



PATTERN OF WATER SUPPLY IN RELATION TO DIFFERENT WATER SOURCES IN METROPOLITAN KANO

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ABSTRACT

The study carried out on pattern of water supply in relation to different water sources in metropolitan Kano was aimed to assess the pattern of water supply in the area. Eight local government areas were found in the area but six local government areas were selected in conducting the research work. The selected local government areas included dala, Fagge, Kano Municipal, Gwale, Tarauni, Nassarawa. The research work was conducted through the following methods of data collection, (questionnaire and interview). Krecjie and morgan sampling techniques was adopted in administering the questionnaire, because it was the best sampling techniques that suited the study. The result of the findings indicated that ground water sources are now the major sources of water used in the study area, pipe borne water was generally inadequate. Dala, Kano Municipal, Fagge and Gwale were the areas mostly affected with scarcity of pipe borne water. Other sources of water for household usage included water from vendors and water supply Tankers. Some sources of water were founded inactive (that is sources of water producing less or no water due to some problems). Most people in the area depend on sachet water as their source of drinking water. Finally, in order to overcome some of the problems of water is their source of drinking water. Finally, in order to overcome some of the problems of water supply it was recommended that there should be alternative sources of power, regular maintenance, train of manpower, and effective management of water supply systems.

Keywords: Pattern, water, water supply, water sources.

INTRODUCTION

Water is the most important resource for sustaining of ecosystems. It provides life supporting services for people, animals and plants.

Water is needed for personal hygiene, sanitation, cooking, cleaning and laundry. It is essential for agriculture, fisheries, industrial production, river navigation, maintenance of ecological assets and biodiversity, promotion of tourism and many other social demands.

Water may be obtained either by using surface supplies, that is in lakes, streams and rivers or by tapping the ground water supplies by springs, wells and borehole.

Rapid population growth combined with industrialization, urbanization, agricultural intensification and water intensive life style is a resulting factor for global water crises. About 20% of the population currently lack access to safe sanitation system. Falling water tables are wide spread and cause serious problems both because the lead to water shortage. Contamination of drinking water, nitrates and heavy metals pollution of lakes and reservoirs are common problems throughout the world.

United Nation emphasized that many people access to safe clean water is not yet attained, partly because of the failure to improve the quality and reliability of the service delivery in the water sector. This problem is more enormous in the developing countries and has since resulted in massive poverty, hunger and diseases (United Nation, 2003). The problems associated with lack of adequate water in the country threaten the health of about 40 million people at risk.

Nigeria is one of the countries in sub-Saharan Africa whose records on general access to water supply and sanitation facilities by the citizens remain very poor, Nigerian cities and environment in particular are fraught with inexorable rise of squatter settlements, breakdown of waste disposal arrangement, air and water pollution and inadequate water and sanitation services. Many problems of mortality, morbidity and poverty have been reported in the supplies as well as poor sanitation coverage and deteriorating environmental quality. In spite of the considerable investment of governments in Nigeria over the years a large population still does not have access to water in adequate quality and quantity. It is estimated that only 48% of the inhabitants of Urban and semi urban areas of Nigeria and 39% of rural areas have access to potable water supply. In spite of these low figures the average delivery to the urban population is only 32 liters per capita per day (lpcd) and that for Rural areas is 101 pcd (FGN, 2001)

The objective of the research is to identify the different sources; underground and surface water, Causes of insufficient supply, challenges of various sources of water supply in the study area

Study area

The study area located in North Western Nigeria encompasses eight local government areas (Kano municipal, Dala, Fagge, Gwale, Nassarawa, Tarauni. Kumbotso and Ungogo). It occupies an area of about 683km³ with an aerial distance of 19km from east to west and about 15km from north to south respectively. It is located around latitude 12°25" to 12°40" north and longitude 8°35" to 8°35" east of the Greenwich meridian.

