

*Full Length Research Paper*

# Evaluation of the institutional arrangements for rural water supply in Enugu State, Nigeria

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Received 15 November, 2016; Accepted 4 January, 2017

**This paper presents a qualitative assessment of the institutional arrangements for public water supply to rural communities of the Enugu State, Nigeria, in order to isolate strategies that can enhance institutional strengthening and improve service delivery in the area. The data used were obtained through questionnaire surveys, field observations and from records in the states agencies responsible for public water supplies. The data generated were analyzed through the use of descriptive statistical tools. The results of the study revealed the strengths and weaknesses of the institutional arrangements currently in use in the area. The principal and subsidiary agencies for public water supply have clear policies, functions, roles, responsibilities and programmes for rural water supplies; however, the rural population's access to potable water remains low in the area due largely to a variety of factors such as low investments, high recurrent and maintenance costs, over-aged water infrastructures, lack of political will, non-availability of fund, inadequate technology and institutional weaknesses. Over 85.6% of the water supply schemes have failed completely or partially. Only 14.4% of the schemes are functional; 83.3% of non-functional schemes are suffering from major breakdowns; 86.78% of the population is not served and 18 schemes have exceeded their estimated life span of 20 years. The implications of these findings were x-rayed. The way forward is to reform and strengthen the current institutional arrangements, adopt new management strategies, rehabilitate dysfunctional infrastructure, improve coverage and distribute water infrastructure equitably.**

**Key words:** Institutional strengthening, institutional arrangements, reforms, rural communities, rural water supply, Nigeria.

## INTRODUCTION

Institutional framework for water supply refer to the set of formal organizational structures, laws, policies, guidelines, regulations, as well as agencies engaged in the planning, developing and managing water supply systems in an area (Rees, 2006). According to Saleth and Dinar (2004), such a framework is the prerequisite

for any sustainable development and management of public water supply systems; as it shows the capacity possessed by organizations to carry out the task assigned to it. A well-balanced arrangement for public water supplies is the best assurance that the right quantity and quality of water will be delivered to water

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users (including the ecosystems), both now and in future and that the people will continue to live in a healthy environment (Ostrom, 1990).

Saleth (2008) observed that over the decades, humanity has learnt that water resources, although finite, must keep satisfying a variety of user demands (such as water supply for domestic needs, etc) and that the water must be sourced. They have also learnt that there are different approaches for sourcing water and that some approaches are more cost effective than or have more advantages over the others. The cultural, historical, physical and socio-economic conditions of a country dictate which specific approaches must take priority and hence determine the preferred institutional arrangements. Each institutional arrangement must however require a specific mandate, organizational structure and procedures as well as specific technical expertise (Gbadegesin and Olorundemi, 2007).

Ezenwanji (2012), noted that the organizational structure and the administrative procedures to implement water service delivery responsibilities in Africa is very much affected by the characteristics of the sub-sectors of the institutional frameworks and the functions they perform. The sub-sectors typically concern themselves with functions that are relatively distinct (such as construction, operation and maintenance of water infrastructure) and require specific expertise. Goni (2006) noted that institutional arrangements in the region differ between countries, as well as over time.

Although, the Millennium Development Goal Summit Report (1) indicates that appreciable progress has been made in attaining the MDG 7 target of reducing by half the proportion of people without sustainable access to safe drinking water by 2015 in many countries, recent findings clearly indicate that many countries in Africa still remain with limited access to potable water supplies (UNICEF, 2015). In many parts of Africa, especially sub-Saharan Africa, water supplies are inadequate and dwindling (Obeta, 2013). Adah and Abok (2013) noted that sub-Saharan Africa is lagging behind in the attainment of MDG as 34 million people still lack access to safe drinking water. The proportion of African population who had access to safe drinking water accounted for only 60% by 2010, an increase of 11% compared with the situation in 1990 (Obeta and Chukwu, 2013). In 2015, 663 million people in the continent still lack access to improved drinking water sources (UNICEF, 2015). This is inspite of the large array of institutions and agencies responsible for ensuring that government targets in the water supply sector are met in the region.

Nigeria lags behind many African countries such as Serra Leone, Rwanda and Botswana in access to safe drinking water (UNICEF, 2015). These countries have met the 2015 Millennium Development Goal's target of halving the proportion of its people with regular access to potable water. In 2013, 71% of the Rwanda's population

had adequate access to clean water (UNICEF, 2012). But in Nigeria potable water remains a dire need in almost all communities and sectors. Indeed, Nigeria is still one of a handful of countries around the world where access to potable water is actually falling rather than rising (Bob-Duru, 2007; Obeta, 2013). For instance, 37% of the nation's population had regular access to potable water in 1990 (Uboh and Etim 2007). In 2003, the percentage of the population with regular access to potable water declined to 32% and again to 28% in 2012 (Obeta and Chukwu, 2013). Currently, 90 million Nigerians are without safe drinking water and 130,000 under five children die annually from preventable and treatable water related diseases (Nwankwo, 2014).

