29th WEDC International Conference Abuja, Nigeria, 2003

TOWARDS THE MILLENNIUM DEVELOPMENT GOALS

Rural water supply and handpump development in Nigeria

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NIGERIA IS ONE of the largest countries in Africa (1,924,000sq. km in area) and the most populous. The population is at present estimated to be about 120 million with an annual growth rate of 3.2%. The economy has a comparatively low per capita consumption rate. The inadequate water arising from the temporal and spatial distribution of rainfall (about 4000mm in the southern part to less than 500mm in the north) and the low service level of water account for why water borne diseases are prevalent sometime to epidemic scale and food shortages become critical.

In the pre-independence period, provision of domestic water supply was largely through individual and community efforts. The regional governments later got involved with the main concern of developing schemes for urban and semi-urban areas to the neglect of the rural communities. Water Boards or corporations were established for this purpose by the regional governments to provide the services. The drought of the early seventies prompted the intervention of the Federal Government to take a number of actions. This resulted in the establishment of some Federal Agencies. These Agencies include the Federal Ministry of Water Resources (1976), National Water Resources Institute (1977) and the River Basin Development Authorities (RBDAs, 1976). While the Ministry has the responsibility to formulate policies and give advice, the Institute is charged with the responsibility of manpower training and research while the RBDAs are executing agencies providing irrigation water, and domestic water supply to the communities.

The tempo of water supply was raised in 1980 with the preparation for and campaign in favour of the United Nation's International Drinking Water Supply and Sanitation Decade (1981-1990). The goal of this programme was to provide water for all by 1990. The implication of this was that every individual will have at its disposal by 1990, 120 litres/day of water (WHO Standard) for domestic use[1]. However, just before the commencement of this programme, only 22% of the rural and 55% of urban population enjoyed potable water. These figures have increased only marginally. The delivery of water supply systems especially to the Rural Areas in Nigeria has generally been inadequate in relation to desired goals and objectives. Presently about 39% of the rural and 50% of the urban population enjoy portable water[1].

In dealing with the problems of rural water supply and its possible solutions, experts from UN, World Bank and other related organisations postulated that handpump provide the most reliable and adequate means for combating this growing problem. The experts argued that hand pumps installed in wells where groundwater is easily available provide one of the simplest and least costly methods of supplying the rural populations with safe water. The handpump projects of UNDP and the World Bank has extensively documented laboratory and field tests results of 70 different hand pumps models from several countries. Pump development is undertaken in several countries including Nigeria to meet local requirement.

Historical overview of rural water supply development

The history of water supply development dates back to the colonial era when the first ten year plan (1944 - 1956) included in its overall budget about 5.7% of total expenditure for the sector. With this, concrete open wells were constructed under the supervision of Public Works Department (PWD), of the Regional Governments who were responsible for providing safe water to the rural communities. Since independence several National Rural Water Supply Programmes (RWSSP) have been undertaken notably by FGN [NBP, DFRRI, PTF and INAWSSP (on going)]. States, LGAs, World Bank, UNDP and UNICEF among others have also contributed to the development of rural water supply.

In the mid 1970s the World Bank financed Agricultural Development Programme (ADP) pilot projects in 6 States namely Bauchi, Benue, Kano, Plateau, Oyo and Sokoto. Rural Water Supply component assumed a major part of these pilot projects that have now extended to other states of the Federation.

In 1981, UNICEF included rural water supply and sanitation in Nigeria country programme in Imo, Gongola (now Taraba and Adamawa), Kwara, Cross River, Niger and Anambra States. Today, 22 states are benefiting from the programme[2]. From 1989 - 1992, the UNDP operated the RUSAFIYA Project focusing on the local government with perceived advantages of being closer to the communities. Through this programme, the rural water and sanitation sector strategy and action plan was developed.

State and Local Governments were also involved in other rural water supply projects. Other Non Governmental Organizations in addition to other religious bodies, private individuals and corporate multinationals like Shell, Mobil, Chevron have contributed in no small way to rural water supply both in their areas of operation and some other accessible parts of the country.

Programmes initiated by the Government of the Federation include the National Borehole Programme in 1981. This programme was planned and implemented by the then Federal Department of Water Resources, to supply water through a motorized system of boreholes to rural areas or communities.

In 1986 the Federal Government established the Directorate of Foods, Roads and Rural Infrastructure (DFRRI), with a policy of intensive development of rural areas. DFRRI project, in contrast to the national borehole programme had the community participation and involvement as a strategy.