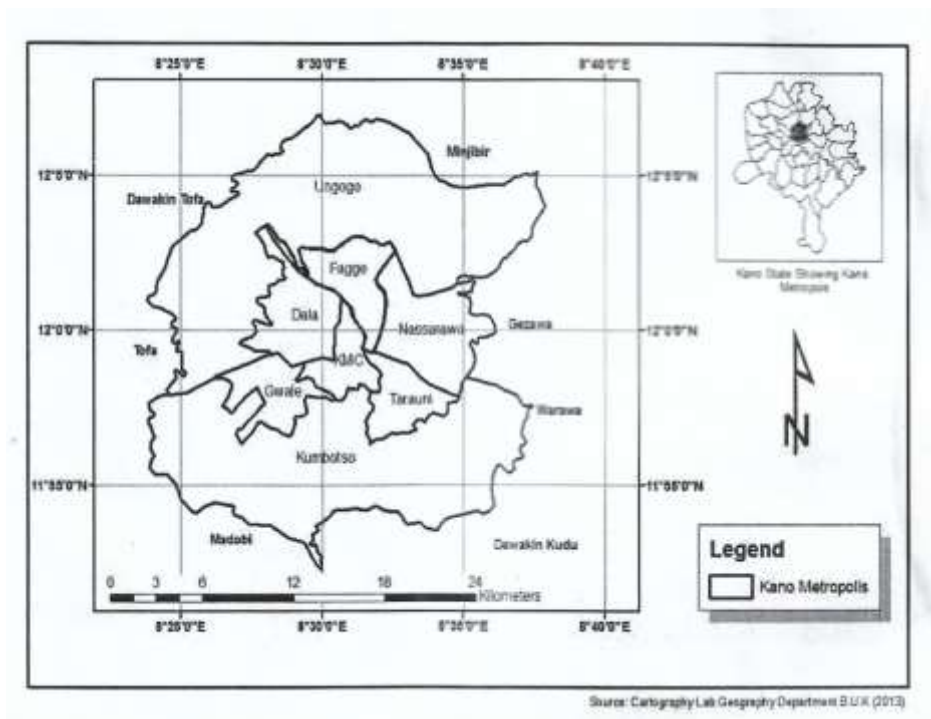


Figure 1:

Kano

Metropolitan

The climate of Kano is described as Aw by Koppen classification, with annual and seasonal variability. According to Maryam et al., (2014) four distinct seasons are experienced which are the dry and cool, dry and hot, wet and warm, dry and warm.

The area is generally plain with an elevation of not more than 600meters above mean sea level. It is characterized by basement complex of undifferentiated granitic materials. The area is a zone of high surface water discharged and retention which makes it possible for the accumulation of the surface water especially in ponds and rivers around the area. The gentle sloping terrain made the natural hydrology predominantly a surface one.

METHODOLOGY

In order to capture the pattern of water supply in the study area, structured questionnaire was the basic instrument used for collection of data. This is due to its simplicity and convenience considering the large sample size of the population. Krejcie and Morgan sample size table determinant was adopted in order to come up with sample size that will best represent the population

of Kano metropolitan. To have a representative sample size of the population of Kano metropolitan (2,828,861, NPC, 2006). Krejcie and Morgan state that for a population of 1,000,000:00 and above a sample size of 384 will be a representative. So our population size is 384 as well as the number of questionnaire to be distributed. Verbal interview was also conducted where some information was obtained from some staff of Kano State Water Board.

See appendix for sample of questionnaire and interview.

Data Analysis

The data was analyzed using the information collected from the questionnaire and was examined and statistical package for social science was used in processing the data. The data was coded and simple analytical tools were constructed making the data simple and more meaningful.

RESULTS AND DISCUSSION

The result of the research in accordance with the objectives is presented as follows.