In our study area (Enugu State) access to potable water is an arduous task. The state is predominately rural. About 80% of the population lives in rural areas. For a sizable proportion of the population, the major sources of water are unprotected wells, streams, ponds, private boreholes and harvested rain water (Figures 1 and 2). These sources are open to contamination by natural and anthropogenic factors, such as defecations, careless waste disposal practices, livestock, floods, etc. (Nwankwo, 2014). The problems of limited access to potable water in the area create the need for in depth studies to investigate the institutional arrangements for rural water supply in the state in order to isolate the strategies which can strengthen the agencies and improve service delivery of the existing supply schemes

Cleaver (2001) and WHO (2011), emphasized the need to identify specific challenges facing public water supply, especially in developing countries, and to strengthen policy-making, so that safe drinking water, can be brought to all urban and rural dwellers. Akpomunje (2010) and Peter (2010) shared this view and stressed that water is fundamental to human development and well-being. They noted that access to potable water is critical and essential for the sustenance of socio-economic growth and development. The objectives of this work therefore are to describe, analyze and evaluate the institutional arrangements for rural water supply in Enugu State of Nigeria, with a view to isolating their strengths and weaknesses as well as the strategies which can improve service delivery in the rural water supply sector of the area. The findings of this work, in our view, will contribute to the knowledge base for future research and development of water supply systems in the state. In addition, finding lasting solutions to the rural water supply deficiencies in state is a crucial step in setting the stage for sustainable development in most sectors of the rural economy as well as in improving the peoples well-being, and indeed, for the successful implementation of the post-2015 rural development agenda.

### **Area of study**

Enugu State is located in Southeastern Nigeria



**Figure 1.** Abonyi River, near Ikem. Many River bank. Residents depend on this stream for all their water needs.



**Figure 2.** Ajalli River near Iwollo. Most communities in Ezeagu. LGA depend on this stream for their water needs.

approximately between latitudes 05.55°N and 07.08°N and longitudes 06.35°E and 07.55°E (Figure 3). The state has an area of 9,102 square miles or 14,563.2 km<sup>2</sup>, and a 2014 projected population of 4.7 million, 80.2% of which live in the rural areas (Nwankwo, 2014). The climate is tropical with high temperatures and high humidity as well as marked wet and dry seasons, though there are variations between north and south. Precipitation varies widely in both time and space, ranging from less than 850 mm per annum in the extreme north to 1050 mm in the south (Oformata, 2002).

The state is drained by numerous rivers, principally the Ebonyi, Adada, Ajali, Ivo and their numerous tributaries.

Many of the tributaries are seasonal. The vegetation varies mainly with the rainfall and with topography. Natural vegetation is denser in the south and in the valleys and sparse in the north and at the top of the highlands (Nzeadibe and Ajaero, 2010). Generally, the rural areas have similar physical and socio-economic characteristics. For instance, many of the rural residents have no easily accessible, nearby, clean or hygienic water sources. Sources of such water vary widely from direct rainfall to water from runoffs, rivers, streams, boreholes, wells, and seepage. Many suffer from avoidable water related diseases (Mozie, 2011). Despite a process of industrialization extending to the creation of the state in 1986, agriculture remains the fundamental economic activity in all the local government areas. The leading economic crop is the oil palm which is grown in every part of the state. Cassava, yam, rice and maize are the most important food crops. The average life expectancy in the mid 1990s was 47 for men and 49 for females.

## METHODOLOGY

The data used in this study were derived mainly through oral interviews, personal observations and from records in states agencies for rural water supplies. First, an elaborate field survey of the study area was carried out; we visited all the three rural water supply zones in the state at Enugu, Nsukka, and Udi to extract useful information from official records, observe existing water supply sources, equipment as well as to interview the principal officers of the state zonal water supply units. The three zonal water engineers at Udi, Nsukka and Enugu were interviewed; they provided relevant information on the contemporary situations of water supply services in their respective zones. In addition, a total of 15 rural water supply schemes were sampled with detailed investigations. The choice of the schemes depends on the distance from a previously chosen one in the locality, the wish of the owner(s) and availability for study. The water supply schemes had a total of 85 water distribution points/public taps. The water supply schemes are located in sampled communities in Figure 2.

Three focus group discussions (FGD) were conducted, one in each of the rural three water supply zones. In each of the FGD, 9 participants, comprising, the zonal water engineer, three borehole managers, three officials of the community water supply committees and two women leaders were involved. Participants discussed a wide range of issues; including, how to improve the contemporary water delivery services and how to mobilize the communities towards the realization of the objectives of the rural water supply schemes. The data collected from the aforementioned sources were analyzed through the use of various descriptive statistical tools-percentages, means, standard deviations, etc. The computations were done through the use of the statistical package for the social sciences (SPSS) Version 20.

