

Contributions by Stakeholders to Water Supply in the Rural - Urban Communities of Ondo State, Nigeria

Amidu AYENI

Assistant Department of Geography, University of Lagos, Lagos, Nigeria
Tel: +234.8035894730. Email: aayeni@unilag.edu.ng

Alabi SONEYE

Senior Lecturer, Department of Geography, University of Lagos, Lagos, Nigeria
+234.8023126221, asoneye@unilag.edu.ng

Akinlabi AKINTUYI

Department of Geography, University of Lagos, Akoka-Yaba, Lagos, Nigeria, 101017
Tel: +234-803-347-1323. E-mails: akintuyi@unilag.edu.ng; akinakintuyi@yahoo.com

Received: 24 February, 2011

Accepted: 30 June, 2012

ABSTRACT

The most important message that can be drawn on stakeholders' contributions towards rural – urban communities' water supply is the assessment results of infrastructure/facilities. To accomplish this, a thorough appraisal of the infrastructure/facilities in question is needed for effective and safe water supply. Therefore, this study uses field inventory data and geographic techniques in evaluating various stakeholders' contribution in Akoko North East Local Government Area. The techniques and data generated are applied appropriately to understand water supply stakeholders' strengths and weaknesses. However, the study reveals that the impacts of stakeholders on water supply are more felt in the rural areas when the facilities are assessed in term of infrastructure versus human population. In addition, the study shows that not only is there a higher incidence of non-functioning water facilities in the rural areas as opposed to urban areas, but there are more poor people with poor resource in the urban areas than in those rural areas.

KEYWORDS: Water, facilities, Stakeholders, Communities and GIS

INTRODUCTION

Growing scarcity of safe water is one of the critical issues facing rural - urban communities in the 21st century. In most rural - urban areas, due to insufficient water supply infrastructure, improved water resources are abandoned as households choose to use unsafe water sources for example ponds, lakes, rivers, streams (Mu *et al.*, 1990; Asante *et al.*, 2002; Engel *et al.*, 2005). In Nigeria, Government (at all tiers) hardly concerns itself with the adequate provision of improved water supply infrastructure in most communities (Coker and Sridhar, 2002; Itama *et al.*, 2006). As

a result, waterborne infections are on the increase among the populace (Itama *et al.*, 2006; Ayeni *et al.*, 2009). Meeting growing water demand will require improving water management including existing traditional sources of water supply, and expanding water supply capacity and infrastructure (Cai and Rosegran, 2002).

The main responsibility of the Federal Government of Nigeria in water supply is to formulate National Policies that could lead to coordinating the management of water resources. The policies should address the allocation of water resources programmes between states, development and maintenance of water project as well as capacity building. The State governments are to provide safe water to the residents of their respective jurisdiction while Local Government Areas (LGAs) serve as supervisory stakeholder as well as providing and monitoring rural water supply projects such as open wells and boreholes (Handidu, 1990; FGN, 2000).

Provision of safe pipe borne water and boreholes is by both public and private organizations currently. Apart from the three tiers of government, some support organizations such as European Union (EU), United Nations Children's Fund (UNICEF), and *United Nations Development Programme* (UNDP) are also visible in terms of provision of boreholes to the rural areas. These sources are managed informally by the communities who have no knowledge of the improved water technology.

Most of government water supply projects in Nigeria appear ill-conceived. They degenerate fast and fail to meet public water demand. In many instances, they are abandoned institutionally, economically and politically (Folifac, 2007). These contribute to commonly observe limited impacts on potable water management, sustainability and service delivery (Harvey and Reeds, 2006). As noted by Coker and Sridhar (2002), community involvement in water management is sustainable only where there are strong local institutions in place including Community Development Associations (CDAs). The Akoko North East in focus in this study is a prototype of many LGAs in Nigeria that are characterized by disparity in water supply infrastructure provided by stakeholders.

THE STUDY AREA

Akoko Northeast LGA is Located from longitude 5°38'E to 6°04'E of Greenwich Meridian, and latitude 7°26'N to 7°42'N of the Equator. It is bounded by Akoko North West LGA in the north, Edo and Kogi States in the east, Akoko South East and West LGAs in the south, and Ekiti State in the west (Fig. 1). The study area comprises seven towns - Akunnu, Auga, Iboropa, Ikakumo, Ikare, Ise and Ugbe. The area receives on the average about 1500mm of rainfall per annum and experiences a high temperature all year round, ranging between about 30°C to 38°C. The vegetation is predominantly of derived secondary rain forest type. The LGA has a population of about 175,409 according 2006 Census (NBS, 2007).