Table 1: Demographic Characteristic of Respondents

		Frequency	Percentage
Gender	Female	180	50
	Female	180	50
Material	Divorce	3	0.8
	Married	306	85
	Single	48	13.3
	Widow	3	0.8
<hr/>			
Educational			
Status	Degree	99	27.5
	Diploma	54	15
	HIS	3	0.8
	Islamic		
	Education	30	8.4
	JSSE	9	2.5
	LLB	3	0.8
	Masters	27	7.5
	NCE	15	4.2
	Nil	27	7.5
	OND	9	2.5
	Primary	6	1.7
	SSCE	66	18.4
Students	3	0.84	
Total		360	100

Source: Researchers computation

Table 2: Occupation characteristics of the respondents

Occupation	Frequency	Percentage
Barrister	3	0.8
Business men	63	17.5
Carpenter	3	0.8
Civil servant	75	20.8
Computer technician	3	0.8
Consultant	3	0.8
Craft men	3	0.8
Doctor	6	1.7
Drivers	9	2.5
Gardener	3	0.8
House waves	57	15.8
Mechanics	6	1.7
NGO	3	0.8
Nil	36	10
Security	6	1.7
Student	3	0.8
Tailors	18	5
Teachers	45	12.5
Traders	15	4.2
Total	360	100

Source: Researcher's computation

From 2 above, it can be seen that the resident of the study area are engaged in various occupation, but the dominant occupation in the study area was civil service, that is 20% of the respondent, followed by business men which represent 17.5% of the respondent, then house wives which represent 15.8% and finally teachers who represents 12.5% of the represents.

Table 3: Major Sources of Water

Sources of water	Frequency	Percentage
Borehole	156	43.3
Borehole/pipe/well borne/well	3	0.8
Pipe borne water	69	19.2
Water from tankers	33	9.2
Waters vendors	48	13.3
well	51	14.2
Total	360	100

Sources: Researcher’s computation

From Table 3 above, it can be seen that borehole is the major sources of water supply in the student area which represent 43.3% followed by from well which represent 14.2% then followed by pipe borne water which represents 19.2% and finally water from waters vendor which represents 13.3%

Table 4: Reason for using a source of water

		Reason for using sources of water					
		Convenience		Availability		Income level	
		N	%	N	%	N	%
LGA	Dala	6	1.7	21	5.8	33	9.2
	Fagge	12	3.3	12	3.3	36	10.0
	Gwale	27	7.5	12	3.3	24	6.7
	Municipal	6	1.7	15	4.2	36	10.0
	Nassarawa	12	3.3	3	.8	45	12.5
	Tarauni	24	6.7	12	3.3	24	6.7

Source: Researcher’s computation

Table 5: Causes of insufficient water supply

Causes	Frequency	Percentage
Blockage from pipe	126	35
Can’t say	114	31.7
Distance from water source	36	10
Population pressure	39	10.8
Others	45	12.5
Total	360	100

Source: Researcher’s computation

Some of the reason that cause water shortage include blockages from pipe with 35%, then distances from water supply source with 10% and population pressure 10.8% shown in the table above.

Table 6: Water availability since 2000

Availability	Frequency	Percentage
Can’t say	42	11.7
Great improvement	63	17.5
Little improvement	123	34.2
No improvement	132	36.6
Total	360	100

Source: Researcher’s computation

From table 6 above, it can be seen that water availability since 2000 till date has seen minor improvement in the study area as only 17.5% of the respondent have seen great improvement while 34.2% of the respondent have seen little improvement and 36.7% of the respondent have seen on improvement. Hence resident of the study area tend to access their water 100% based on physical quality.

Table 7: problem of water shortage

		Frequency	Percentage
Problem of water Shortage	Constraints to domestic Activities	114	31.7
	Extra expenditure	126	35
	Others	18	5
	Time factor	102	28.3
	Total	360	100

Source: Researchers computation

From Table 7 above, the challenges faced by water users include constraint to domestic activities which cover 31.7% of the respondents, only 28.3% of the respondents are the view that problem of water shortage is caused by time factor i.e time taking to access the water.

Table 8: Challenges Faced by Water Consumers

Challenges	Frequency	Percentage
Barriers from water supply sources	144	40
Activities	102	28.3
Higher Population Growth		
Seasonal variation	90	6.7
Others	24	25
Total	360	100

Source: Researchers computation

From Table 8 above, 40% of the respondents have seen to face challenges to water due to Barrier from water supply sources, while 28.3% face water challenges due to high population growth which leads to high pressure on the available sources. Only 25% challenges to water to be linked to seasonal variation.