## RESULTS AND DISCUSSION

### Institutions and NGOs involved in public water supplies

#### *The State Ministry of Public Utilities*

The State Ministry of Public Utilities is responsible for

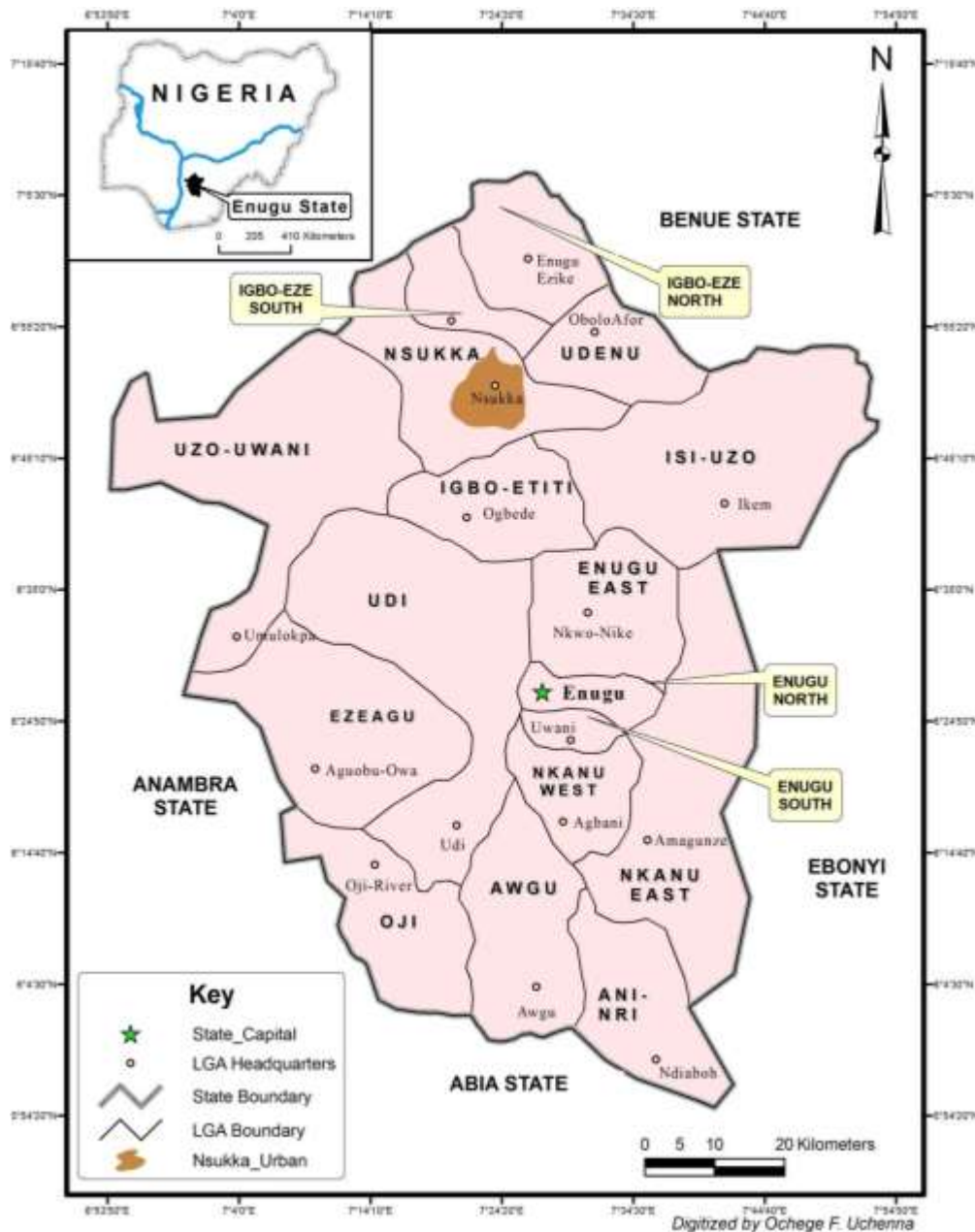


Figure 3. Map of Enugu State showing the Local Government Areas (GIS Unit, Department of Geography, University of Nigeria, Nsukka).

implementation of water resource policies in the state. However, the ministry has no direct involvement in rural water supply services other than licensing and registering non-governmental agencies involved in public water supplies.

**The Enugu State Water Corporation (ESWC)**

The ESWC has the overall responsibility for urban and

rural water supply in the state. This institution was established in 1997 and charged to provide adequate, sustainable water supply for improved personal, household and community wellbeing. Prior to the 1960s, the responsibilities for water resources, in our study area, were divided among: (1) Ministry of Agriculture, for irrigation and rural water supplies to farming communities; (2) Ministry of Public Works, for rural water supply, as well as for the installation maintenance of supply facilities; (3) Ministry of Health, for aspects

relating to hygiene.

In December 1963, a Water Bill to govern public water distribution and management was passed by the Eastern Nigerian House of Assembly. The bill provided for the establishment of a regional water corporation to develop/provide adequate and safe water to the people of the region. This law of December 1963 profoundly modified the water policy strategy in Eastern Nigeria, from where the state was carved out in 1986.