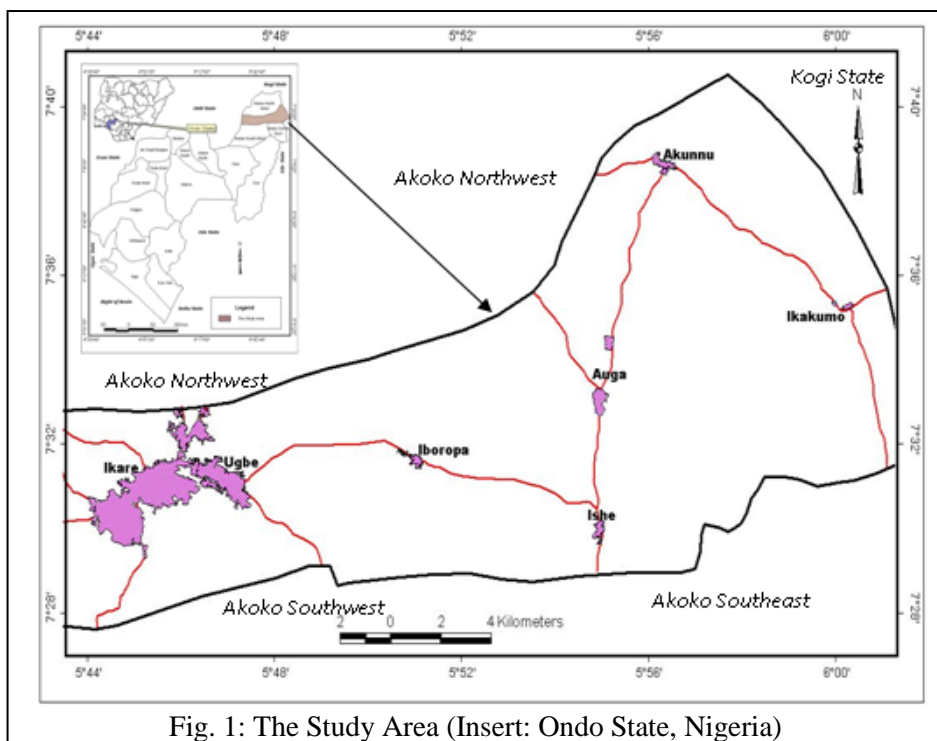


Fig. 1: The Study Area (Insert: Ondo State, Nigeria)

METHODOLOGY

Data for the study include detail field inventory and documented information on water supply providers and infrastructure/facilities within the study area. All data collection activities were conducted between December 2008 and November 2009. The relevant agencies such as Water and Sanitation (WATSAN), State Water Corporation and Akoko Northeast LGA Secretariat are located at Ikare. The 2006 population figures were also sourced from National Bureau of Statistics (NBS) Abuja. Topographical map at scale 1:50,0000 (Sheets 245SW & SE; 246, and 265 NW & NE) and SPOT multi-spectral of 5m image covering the area were used for spatial baseline information. The topographical maps were scanned into TIFF files and imported to Arc-view 3.3 environment where they were geo-referenced to Universal Traverse Mercator (UTM) zone 31 north and digitized. The geo-referenced remotely sensed data was used to update the data generated from the maps.

On-screen and head-up digitizing method were used to generate typology database attributes from the mosaic maps and SPOT image for the study. Themes are created for lines and polygons feature types in ArcGIS shape file (SHP) formats before continuing with the digitizing of the datasets. The features relevant for the study (road and built-up) in the maps and SPOT imagery were identified and delineated. The attribute data were stored in a relational database structure as DBF files. The

processed mosaic topographical map and spot imagery were overlaid and the observe changes were used to up-date the land use/land cover information for the study area.

