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MANAGEMENT OF COMMUNITY DEEP-WELL WATER SUPPLY IN LAGELU LOCAL GOVERNMENT AREA, IBADAN, OYO STATE, NIGERIA

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Abstract: The aim of the study is to examine the management of community deep-wells in Lagelu local government area. It examines the characteristics of deep well (s)water supplied through the formulation of five research objectives which are the socio-economic characteristic of respondents, features of deep –wells in the area, respondents perception of deep -wells water supply problems, the current management strategies of deep -wells water supply and make recommendations for sustainable deep- wells water supply in the study area.

A total number of 239 questionnaires were randomly distributed to residents in the area to obtain relevant information on the socio-economic characteristics of the residents, features of deep well water supplied and its effects on the health of the residents in the study. Data were collected and analyzed using simple descriptive statistical analysis involving frequency counts, tables and percentages. The study reveals that the residents of the study area are facing problems of inadequate deep -well water supply.

In view of this it is recommended that government should embark on massive construction of deep–well water facilities in the area. In addition, each household should endeavor to purify their water before consumption.

Keywords: Deep–well, water, management, sustainability.

1.0 Introduction

The state of water supply and sanitation access worldwide is alarming: in 2000, 1.1billion people lacked access to improved water supply, and 2.4 billion to adequate sanitation, more located in rural than urban areas (WHO/UNICEF, 2002). Considering the population growth, these figures are going to increase unless appropriate and sound measures are taken to reverse this trend. Nigeria government has a huge challenge to face in order to achieve Target 10 of the Millennium Development Goals (MDG), which is to "halve the proportion of people without access to safe drinking water by2015". Water and sanitation projects coupled with hygiene promotion are also recognised as important in order to achieve all the MDG Goals improvements, including reduction of poverty, gender issue, health improvement and

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education. Africa, where 28% of the total un-served population for water supply live (WHO/UNICEF, 2002), has a great challenge ahead. As the most populated country of the continent, Nigeria will be central as to whether or not Africa reaches the MDG.

Water is life and precious to mankind, access to safe drinking water has improved steadily and substantially over the last decades in almost every part of the world. Well water is an excavation or structure created in the ground by digging or drilling to access groundwater in underground aquifers. The well water is drawn by an electric submersible pump, a trash pump, a vertical turbine pump, a hand-pump or a mechanical pump (e.g. from a water-pumping windmill). It can also be drawn up using containers, such as buckets that are raised mechanically or by hand. Wells can vary greatly in depth, water volume and water quality. Well water typically contains more minerals in solution than surface water and can promote the growth of iron and manganese bacteria that can form slimy black colonies that clog pipes (Oluwande and Olugbenga 1991 and UNDP 1998).

Shallow pumping wells can often supply drinking water at a very low cost, but because impurities from the surface easily reaches shallow sources, a greater risk of contamination occurs for these wells when they are compared to deeper wells. The quality of the well water can be significantly increased by lining the well, sealing the well head, ensuring the area is kept clean and free from stagnant water and animals, moving sources of contamination (latrines, garbage pits) and carrying out hygiene education. It is important that the well is cleaned with 1% chlorine solution after construction and periodically every six months (UNICEF 2002).

The present water situation is characterized by problems in large parts of the world. The main water problems arise from an increase in water demand as a consequence of urbanization, industrialization as well as the increase in population and a desirable rise in standards of living among others. This has created planning problem which is complex and increasing within the above stated factors. Mabogunje (1993) the provision of basic infrastructural services (such as water) in virtually all Nigerian cities and villages is characterized today by acute shortage, frequent breakdown and un-sustained quality of provision.

According to (UNCHS 1995), the importance of water has been emphasized in the water international and world water day. It is a daily necessity and a key factor in human health and well being. Apart from the survival and continued well being of human and animal life depend on the supply of potable water in the right qualities and quantities. Water influences the performance of many sectors of the economy such as agriculture, health, industry,

recreation and other purposes (Adeniji 1985). Ayoade and Oyebande (1983) explained that there is a close relationship between water availability and economic development in Nigeria. Therefore, water is life.