CONCLUSSION

The study reveals that majority of the people in Kano metropolis depend on ground water source as their source of domestic water. Pipe borne water is now readily available due to some factors like problem of power supply from national grade.

Break down of plants and machineries; as well as broken of transmission lines contribute to raw water supply seizure thereby affecting raw-water supply output. Many a times, the mechanical and electrical components of the raw pumps gets damage due to tear and wear of the pumping machines as such delay is created until the raw-water pumps are either repaired or replaced.

Seasonality is also a factor that contributes to low-water output. In most cases, water supply scarcity is experienced during the dry season when water flows on river beds decline.

Subsequent government from 2000 to date have played significantly role in the improvement of portable water supply to various communities in the kano greater area. Many water supply sources were constructed and some rehabilitated to ensure portable water supply apart from construction of new water treatment plants at Tamburawa and watari, thus, improving water supply significantly in the kano area. Before 2002, water supply was at 500million litre per day while as at now water production capacity is at 500million litres per day but still inadequate due to higher demand and population growth.

RECOMMENDATIONS

To alleviate the above mentioned problems related with water supply situation in Kano metropolitan there are needs for stakeholders, community and individuals to work together in order to achieve the objectives of the research:

- Government should disburse enough money to water resources sector so as to improve water supply and should as well focus most with the core Kano metropolis when tackling issues of water supply and scarcity
- Improving electricity supply and providing alternative sources of power to supplement electricity in order to pump the water to the consumers.
- Regular maintenances of existing water supply facilities.
- Individuals and organization must pay their monthly water dues so that the water board will have enough funds to efficiently supply water to the state.
- Training of man power. The Kano state water board and state ministry of water resources should embark on the training of man power by organizing seminar, workshop to increase their skills in water resources engineering, water resources management, hydrology and other related fields.
- Public enlighten campaign should be embarked in the mass media against misuse and over consumption of water, destruction of public properties and maintaining of existence water supply facilities.
- Application of water sanitation systems and security to ensure qualitative and adequate water to the people.

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APPENDIX 1 – INTERVIEW**An interview conducted with some staff of water board**

- a) What are the sources of water supply In the study area?
- b) What period of the year do you normally face the problem of water supply?
- c) What are the causes of the insufficient water supply?
- d) Is there any private partnership participation in water supply system in your study area?
- e) How do you manage your water?
- f) From 2000 to date what can you say about water supply system in metropolitan Kano?

**APPENDIX -2
INTERVIEW QUESTIONS
BAYERO UNIVERSITY KANO
DEPARTMENT OF GEOGRAPHY**

**INTERVIEW QUESTIONS IN PATTERN OF WATER SUPPLY INRELATION TO DIFFERENT WATER SOURCES
TO METROPOLITAN KANO**

SECTION A: DEMOGRAPHY OF RESPONDENT

Sex

Marital Status

Educational Qualification

Occupation

SECTION B: PATTERN OF WATER SUPPLY

1. What are your major sources of water supply?

(a) Borehole (b) Pipe-borne (c) Well (d) Water tankers (e) Water vendors

2. Why do you use your source of water supply?

(a) Income (b) Geological condition of an area (c) Flexibility\Convenience (d) Others

(3) Which type of water is conveniently used among the sources?

(a) Pipe-borne (b) Borehole (c) Well (d) Others

(4) What are the possible causes of insufficient supply of water?

(a) Geological nature (b) Blockages from pipes (c) Construction problem (d) Others

(5) Any assistance from the community on how to assist government in boosting of water supply in the state?

(a) Payment of water bills (b) Reporting to government on water supply issues (c) Construction\ Maintenance of water supply issues (d) Others

(6) What can you say about water availability since the year 2000?

(a) No improvement (b) Less improvement (c) Great improvement (d) Others.