Microsoft Office Excel, 2007 version, was used to convert attribute data generated from field inventory and administrative records and imported to ArcGIS environment for integration. The edited integrated attributes were overlaid on updated maps and designed for layout. The final layouts were exported as JPEG files. Various illustrative statistics (maps, graphs, tables, charts, pictures) were adopted for result interpretations

RESULTS AND DISCUSSIONS

Stakeholders Participation and Facilities Provided

The major water supply stakeholders in the LGA are: The Federal Government of Nigeria, Ondo State Government, Akoko Northeast Local Government, Non-Governmental Organization (NGOs)/Support Organizations {which include European Union (EU), United Nations Children’s Fund (UNICEF), United Nations Development Programme (UNDP), Directorate of Food, Road and Rural Infrastructure (DFRRI), Petroleum Trust Fund (PTF)}, Community Development Association (CDA) and Households/private for the relevant communities are shown in Table 1.

Table 1: Stakeholders’ participation and facilities provided

Stakeholders and Programmes		Communities						
Stakeholders	Task/Programmes	Akunnu	Auga	Iboropa	Ikakumo	Ikare	Ise	Ugbe
Federal Government of Nigeria (FGN)	Sinking of boreholes	b	b	-	-	B	b	b
Ondo State Government (ODSG)	Provision of pipe borne water and Sinking of boreholes	b	b	b	b	pw, b	b	pw, b
Akoko NE Local Government (ANELG)	Sinking of boreholes and wells	w	b	w	w	B	w	w
Non Governmental Organizations (NGOs)	Sinking of boreholes and wells	b	b	b	b	B	b	b
Community Development Association (CDA)	Wells/Ponds development, Maintenance and management	w, pd	-	w, pd	w, pd	w, pd	w, pd	w, pd
Households /Private	Boreholes and wells	b, w	-	w	w	b, w	-	b, w

pw = Pipe borne water, b – Borehole, w – Well; pd – Pond

Federal Government of Nigeria is involved mainly with sinking of boreholes (in most cases submersible boreholes). This is motivated by political programmes and interest. The impact is felt in 5 out of the 7 communities in the area (Table 1). Ondo State Government is into the provision of public pipe borne water and sinking of public boreholes. The boreholes include hand lift, submersible and solar powered types. The activities are motivated by political projects. However, Water and Sanitation (WATSAN) programme is identified as the most common. The impacts of the Ondo State Government are felt in all the communities through the sinking of boreholes. Pipe borne taps are functioning only at Ikare and Ugbe.

The Akoko Northeast Local Government is notably into sinking shallow wells, machine lift wells and hand lift boreholes in all the communities. The impacts of the LGA in this direction are felt only at Ikakumo and Ikare. The wells are prominent at Akunnu, Iboropa, Ikakumo, Ikare and Ise. NGOs/Support Organizations are into sinking of different types of boreholes. Their impacts are well noticed in all the communities. CDAs are into maintenance and management of ponds and sinking of shallow wells. Their impacts are felt in all the communities except at Auga where the European Union was reported to have stopped the use of pond in the early 1980s. In addition, the Auga custom does not allow sinking of well. Some households have resources to provide some water facilities. These include wells and submersible borehole. Household well are noticed at Akunnu, Iboropa, Ikakumo, Ikare and Ugbe. A few private boreholes are sighted at Ikare and Ugbe.

Pipe borne water and boreholes facilities

About 57% and 60% of public taps provided by Ondo State Government are not functioning in Ikare and Ugbe respectively (Fig. 2). Also, none of the pipe borne water taps in Akunnu, Auga, Iboropa, Ikakumo and Ise is functioning. This is because they are not connected to the Awara Water Supply Scheme distribution network.

The pipe borne water points and distribution channel pipes installed by the then Western Region Government are very old (about 42 years old). As a result, the quality of pipes is gradually deteriorating; hence, they are more vulnerable to corrosion. According to the Ondo State Water Corporation Officer at Ikare area Office, materials used for the pipelines distribution network are made up of pre-stressed reinforced concrete cement, galvanized iron and cast iron. A total of 74 boreholes of different types are located spatially in all the communities and are owned by different stakeholders. The Federal Government, State Government and Local Government owned 8, 33 and 2 respectively (Fig. 3).

Fig. 4 shows the percentage distribution of different types of borehole in each town. For instance, in Akunnu and Auga, hand lift accounts for 50% and 83% respectively. On the average about i.e. 54% of the boreholes sited in the LGA are not functioning. The number of functioning boreholes varies among the communities (Fig. 5).

The inefficiency and unproductive status of pipe borne water supply and public boreholes have resulted in a situation where we have about 1,447 persons per borehole in Akunnu, 443 persons per borehole in Auga, 4,399 persons per borehole in Iboropa, 729 persons per borehole in Ikakumo, 16,667 persons per borehole in Ikare, 1,676 persons per borehole in Ise and 2,581 persons per borehole in Ugbe.