For instance, the 1963 Water Bill, according to Obeta (2009) and Ezenwanji (2012):

- (1) Led to the establishment of a regional water corporation to develop and provide adequate household water to the people (urban and rural);
- (2) Outlined a number of general guidelines/principles, concerning the operations of the water corporation, which at the time was quite innovative;
- (3) Established legislation and regulations for pollution control, initiated innovative water management policies and established the institutional structure for water resources development within the region.

The 1963 Water Act brought considerable improvement in water resources development in our area of study (Obeta, 2013). The provisions of this act were however, repealed by Edict No. 16 of 1978, which established the Anambra State Water Corporation to develop, provide, conserve and distribute water (in the state) for public, domestic and industrial purposes. Following the creation of the old Enugu States from Anambra, the Enugu State Water Corporation came into being. Currently, the State Water Corporation has three rural water supply zones, with headquarters at Udi, 9th mile Corner (Ngwo) and Nsukka. Each of these zones maintains a number of rural water supply schemes that provide potable water to the rural communities.

### **The functions of the Enugu State Water Corporation**

This institution was established in January 1997 as a public corporation having perpetual succession and a common seal which may sue and be sued in its corporate name and hold and dispose of real or other property in any manner whatsoever for the purpose of carrying out the duties lay down by Edict No. 1 of 1997 (Obeta and Chukwu, 2013). Edict No. 1 of 1997 which set up this corporation assigned a dual role to it, namely:

- (1) The main role is to develop, provide, conserve and distribute water in the state for domestic and other purposes at the most minimal cost.
- (2) The corporation was equally assigned subsidiary water-supply related duties, such as to: (a) establish, operate and maintain public water supply facilities; (b) collect and monies due to the corporation such as the

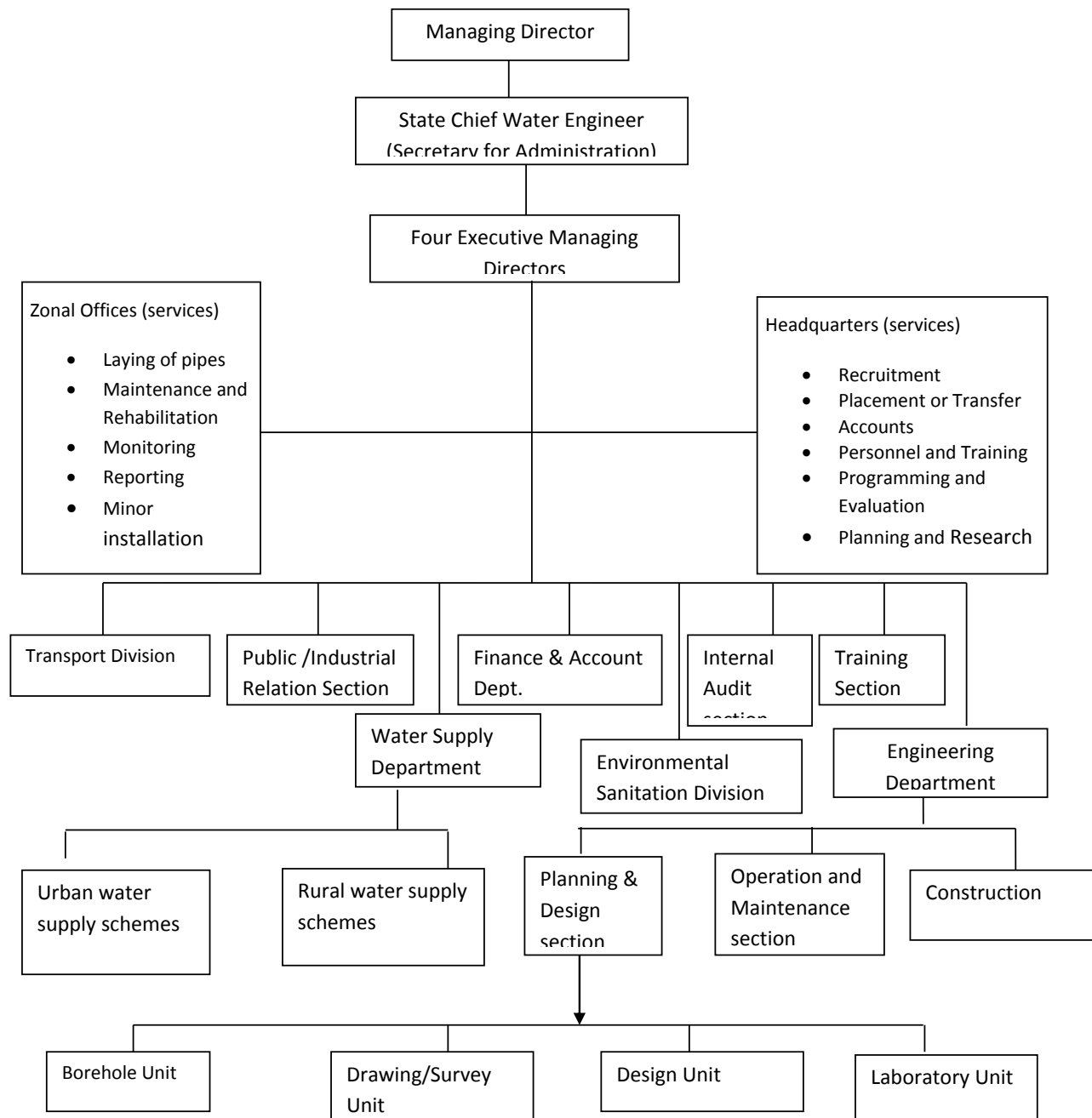
monies from budgetary allocations and discharge debts own to the corporation; (c) sign, accept, negotiate, endorse and receive any negotiable instrument on behalf of the corporation; (d) authorize the disposal of securities of any kind belonging to the corporation; (e) open and operate current, deposit or credit accounts on behalf of the corporation at approved banks or financial institution; (f) assist in negotiating and obtaining loans on behalf of the corporation and in determining in the nature and conditions of such loans; (g) design, build, manage and maintain a network of water supply facilities in the state; (h) compile priority lists of communities in need of water supply facilities and to build or provide same; (i) develop technical standards and preserve the environment; (j) initiate and carry out researches on fields that are related to their activities such as water pollution, rainwater harvestation, and cost effective water supply strategies; (k) prepare and publish audited annual accounts of the corporation; (l) undertake sector planning, coordination and recommend, at the request of the state government, water supply projects for donor funding; (m) provide guidance and technical assistance to suppliers in the private sector; (n) review from time to time, the status of water supply schemes and recommend appropriate actions to the state government.