The most recent national water supply programme is that of the Petroleum (Special) Trust Fund. Under this project, water supply and sanitation encompass a range of development project concerned with the provision of potable water for domestic consumption and the improvement of personal and community sanitation. The intervention in the water supply sector include the effective rehabilitation of all existing boreholes and massive drilling of new ones in rural and semi-urban areas and the installation of hand pumps or similar devices such as windmills, to provide potable water for both human and animal consumption.

Highlights of local handpump development

As at 1984, the Indian Mark II handpump was already being widely used in Nigeria, even though it did not fulfill the VLOM concepts. In this same year, the World Bank contacted the Federal Ministry of Water Resources about Global Rural Water Supply Handpump Testing project. In order to encourage local manufacture of handpump in Nigeria, the FMWR embarked on fabrication of a handpump similar to the Indian Mark II with a design modification to make it potentially VLOM satisfactory.

(a) DFRRI (1986 - 1992), DFRRI with the FMWR jointly manufactured the prototype Indian Mark II (called RUWATSAN Handpump). Eight of these prototypes along with other imported pumps were put out to field testing in mid 1987, under the sponsorship and participation of six organizations namely FDWR, DFRRI, FACU, BASIRDA, UNDP/World Bank and UNICEF[3]. Five different types of handpump including foreign and locally made pumps were selected and tested. These were the standard India Mark II, India Mark III, Ruwatsan, Afridev and Volanta.

The overall objective of the pilot field testing project was to provide a basis for widespread and sustainable rural water supply in Nigeria by (1) identifying the type(s) of handpumps that are best suited for community based maintenance and local manufacture (2) assisting local manufacturers to make them and (3) developing a maintenance system that will sustain rural water supply systems.

After the field testing, Ruwatsan and Afridev handpumps were selected for Nigerian deep wells and recommended for local manufacture and procurement by all projects in Nigeria[3]. When manufactured in Nigeria, it would on the long term ensure availability of spare parts and building up industrial capacity in the country. The Ruwatsan and Afridev handpumps were later named Ruwatsan 1 and Ruwatsan 2 respectively. It was recommended that local manufacturers should be supported continuously on production engineering, quality control, and bulk purchase orders so as to create a stable in-country handpump manufacturing and ancillary. To locate manufacturers with the necessary machinery and skill as well as seriousness in the country, a nation wide survey was carried out by FMWR & RD and UNDP/ World Bank to identify and pre-qualify small scale industrial units capable of manufacturing handpumps and components.

Factories were inspected in 14 States of which 3 were found to be appropriate and willing to manufacture handpumps. The three were given order to manufacture 10 prototypes of Ruwatsan II handpump for the UNDP/ World Bank programme. The production of both Ruwatsan I and II could not be sustained inspite of a substantial need for handpumps in the country. There was no order forthcoming from the Federal or State Government, UNDP/World Bank RWS programme or UNICEF. Rather UNICEF and DFRRI continued with the importation of handpumps. This was a clear case of under-subscription by the very sponsors who promoted local handpump production in the first place.

(b) UNICEF evolved a strategy to support the manufacture of handpumps locally and to support its large scale production through direct purchases. UNICEF was cautious to ensure that a critical level of purchase is made to ensure quality production of handpumps at the same time promote purchase of local handpumps by Federal Agencies, State Government and Local Government Areas. Even communities were contacted and encouraged throughout the WATSAN project to purchase handpumps from approved handpump manufacturers. However, this effort met with constraints:

(i) The three manufacturers involved in the early attempts were shy of committing more resources particularly in the absence of firm orders in respectable quantities.
(ii) There was no standardization of specifications or quality controls in place at the time which could be built upon. The draft specifications were based on early specifications for both Afridev and the India Mark III and were not workable if the manufacturers wanted to produce pumps for export.

By mid 1995 a new company Unipumps Nigeria Ltd. (Lagos) agreed with UNICEF at the early stage to import partially processed raw material/ components from their parent company in India which would be fabricated into handpumps using local labour in Lagos[2]. This decision was based on a market survey in Nigeria which established that there was no consistently reliable source of raw material to backup the handpump production at the time. This strategy was faced with problem of inability to clear the consignment of materials from the docks. This had a multiplier effect which verged on calamity. Because of non availability of materials, order could not be completed on time, which meant that payment could not be made.

(c) The PTF Rural Water Supply Programme (1997 - 2000) on rural water supply encouraged local manufacturer of handpump in Nigeria. The PTF project wholly patronized local manufacturers of pumps and associated spares. Three manufacturers were assessed for patronage viz: Nigerian Foundries Ltd., (Lagos), M & W Pumps (Nig) Ltd., (Maiduguri) and Unipumps Ltd., (Lagos). Two were selected. The National Water Resources Institute was assigned responsibility for Handpump Quality Control and Training of trainers on Installation and Maintenance. Two pump types RI & RII were approved for local manufacture and a total of 2264 handpumps were produced. It is important to note that:

The Ruwatsan II handpumps were fabricated from raw material sourced in Nigerian markets. The manufacturing company (M & W, Ltd.) increased manufacturing capacity, equipment and facilities, as a result of patronage by PTF. It set up its galvanizing plant. The quality of its handpumps was also growing steadily. Equally though Unipumps produced Ruwatsan I from imported pre-fabricated components, there were plans to increase their machinery to produce hand pumps from locally sourced materials given continuous patronage.