They further observed that availability of potable water is one of the major factors affecting spatial distribution of population. Despite the merit-able importance of water, it has been observed that there is an increasing gap between supply and demand. Adeniji (1985) stressed that unless decisive action is taken whenever demand is overreaching supply, man will fund himself on threshold not of a problem but of crises. He further argued that inadequate water supply is peculiar to less developed countries but Davies et al (1995) counter such assertion and argued that water shortage is a worldwide problem which needs community involvement because government cannot bear all the responsibilities involved in the provision and maintenance of safe water. They further advocated a partnership approach in the provision of safe water supply.

According to (UNCHS 1995) reported that only eight out of about 50 countries in Africa, supplied water to more than 50% of their population. The situation is worse in Zaire, Guinea-Bissau, Madagascar and Sierra-Leone, where not more than 10% of the rural population has access to safe drinking water.

Access to safe drinking water according to the World Health Organization (WHO, 1992) is a basic requirement for health to prevent diseases. They remarked that consumers of water must be within 15 minutes walking distance to a treated water source. Most settlement lack access to safe and potable water supply. Thus, people make do with the available water, either good or not for daily consumption. The indispensability of water has made it necessary for us to be studying it every now and then. Obviously, one of the major problems confronting and debilitating the growth of rural areas in Nigeria is the problem of potable water availability, lack of clean water cause a lot of havoc to both human being as well as livestock which is a source of economic booster especially for farmers and other rural dwellers. The specific objectives of the study are to: examined the socio-economic characteristics respondents, identify the features of deep-well(s) water in the area, stakeholders, mode of drawing water, their storage water facilities and evaluate the management of deep-well water facilities in the area.

2.0 Materials and methods

a. Brief of the study area

Lagelu local government is one of the 33 local Government councils in Oyo state with its headquarters at Iyana-offa is in the eastern part of Ibadan the capital of Oyo state. It has an area of 338km square and a population of 147,957. It shares boundary with Iwo Local Government in the North and Egbeda Local Government in the West. It is also bounded in the South by Ibadan North East Local Government and Akinyele local government to the East. The study covers ten political wards in Lagelu local government area namely: Ajara/Opeodu, Apatere/Kuffi/Ogunbode, ArulogunEhin/Kelebe, Ejioku/Igbon/Ariku, Lagelumarket/ Kajola/Gbena, Lagun, Lalupon I, LaluponII, LaluponIII, Ofa Igbo, Ogunjana/Olowode/Ogburo, Ogunremi/Ogunsina, Oyedeji/Olode/Kutayi And Sagbe/Pabiekun

b. Methods of Data Collection

Data were collected from both primary and secondary sources. The primary sources include information from the field through structured questionnaire administration, personal observation and oral interview from respondents and opinion leaders. Such information include: the socio-economic characteristics of respondents, features of deep-well water and their locations, accessibility of deep-well water, water quality in relation to health of the residents, sponsors of deep-well water in the area, mode of drawing water from the deep-wells, type of storage water facilities, perception of respondents on the outbreak of water borne diseases emanating from deep-well water and their management strategies. The secondary sources involve the review of relevant literature on deep-well water supply and maintenance.

c. Methods of data analysis

Data were collected and analyzed through descriptive statistics such as frequency count, table and percentages to affirm the sustainability of deep-well water supply in the study area.

3.0 Results and Discussions

a. Socio-economic - characteristic of the respondents

Table 1 reveals that 55.6% of the respondents were males and 44.4% females. Majority of the respondents were between the age bracket of 26-35 years (38.5%), 46 years

above (25.1%), 36-45 years (18.8%) and 15-25 years(17.6%). Married respondents among them were 41.8%, divorce 22.2%, widow 19.7% and single 16.3%. However, majority of them were civil servants 38.6%, trading 27.%, farming 25.1%, artisan 5.4% and others 6.3%.Their educational status, 31.4%had no non-formal education,12.6% primary education, 26.8% secondary education and those that hastertiary education were 29.3%. Majority of them were also Christians 60.3%, and Islam 39.7%. This implies that inrespective of their sex, age, educational status, occupation and religion, deep-well water was needed as an alternative sources of water supply for their day-to-day domestic activities and other purposes.