The various roles assigned to the water corporation are necessary and in keeping with the global policy of providing, to the best possible extent, all population groups with access to safe and adequate drinking water supply and adequate means of sanitation. However, our findings revealed that many of the roles are not receiving adequate attention at present. For instance, the corporation is yet to provide regular and efficient water supplies to the people; and extend services to many deserving areas.

### **The management structure of Enugu State Water Corporation**

The edict, which established the new Enugu State Water Corporation (Edict No. 1 of 1997) raised the status of the corporation to a self-accounting and self-sustaining public corporation. The edit stated specifically that the corporation will be headed by managing director who is empowered to disburse funds without recourse to any higher authority. The present management structure of the corporation is as shown in Figure 4.

As shown in Figure 4, the Enugu State Water Corporation is headed by a managing director, who according to Edict No. 1 of 1997 must be a professional water engineer of very high standing. The managing director is charged with carrying out the executive and administrative work necessary to enable the corporation carry out the duties and functions assigned to it. The managing director, in addition, is promote and encourage



**Figure 4.** Management structure of the Enugu State Water Corporation (Enugu State Water Corporation, Headquarters Enugu, 2015).

the development of efficient service delivery programmes within the state, and where necessary, coordinate the activities of donor agencies involved in water supplies in order to active maximum benefit and economy of supply services to the public. The managing director is assisted in his administrative and executive functions by the states chief water engineer who is also the secretary for administration. Apart from discharging his statutory functions, the secretary, in addition, carry out directives

(usually water supply-related) from the ministry of public utilities. The state chief water engineer is assisted by four executive managing directors who are also professional engineers (at present only 2 are in the service of the corporation).

The State Water Corporation is, for purposes of efficiency and operational effectiveness, sub-divided into two major divisions, namely: the division responsible for urban water supplies and another section responsible for



rural water supplies. The division responsible for rural water supplies is in addition, sub-divided into zones with headquarters at Nsukka, Udi and 9th mile corner (Ngwo). Each of the zonal headquarters is headed by a zonal water engineer, who according to Edict No. 1 of 1997 must also be a professional engineer with considerable experience. The state water corporation headquarters, at Enugu is empowered to carry out a number of very strategic functions, which as shown in Figure 1, include recruitment, placement and transfer, accounts, personnel and training, programming and evaluations, planning and research as well as major administrative, managerial and technical functions.

The zonal headquarters, on the other hand are charged with carrying out less strategic functions, such as laying of pipes, routine maintenance and rehabilitation, monitoring reporting and minor installations. In addition, the zonal water engineer oversees the technical and administrative officers and workers of the zonal. In plain terms, the zonal water engineer is at the head of the zonal administration. He is responsible to the corporation for overall administration in terms of reports management of zonal resources, recommendations, requisitions, zonal stores and statistics.

Finally, the zonal water engineer coordinates and oversees a number of rural water supply schemes otherwise called rural water supply centers. These rural water supply centers are charged with the responsibility of supplying water to the various autonomous rural communities within the area of operation-usually on local government basis. The rural water supply centre is headed by a centre coordinator who oversees the activities of the technical staff under his unit. The local government councils and communities (128 at present) have water committees whose duties are to handle minor repairs and serve as a link between the communities and the zonal water corporation. The communities also carry out surveys of existing facilities or facilities required to meet the consumption and demand of water supply in their areas. They also assist to formulate proposals and prepare estimates for meeting future water demands. The duties and functions of the other units are as shown in Figure 4.

