resources include numerous rivers, streams, lakes, ponds and underground reservoirs. There are many mineral resources in the state most of which are still unknown due to inadequate geological survey. However, from what is known, it is believed that it is impossible to tap ground water via shallow hand dug wells or boreholes, due to the underlying mineral salts. The wells in the community only hold water during the rainy season and run dry during the dry season from December - April. Any attempt to dig further results in salty water. The only alternative is to tap the big rivers. A tributary of river Benue runs through the village i.e. River Apkean. The river has sufficient capacity to be utilized as a water supply reservoir, but it however contains high suspended solids. The villagers normally drink the water from the river untreated. It becomes obvious that these set of people cannot provide potable water for themselves. WHO went to assist the community via a Functional Literacy Programme for the women in 1994. The villagers only agreed to participate in the project only when WHO agreed to supply them with potable water. Getting potable water from a river source is very expensive and funds had to be sourced from another source. After a long search, the European Union came up with the necessary fund of about 5 million Naira. The Scheme consist of an intake -> Water treatment plant (WTP) (WTP consisting of coagulation and flocculation) —> rapid sand filter —> storage reservoir. This is now distributed into four (4) places in the village. The villagers can go to any of the 4 points to get water. The ground tanks are fitted with about 2 taps each.

The WTP runs on diesel and when there is a shortage of fuel, there is concurrently a storage of drinking water. Provision of raw water is being followed closely by health education through the Female Functional Literacy campaign. The plant is still under the supervision of the contractors and after a year and it will be handed over to the communities for operation and maintenance. Luckily within the community, lives a Catholic Reverend Father (Father Hunter) who provides the initiative for community mobilization and also a tremendous amount of technical expertise.

### **Concluding remark**

It will be observed that all these communities except for Agagbe still lack potable water, but they are on their way to achieving their goal. There is still a need for outside assistance in terms of both technical and financial assistance i.e. building earthdams, drilling borehole and harvesting rain water. The major consensus is the realization of these communities that they need to be mobilized themselves in order for them to have sustainable potable water. The dawn of community participation in projects have truly arrived, communities want to help themselves and they must be empowered both technically and financially to achieve their goal of potable water at the rural community level.