b. Characteristics of deep-well water in the study area

Table 1: Characteristics of deep-wells in the study area

Variables		frequency	percentage
a) SPONSORS OF DEEP-WELL	. Government	70	29.3
	. NGO	29	12.1
	. Community	100	41.8
	. Affluent	40	16.7
b) METHOD OF COLLECTING WATER	. Head porterage	155	64.9
	. House tap	64	26.8
	. Use of vehicle to fetch water	20	8.4
c) QUANTITY OF WATER	. Very satisfied	43	18.0
	. Satisfied	37	15.5
	. Fairly satisfied	108	45.2
	. Not satisfied	51	21.3
d) MODE OF DRAWING WATER	. Tin bucket	45	18.8
	. Rubber bucket	140	58.6
	. Tube bucket	34	14.2
	. Pumping machine	20	8.4
e) STORAGE	. By tank	39	16.3

FACILITIES	. Drums	100	41.8
	. Secured pots	60	25.1
	. No storage facility	40	16.7
TOTAL		239	100

Source: Author's fieldwork 2013.

(i) Sponsors of deep-well water

According to the respondents as indicated in the table 1, (41.8%) of deep-wells were donated by community, (29.3%) government, (16.7%) by affluent families and (12.1%) Non-Governmental Organizations (NGO). From the survey conducted most of the public deep-wells in Lagelu local government area were donated by the community.

(ii) Method of collecting water from the deep-well water

Table 1, reveals further that(64.9%) of the respondents prefer to transport water by carrying it on their heads, (26.8%) use pumping machine to obtain water from deep-well, while (8.4%) prefer to use vehicle to fetch water from nearby sources of deep-well.

(iii) Residents satisfaction with the quantity of deep-well water

Table 1 also reveals that (45.2%) of the respondents were fairly satisfied with deep-well water supplied, (21.3%)expressed total dissatisfaction with the condition of deep-well water, (18.0%) expressed high satisfaction with the deep-well water supply and (15.5%) were relatively satisfied with the quality of deep-well water supplied. Oral interview with opinion leaders in the area shows that some residents in ward 5 of Lagelu local government area were not satisfied with the quantity of deep-well water supplied because there were no public pipe-borne water taps in the area.

(iv) Mode of drawing water from the deep-well water

Table 1: reveals that (58.6%)of the respondents use rubber buckets to draw water from deep-wells, (18.8%) of the resident use tin buckets, (14.2%) draw water with tube - buckets and (8.4%) use pumping machines. From the analysis, large percentage of respondents prefer to draw water from deep-well with rubber buckets because it is convenient to pull and affordable.

(v) Respondent water storage facilities

Table 1 indicate that only (41.8%) of respondents used rubber drums as their water storage facility which could only serve the household for about 2-3 days, (25.1%) used

secured clay pots to store water, (16.7%) has no water storage facilities apart from their small buckets or pail that could only hold water for a day and (16.3%) metal tanks.

c. Management of deep-well water system in the study area

Table 2: Management of deep-well water system in the study area

variables		frequency	percentage
a) TREATMENT OF WATER	. Boiling	45	18.8
	. Use of alum and sieving	109	45.6
	. Chemical treatment	45	18.8
	. Others	40	16.7
b) AVAILABILITY OF IRON COVER FOR DEEP-WELLS	. Yes	190	79.5
	. No	49	20.5
c) METHODS OF COVERING THE DEEP- WELLS	.i Ring iron bar	192	80.3
	.Ii Open	27	11.3
	iii Wood plank	20	8.4
d) REPAIR OF DEEP-WELLS	. Regularly	23	9.6
	. Once in a year	106	44.4
	. Not regular at all	60	25.1
	. I don't know	50	20.9
e) AGENCIES INVOLVED IN THE REPAIR OF DEEP-WELLS	. Community	142	59.4
	. Government	30	12.6
	. NGO	40	16.7
	. Affluent	27	11.3
TOTAL		**239**	**100**

Source: Author's fieldwork 2013.

(i) Treatment of water before use

Water can be polluted right away from the source, thereby render it unsafe for human consumption unless it is well treated. Ground water can be naturally reached in mineral matter thereby making the water unsafe for most uses unless the demineralization process is

undertaken. There is high tendency of using contaminated water when it is assumed potable and safe for human consumption on the platform of physical screening of the water being odorless and tasteless, it is possible that water may pass physical test but chemically when subjected to laboratory test it contains pathogens and other chemical elements harmful to human body.