Overall PTF encouraged local manufacture of handpumps by supporting and patronizing the local manufacturers in the purchase of handpumps. Field inspection of installed pumps revealed over 80% success. Early failures were as result of wrong installation by contractors.

(d) The PTF was scraped in 2000 and the responsibility for rural water supply was transferred to the Federal Ministry of Water Resources. It came up with the Improved National Access to Water Supply and Sanitation Programme. The FMWR engaged three local manufacturers to supply handpumps for its rural water scheme. The quantity handpumps demanded by this programme was beyond the production capacity of the selected local manufacturer, so a large portion of the supply was imported. However, the Ministry collaborated with the UNICEF for third party inspection to ensure standardization and quality assurance.

To further encourage the local production of handpump, a process of re-evaluation of existing and certification of new local manufacturers as well as capacity building for third party inspection was carried out by the Swiss Centre for Development Corporation in Technology and Management (SKAT) on request by UNICEF from 14 April, 2002 to 3 May, 2002[4]. It is also believed that with the current democratic government providing an enabling environment for increased investment, many local pump manufacturers and foreign investors interested in local manufacturing will take advantage of these opportunities.

Constraints to rural water supply and handpump development

It is estimated that less than 50% water points (including handpumps) are functioning at any point in time. The handpump types are many - India Mark I, Ruwatsan I & II, Tara, Monopumps etc. It is important to know quantity, types of handpumps and their performance in the field. Also many projects have failed because:

(a) There is general lack of good quality and consistent data to guide systematic planning, implementation, monitoring and programme evaluation. Where data are available there are discrepancies from competing sources/ interests at national, state, LGA levels.

(b) Discontinuity in programmes (DFRRI, PTF etc) due to changes in government and weak policy has grossly affected completion of rural water supply projects. There is problem of reliable data on extent and number of handpumps installed which makes planning with background data impossible.

(c) Some of the programmes had monitoring schemes but implementation of programme monitoring is often hampered by inadequate staff strength and skills, weak institutional mechanism, logistical and budget constraint; due to inadequate resources and framework, there is often no feedback on monitoring and evaluation findings.

(d) Rural water supply programme is over politicized.

The way forward

For a self sustaining handpumps manufacturing programme in Nigeria which will support and be integral with low cost rural water supply programme:

- A thorough inventory of different pump types existing in the field and their functionality should be determined. This will provide database for the development of the local industry and sustainability of the Rural Water Supply in Nigeria.

- The Federal, State and Local Government should patronize the local manufacturers thus support the local industry and its expansion. This will create jobs and reduce poverty.
- Considering the size of the country, more local manufacturers should be identified, evaluated and encouraged to set up operations. Some can produce standard component parts for others and not necessarily manufacturing the entire pump.
- Existing manufacturers should establish sales network for their pumps, spares and link with local maintenance mechanics, and collaborate with drilling and other private sector companies to provide services directly to communities, states and local government areas.

Conclusion

This paper has reviewed rural water supply and handpump development efforts in the half century decades and concludes that:

- Handpump water supply is still one of the best options for rural water supply in Nigeria.
- The rural water supply development efforts had not been consistent, even within the same government. Policy implementation has no satisfactory results.
- Inconsistency in the development of handpump for rural water supply in the past is due mainly to interruptions in governance.

However, there is growing hope that the onset of democratic governance is providing an enabling environment for partnership between government, external support agencies, and the private sector in shaping a more consistent framework for sustainable local handpump development programme that will improve rural water supply effectively and efficiently.

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Abbreviation

RWSSP - Rural Water Supply and Sanitation Programme
FGN - Federal Government of Nigeria
NBP - National Borehole Programme
DFRRI - Directorate of Foods, Roads and Rural Infrastructure
PTF - Petroleum Trust Fund
INAWSSP - Improved National Access to Water Supply and Sanitation Programme
LGA - Local Government Area
VLOM - Village Level Operation and Maintenance
FMWR - Federal Ministry of Water Resources
FDWR - Federal Department of Water Resources
FACU - Federal Agricultural Coordinating Unit
BASIRDA - Bauchi State Integrated Rural Development Authority
RD - Rural Development
RWS - Rural Water Supply

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