#### **Finance and accounts department**

This department, headed by a financial controller, oversees all finance related activities of the corporation. It operates three main sections, namely:

- (a) Financial accounting section is responsible for receipt expenditure on funds, ledger and financial accounts, staff claims, zonal accounts, payroll and pensions;
- (b) Assets and project costing section deals with assets and stores record, project costing, budgets and budgetary controls, and physical stores;
- (c) Commercial section is responsible for billing,

investments, etc.

#### **Personnel/Establishment section**

This section deals with all establishment matters such as new appointments, staff on leave, in-service training, resignations, terminations, dismissals, retirements, pensions, etc.

#### **Training section**

This section organizes short term training courses for the corporation's staff, such as craftsmen-plumbers, fitters, plant operators' security and other department of staff. This section also organizes trade tests for the junior technical staff of the corporation.

#### **Engineering department**

This department is made up of three sections, namely; operation and maintenance, planning and design and the construction sections. The operation and maintenance section oversees all matters related to the design and construction of water infrastructures, laying of pipes, installations, pipeline extensions, monitoring and supervision, and ensuring quality standards in service delivery, etc. The planning and design section on the other hand is made up of the design unit, the borehole units, the drawing/survey unit and the laboratory unit. The borehole unit is in charge of drilling borehole and installation of pumps. The design unit prepares structural details while the laboratory unit is responsible for testing water meant for human consumption. The engineering department is probably the most important unit in the state water corporation. The department is at present, headed by a professional water engineer.

#### **Environmental sanitation division**

The functions and duties of this division include sewage, drainage, public health, sanitary inspection, pollution control, etc.

#### **Internal audit section**

The internal audit detects and tackles the incidents of fraud, forgery and embezzlement, especially those in which staff is involved. In addition, this section pre-audits salaries and wages, contractor's bills and periodically tours zonal offices of the corporation on cash surveys.

#### **Public/Industrial relations section**

This section handles all preparation of press releases,

advertisements, and briefings, while the remaining departments (legal units, transport division, and security section) carry out essential supportive duties and services that are necessary for the realization of the overall objectives of the state water corporation.

### **The Governing Board of the State Water Corporation**

Edict No. 1 of 1997, which set-up the state water corporation also recommends that a governing board for the corporation be constituted as follows: (i) The commissioner for public utilities or his representative chairman; (ii) Director general, Ministry of Public Utilities-member; (iii) General manager, Enugu State Water Corporation-member; (iv) Chief engineer, Enugu State Water Corporation-member; (v) A member representing the interest of consumers (presently none has been appointed).

According to Edict no. 1 of 1997, the governing board shall ensure that the pre-set performance criteria were met and that the corporation meets its overriding objectives. In addition, the board shall perform the following functions:

- (1) Advise the ministry (of public utilities) on suitable management systems for potable water supplies;
- (2) Advise the ministry on suitable arrangement for disbursement of available funds end-users;
- (3) Examine existing laws governing the operation and management of water supply schemes and advise the ministry on necessary amendments.
- (4) Consider and approve all expenditures exceeding fifty thousand naira (#50,000). The board shall, in the performance of its functions, have regard to: (a) any general policies of the government notified to it by the commissioner of public utilities; or (b) any general or specific directives given by the commissioner.

In the performance of its functions, the board is required to establish and maintain a system of coordination, cooperation and consultation with other bodies, within or outside Enugu State, which have similar or related functions and the board was dissolved in August 2010 and to date, is yet to be reconstituted.

### **NGOs INVOLVED IN RURAL WATER SUPPLY INSTITUTIONS**

A variety of multi- and bilateral organizations and donors, and NGOs support and develop water supply schemes and provide services in the area. Many of these organizations also invest in capacity building of key stakeholders to strengthen the water supply sector and improve service delivery in the area. Currently, these subsidiary rural water supply institutions operate in the

area:

- (1) National Water Rehabilitation Project (NWRP);
- (2) African Development Bank (ADB) Assisted Rural Water Supply Programme;
- (3) Petroleum Trust Fund (PTF) Assisted Rural Water Supply Programme;
- (4) Directorate of Food, Roads and Rural Infrastructure (DFRRI) Rural Water Supply Project; and
- (5) UNICEF, UNDP and World Bank-Assisted Rural Water Supply Projects.

NWRP intervenes to increase the supply of potable water in the study areas by rehabilitating dysfunctional water schemes in order to restore them to designed capacities. NWRP has successfully rehabilitated 18 rural water supply schemes spread across 8 LGAs in the study area prior to the year 2005.

ADB is also involved in rural water supply development in the study area. This agency assists through the procurement of operational equipment, institutional strengthening and sponsorship of rural water supply projects. Findings revealed that ADB has assisted in the pipeline extension of 5 schemes spread across 5 LGAs in the study area.