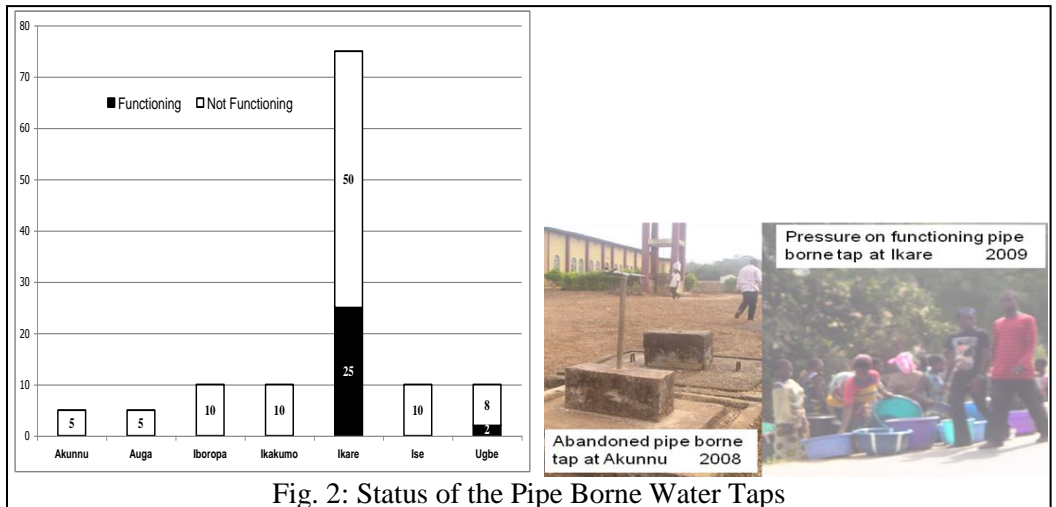


Fig. 2: Status of the Pipe Borne Water Taps

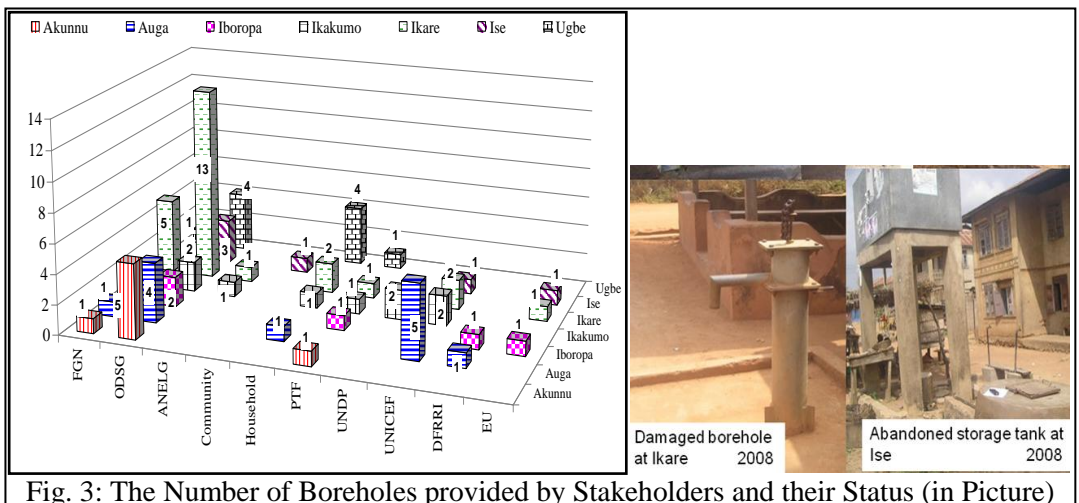


Fig. 3: The Number of Boreholes provided by Stakeholders and their Status (in Picture)

Status of wells and ponds

The results of the finding reveal that about 99.8% of the wells in Akoko Northeast Local Government Area are dug and owned by individual households or clans. Most of the wells are lined with rings and are covered with iron plate. The management and maintenance of the wells are absolutely based on the capacity of the owners.

All the communities in the study area except Auga have their ponds owned by clan or group of clans. Ponds maintenance which includes annual dredging, enforcement of socio-cultural custom/law and order are entrusted to the age groups and CDAs (Table 1 and Fig. 3).