Table 2 indicates that (45.6%) of respondent treat their water by using alum and sieving method, (18.8%) by boiling, (18.8%) used chemical treatment like chlorine etc and (16.7%) fell under the group "others" which indicates no treatment and water is consume raw. The use of ropes and buckets for drawing water from deep-wells can be a source of pollution if not kept in hygienic place.

(ii) Availability of iron covers to protect the deep-wells

Table 2 reveals that (79.5%) indicated "yes" those deep-wells in their compound has iron cover while (20.5%) indicated "no" that there is no iron cover for deep-wells their compound. Absence of iron cover to protect some of these deep-wells could result to water pollution.

(iii) Method of covering deep-wells in the study area

Table 2 revealed that 80.3% respondents indicated "ring iron bar" as a protective cover for deep-wells, 11.3% indicated that most of the deep-wells were opened for rodents, flies etc to enter and 8.4% use wood planks to cover their deep-wells. Despite the various methods used the rusting of iron lead cover and wood can contaminate deep-well water in the area.

(iv) Repair of deep-wells in the study area

Table2 shows that majority of the respondents (44.4%) indicated "once in a year" deep wells were repaired, (20.9%) indicated "I don't know", (25.1%) "Repairs were not regular at all" and (9.6%) "repairs were regular". However, the constant repairs of deep-wells reduces threat on water incidence, though deep-well water may be assumed to be clean, some people use unclean materials to draw water thereby introducing pollutants into water which may render it unsafe for human consumption. Hence there is need to repair and protect deep-well water to ensure safe and potable water for consumption in the area as indicated in plate 1

(v) Agencies involved in the repair of deep-well water in the study area

Table 2 shows different agencies and individuals' involvement in the repair of deep-wells in the study area, with community based organizations efforts having the highest involvement of (59.4%), followed by Non-governmental Organization (NGO's) (16.7%), government

(12.6%) and affluent families 11.3%. Oral interview with respondents from field survey shows that governments' participation in the repair of deep-wells in the area was poor which needs to be improved. Most repairs were mostly done by the community.

Plate1: Deep-well in Ajara, Lagelu local government area, Ibadan, Nigeria.

Source: Author's fieldwork 2013.

4.0 **Recommendations**

The following recommendations are advanced based on specific research findings for the study:

- As suggested by the residents government should embark on the provision of potable water supply by construction of more deep-wells and boreholes in the study area.
- Every household should endeavor to purify their water themselves before drinking and used for other domestic activities. Household water can be purified by boiling to 100^0c and use of chemical treatment like aluminum sulphate (Alum), and chlorine. Different household filters are available in the market that can be used to purify water.
- The public health officials in the area have to contribute in respect of organizing seminars and public enlightment campaign on the management deep-wells. Also there is need for constant surveillance by public health officials to enforce water quality control measures and ensure safe and potable deep-well water supply at all time.
- Regular water test should be carried out on the source and point of consumption to detect impurities so as to reduce and eliminate health hazards.

- Furthermore, there is need to gather data to monitor how water quality and quantity change with time: this will help in formulation of plan. With the data, government should embark or undertake a comprehensive sustainable deep-well water development plan together with waste management programme to protect water from being polluted by the wastes generated by various human activities.
- A technical consumer's guide for private deep-well owners should be developed to focus on improving technical knowledge of deep-well construction and maintenance. Outreach, inspection and enforcement efforts should be aimed at ensuring that large diameter deep-wells are constructed to reduce the potential points of entry. The link between sustainability and construction materials and methods needs to be more fully explored.
- Guidelines for deep-well location and construction should incorporate information regarding topography of the property, any structural problems that may be present due to the soil type or geology, and where possible, the local flow of groundwater should be known before a deep-well is drilled. Deep-wells should be positioned so that they are not located down-gradient from any pollutants.
- Also, the quality of the deep-wells water can be significantly increased by lining the deep-wells, sealing the deep-wells head, fitting a self-priming hand pump, constructing an apron, ensuring the area is kept clean and free from stagnant water and animals, moving sources of contamination (latrines, garbage pits) and carrying out hygiene education. The deep-wells should be cleaned with 1% chlorine solution after construction and periodically every 6 months.

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