PTF was established several decades ago (1998) to halt infrastructural decay and accelerate the speed of rural development in Nigeria. Like the NWRP, PTF also assist in the procurement of operational equipment, institutional strengthening and in the drilling of hand pump boreholes. DFRRI was established in 1986 to develop rural feeder roads, water supply projects as well as to stimulate economic and other activities necessary for improved quality of life in rural areas. This agency developed 32 hand pumps (none is functional at present) pumps, equipped with boreholes in Ani Nri, Nkanu, Ezeagu and Uzouwani LGAs. Finally, UNICEF, UNDP and the World Bank also assist in improving the living standards of the rural communities in the area through the development of rural water supply sources. These agencies have sponsored water projects in Udi, Igbo Eze and Udenu LGAs of the study area.

### **EVALUATION OF THE INSTITUTIONS INVOLVED IN PUBLIC WATER SUPPLY IN THE STATE**

All the public institutions involved in rural water supply in the study area have clear functions, responsibilities and programmes for rural water supply in the study area. The functions, roles and responsibilities of the agencies are clearly defined and are essential. The functional relationships between and within agencies are highlighted. However, there are several disturbing weaknesses in the current arrangements which, in our view, are holding back progress in the states rural water supply sector. These observed weaknesses are briefly



discussed as the following.

Firstly, the current structure of the State Water Corporation, illustrated in Figure 1, is cumbersome and perceived as ineffective even by the officials of the state water corporation.

For instance, all the zonal water engineers agreed that reporting lines are long and tortuous, and that numerous support-services are often shared by two or more sections. Presently, a simple request for the replacement of faulty equipment, say, the simple pressure filter, in a rural water supply center such as Ikpamodo (Igbo-Eze North L.G.A) at the lower end of the structural hierarchy must pass through 5 line officers before approval can be given. Naturally, this causes delays and avoidable hardships. This contrasts sharply with the position in private water supply schemes, where the field officer can report directly to the chief executive and get faulty parts repaired in hours.

Secondly, our investigations revealed that the current accounting systems within the ESWC provide little information to support a critical analysis of the corporation's operations. For instance, there is no up-to-date revenue account. Accounts are kept on a cash basis, and the accounting system uses very broad headings, which involve a great deal of aggregation. Items like administrative', 'electrical and mechanical' costs frequently cover several functions, and there is no simple way of identifying the specific expenditures attributable to specific aspects of rural water supply. In such a situation, a researcher cannot tell how much the corporation spends on routine and periodic maintenance costs; the breakdown of costs between overhead-labour, equipment, repairs, pipeline extension and construction. Such poor accounting systems make it difficult, if not impossible, for even the managing director to establish consistent spending priorities.

Thirdly, our investigations revealed that there is a dearth of effective management information system at the zonal headquarters of the Enugu State water corporation. For instance, none of the field officials of the zonal water corporation interviewed knew the annual budgetary allocation released to his zone in the 2014/2015 fiscal year. None too, knew the exact amount which accrues to the zone as revenue from rural water supplies, and only a mere 11% had any idea of the total population which the installed supply facilities in their area of operation are supposed to serve. These features are characteristics of agencies which deliver poor quality services, which face no market discipline/competition, and have poorly motivated managers who are not held accountable for results.

Fourthly, massive failures, frequent breakdowns in the supply system and general under performance of potable water supply schemes were reported in the field. Table 1 provides summary information on the existing schemes, their functional status and other related information in the three rural water zones in the study area. The reality, as shown in Table 1, is that the number of functional water

schemes in the study area is very low (14.4%). The state government and the subsidiary water providers allowed many water schemes to go bad. Why is this so? The zonal water engineers attributed the situation to a variety of factors, principally paucity of funds; 'we lack operation and maintenance funds' as a result 'the physical components of the schemes cannot be regularly checked, maintained and repaired' they complained. In addition, many of the schemes are old and experience frequent technical problems. The schemes are also unevenly distributed, with 65.15% (86 out 132) located in 5, central, water deficient LGAs.

Ordinarily with the high number of water supply schemes dotting the landscape of the study communities, one would expect that at least 80% of the residents should have adequate/regular access to safe water supplies, but findings showed that majority of the respondents (83.3%) depend on alternative sources, particularly, private boreholes, water vendors, streams, etc.

Fifthly, the state government and other service providers in the area tend to focus more on project development than on the functioning throughout the entire life cycle of water supply schemes. Findings show that rarely do the government and other providers set aside resources for the operation and maintenance of developed schemes throughout their designed lifetime. Regrettably, users in the study area tend see water supply projects provided by governments as 'dividends of democracy' (free gift/reward from governments which they helped to install) and so object to contributions for the maintenance of the schemes. Without appropriate maintenance, the schemes quickly degrade and collapse.