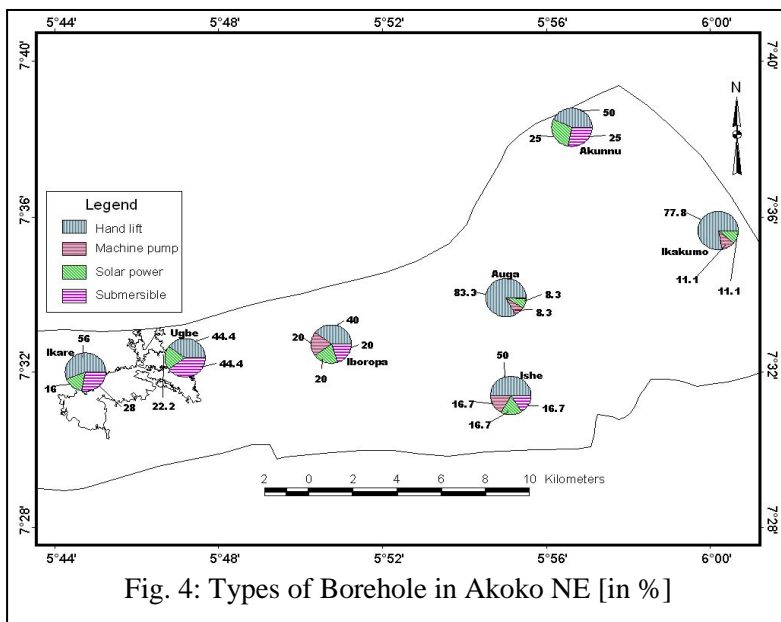


Fig. 4: Types of Borehole in Akoko NE [in %]

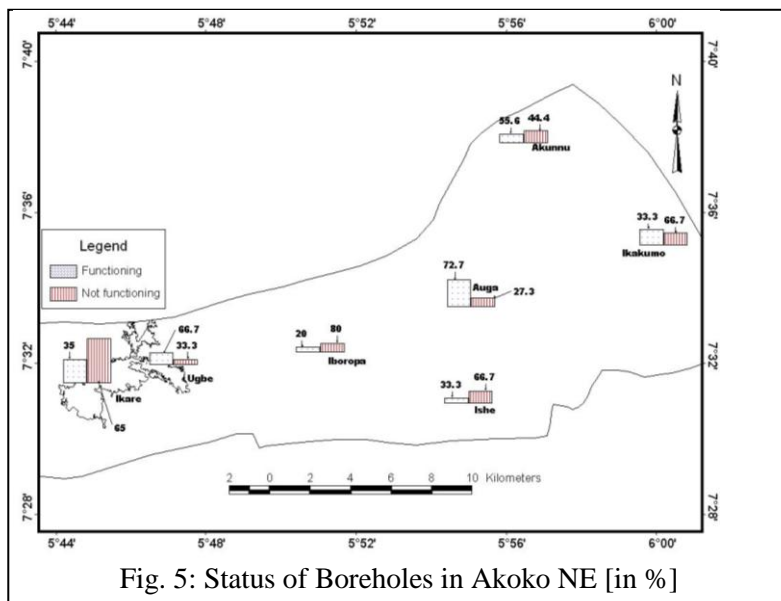


Fig. 5: Status of Boreholes in Akoko NE [in %]

Majority of the population who live in the study area belongs to the low-income class that cannot afford vendor/packaged water or sink protected boreholes or wells. Public pipe borne water is not available in 5 of the 7 studied communities. Materials used for the water supply pipelines distribution network are

very old. In fact, the water supply pipelines are about 42 years old. Hence, they are continuously deteriorating and therefore, need to be replaced.

The materials used for most of the public boreholes are sub-standard as shown in Fig. 6 through Fig. 11. As a result, fairly large numbers of unprotected shallow wells of low yield and unsatisfactory poor quality have been sunk by the residents (Ayeni *et al.*, 2009; Ayeni 2010; Ayeni and Soneye, 2011).



Fig. 6: Ringed and covered well at Ikare



Fig.7: Uncovered well at Akunnu



Fig. 8: Pond protection with sticks at Akunnu



Fig. 9: Pond protection with heavy stones and dry palm fronds at Ikare



Fig. 10: Pond protection with stones at Ise



Fig. 11: Pond protection with concrete walls, planks and iron sheets at Ikare

The percentage of functioning public taps and boreholes revealed that the impacts of government have not been adequately felt in the area. The support organisations such as UNICEF, EU, UNDP, etc. have tried on their part in this regard but have failed to develop the human resources required to maintain their boreholes. Efforts of CDAs are well felt but cannot address the problem of unsafe water (Ayeni, 2010).

CONCLUSION

The study adopts geographic illustrative methods that evaluate, quantify and give visual impression of the performance of the different stakeholders on specific water supply issues. The analysis of individual stakeholder contribution has therefore revealed the great diversity of water supply development challenges. Furthermore, water supply infrastructure patterns vary, not only between towns, but also between areas within the same town or even between different households. However, this diversity can be viewed as a great potential strength which governments can exploit during the implementation of rural development programmes. If governments can create appropriate policy and programmes that are supported by trained personnel, community water management option will be more effective in managing water supply infrastructure provided by stakeholders. This implies handing over the maintenance of rural water infrastructure/facilities to communities will ensure the highest quality of local participatory and systems based support from public-private stakeholder partnerships.

REFERENCES

- Asante, F., T. Berger, S. Engel and M. Iskandarani (2002): Water security in the Ghanaian Volta Basin: Patterns, determinants, and consequences. *Quarterly Journal of International Agriculture*. **41 (1/2)**: 145-167
- Ayeni, A. O., A.S.O. Soneye and I. I. Balogun (2009): State of Water Supply Sources and Sanitation in Nigeria: Implications for Muslims in Ikare-Akoko Township The Arab World Geographer **12 (1-2)**: 95–104
- Ayeni, A. O. (2010): “Spatial Access to Domestic Water In Akoko Northeast LGA, Ondo State, Nigeria” *Unpublished Ph.D. Thesis*, University of Lagos, Lagos, Nigeria
- Ayeni, A. O. and A. S. O. Soneye (2011): Mapping Population Water Poverty of Akoko Northeast Communities, Nigeria. in *Environmental Research and Challenges of Sustainable Development in Nigeria* by Salami A. T. and O.O.I. Orimogunje (Eds), Ile-Ife, Obafemi Awolowo University Press, pg 81 – 90
- Cai, X. and M. W. Rosegran (2002): Global Water Demand and Supply Projections. Part1. A Modeling Approach International Water Resources Association (IWRA) *Water International*, **27(2)**: 159–169, June 2002

- Coker, A. O. and M. K. C. Sridhar (2002): Mini water supplies for sustainable development, Nigeria. *Sustainable Environmental Sanitation and Water Services 28th WEDC Conference Kolkata (Calcutta), India*
- Engel, S., M. Iskandarani and M. Useche (2005): Improved Water Supply in the Ghanaian Volta Basin: Who uses it and who participates in Policy Decision Making? *International Food Policy Research Institute (IFPRI) Paper 129 Environmental Inter-national Ruth E.A. (ed) USA, Pergamon Publishing*
- FGN (2000): Water Supply & Sanitation Interim Strategy Note. *Federal Republic of Nigeria (FGN)*, November 2000
- Folifac F. A. (2007): National Water Policies and Water Services at the extremes: What Challenges must be faced in bridging the gap? Learning from the South Africa Experience. *African Water Journal. 1(1) A Publication of UN-Water/Africa*
- Handidu, J. A. (1990): National Growth, Water Demand and Supply Strategies in Nigeria in the 1960s. *Journal of the Nigerian Association of Hydrogeologists (NAH) Vol. 2 No. 1*
- Harvey, P. A. and R. A. Reeds (2006): Community-managed water supplies in Africa: Sustainable or dispensable? *Oxford University Press and Community Development Journal, Page 365 -377. doi:10.1093/cdj/bsl001*
- Itama, E., I. O. Olaseha, and M. K. C. Sridhar (2006): Springs as supplementary potable water supplies for inner city populations: a study from Ibadan, Nigeria. *Urban Water Journal, 3(4): 215 - 223*
- Mu, S., D. Whittington, and J. Briscoe (1990): Modelling village water demand behavior: A discrete choice approach. *Water Resources Research 26(4): 521-529*
- NBS (2007): *Federal Republic of Nigeria Official Gazette (No. 24, Vol. 94) on 2007 (National and State Provisional Totals 2006 Census)*, National Bureau of Statistics (NBS) Publication.