Finally, the participation of benefiting communities in the rural water supply activities in the study area is so limited in all the zones. For instance, only five communities have active VWCs and the involvement of village water committees (VWCs) (water users) was limited only to the protection of water facilities against vandalization, purchase of fuel for power supply, collection of water and reporting of leakages. The communities are not involved in the planning, design, maintenance, installation, operation, allocation and extension of water service delivery.

## THE WAY FORWARD

The current water supply situation in rural communities of Enugu State presents a unique opportunity for the state government and the subsidiary NGOs to rethink their strategies in the rural water service delivery sector. Although, government funded water projects exist in nearly all the rural communities, majority of the projects were found to be non-functional (Table 1). The distribution systems of the few functional ones are not reliable and many rural communities have inadequate or non-water supply systems at all. As a result, most

**Table 1.** Existing water supply facilities in the sampled communities (Enugu State Water Corporation, 2015).

Rural water supply zones	No. of water schemes developed by the Enugu State Govt.	No. of functional schemes	Proposed population to be served	Actual population being served	No. of-schemes requiring major repairs	No. of water schemes developed by NGOs	No. of schemes that have exceeded its life span (20 years)	No. of schemes with active VWCs
Nsukka zone	56	08 (14.3%)	410,736	57,248	46.	05	08	03
Ngwo zone	48	05 (10.4%)	313,448	31,780	43	03	06	03
Enugu zone	28	06 (21.4%)	212,368	32,680	21	01	04	00
Total	132	19 (14.4%)	924,552	122,196 (13.2%)	110 (83.3%)	09	18	05 (3.79%)

households (86.78%) resort to buying of water for drinking and cooking from vendors or trekking long distance to collect water (of questionable quality). Potable water supply is a major problem in all the study communities. The characteristics that have defined service delivery in the water supply sector in the communities according, to our respondents, are limited access, declining quantities supplied, increase in demand due population growth, and low investments. All these can be traced, in part, to the institutional weaknesses on the part of the supply agencies and to state government's inability to priorities potable water supply in Nigeria.

The rural water supply sector in the state requires urgent structural reform and wholesale restructuring. Consequently, the way forward is for the state government, for the good of the rural dwellers, to have the right political will to confront the obstacles causing decay in the rural water supply sector. Specifically, the state government needs to prioritize the maintenance and rehabilitation of rural water supply facilities in the state.

Rehabilitating and up-grading, existing rural water supply schemes is necessary in other to restore them to the designed capacity, boost operational efficiency and enable the schemes benefit from new and better technologies.

### **Research and transparency in agency management**

Secondly, the state government must prioritize research and transparency in system management in order to improve services. Why, for instance, is many of the schemes non-functional? What happens to internally generated revenue and locally mobilized resources? Are the resources provided by government inadequate, misapplied or embezzled? The state government needs to find correct answers to the problems limiting progress in the rural water supply sector through research. Research will isolate the best options to accelerate growth, cut cost, extend services, and promote cost recovery in the rural water supply sector.

### **Increased budgetary allocation to the water supply sector**

Officials of the state water supply agencies reported that necessary rural water projects and maintenance programs are delayed, postponed or avoided due to low budgetary provisions. This, according to these respondents, creates even larger problems in future and partly explains why we have wide-spread dysfunctional water

schemes in many rural communities of the state. A way out of this may be for the state government to increase budgetary allocation to rural water supply sector.

### **Partner with the private sector**

Fourthly, water resource development in the study area should not be left to governments alone, the private sector and users must join hands in financing rural water supply infrastructure. This can be done by tapping or deploying private sector resources towards water resources development. Encouraging private water providers through favorable policies, capacity up-grading and provision of micro-credits at subsidized rates may assist in providing viable and sustainable solutions to water supply inadequacies in the study area.

### **Employ site specific approaches to solving the problems of water supply schemes**

Finally, the problems limiting potable water supplies in the rural communities of Enugu State should be considered on a case-by-case basic across the communities as the problems vary

from one project/community to another. The various cases of breakdowns, abandonments and maintenance backlog will benefit from case-by-case-in-depth analysis, unique insights, and use of project-specific solutions.

## Conclusion

When a proper institutional framework for public water supply is not in place, the water service delivery will be problematic. A weak institutional arrangement for water supply often give rise to declining services, leading to inadequate access, poor cost recovery, and maintenance backlog (Foster, 2013). After many years of attempting developing/managing public water sources, majority of the rural population in our study area still have no choice but to drink dirty water from the same streams and shallow wells used by animals and bird, due largely to weak institutional arrangements. Efficient institutional framework is a very critical for long term sustainability of water service provision. Therefore, there is an urgent need for a strong, dedicated commitment on the side of the government for the provision of a framework that can guarantee sustainable water supplies to communities in the study area. The government must draw-up a new set of strategies to halt the decay in the rural water supply sector. The sector requires urgent structural reforms, wholesale restructuring and institutional strengthening for meaningful progress. This is necessary for improved, efficient and effective provision of water services in the area.

## CONFLICT OF INTERESTS

The author has not declared any conflicts of interests.

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