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AN ASSESSEMENT OF SOCIO -ECONOMIC IMPLICATIONS AND COPING STRATEGIES OF WATER SUPPLY SCARCITY IN TUDUN WADA AREA, KADUNA STATE

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Abstract

The water scarcity is the serious problem of Tudun Wada reseidents in Kaduna State. Primary data was used in the research, questionaire was the instrument used in data collection from the respondent and simple descriptive statistics was used in data analysis such as table, percentage and so on.The research conducted find out that in the study area there is serious water scarcity which threat residents in several ways socially, economically and religiously. These problems of water scarcity resulted from population increase, climate change and poor government attitude. Hence, the Residents devised some means by which they minimize water scarcity problems in the area. The coping strategies employed includes water harvesting, minimized usage of water, storing water in big containers and trekking very long distance in fetching water.

Keywords: Water scarcity, Coping strategy, Water supply, Tudun wada

Introduction

Water is one of life's necessities that have no substitute. It is the life blood of the biosphere (Falkenmark and Rockstrom, 2004). Water is needed to support socio-economic activities such as agriculture, mining, food production and for maintaining healthy ecosystems. Water is one of nature's most important gifts to mankind. Essential to life, a person's survival depends on drinking water. Water is one of the most essential elements to good health, it is necessary for the digestion and absorption of food; helps maintain proper muscle tone; supplies oxygen and nutrients to the cells; rids the body of wastes; and serves as a natural air conditioning system. Health officials emphasize the importance of drinking at least eight glasses of clean water each and every day to maintain good health. Water is also a key component in determining the quality of our lives. Today, people are concerned about the quality of the water they drink. Although water covers more than 70% of the Earth, only 1% of the Earth's water is available as a source of drinking. Access to safe drinking water has improved steadily and substantially over the last decades in almost every part of the world.

In Nigeria, water scarcity is common virtually in all urban areas. The public water supply is unreliable, intermittent and in most cases inaccessible, thus giving rise to a high dependency on unsafe supplementary sources of water supply(Ocheri,2006) which are susceptible to water borne diseases, the most common being dysentery and typhoid fever. A survey conducted by the Federal Ministry of Water Resources in 2008 showed that about 80% of residents in Nigeria lacked access to improved drinking water (Ezenwaji et al, 2014).With the number of surface water bodies and groundwater resources available to the country, water shortages should ideally not be a problem for the nation. According to the World Health Organization (WHO, 2004), the total domestic water demand by man for domestic activities is estimated at 250 liters per capita per day. Life, health and hygiene all depend on an access to a quantitative and qualitative supply of drinking water. For this reason, the possibility of life (or man's) existing in any particular place depends on the presence or accessibility to water. The resulting polluted water contains protozoa, viruses, bacteria and intestinal parasites which cause water borne diseases (Thomas, 2005). The worldwide water issue made the United Nations general assembly in December 2003 to proclaim year 2005 to 2015 as the international decade for action "water for life" which was launched on the 22nd March 2005 by the then United Nations Secretary General Kofi Anan (UN, 2003).

Water scarcity is viewed as lack of water in relation to water requirements. The two forms of scarcity are often identified as physical (or environmental) and structural water scarcity. Physical scarcity refers to deficits in the natural availability of water and is a function of a combination of natural attributes, such as climate, hydrology, geomorphology, soils and vegetation, as well as human-induced physical modifications of these. On the other hand, structurally-induced water scarcity relates to the political-economy of resource allocation and the attendant institutional frameworks, structures and procedures for water governance, management, use and development. Distinction is made between "water

shortage‟ water scarcity", water stress‟ and "water security" (Falkenmark et al., (2007); Appelgren, (1998). According to Appelgren (1998), the term "water shortage‟ is used to describe an absolute shortage where levels of available water do not meet certain defined minimum requirements.

According to a study by Mangizvo and Kapungu (2010) aging equipment plays a role in water shortage. Equipment in the water provision system is dilapidated as a result of old age. The pump equipment has outlived the efficiency of its design and, as a result, the city council is incurring huge maintenance costs to keep them functional. Due to obsolete equipment, the water treatment plant is producing an average of 12,000m3/day instead of at least 18,000m3/day. In the same study by Mangizvo and Kapungu (2010) there are extensive leakages along the main pipe line that supplies water to the city from the water works. This resulted in the loss of approximately 30 percent of treated water. Water bursts were also being experienced in the oldest reticulation mains feeding the residential areas. According to Chigumira and Mujere (2009) the water system in had several underground leakages and small leak was estimated to put to waste more than 500,000 liters of water per year. These were all attributed to the age of the pipes. The aging equipment compromises the efficiency of the water supply system, meaning that water shortages were becoming a regular occurrence in the city of Harare. Another cause of water shortage is attributed to the power outages. Zimbabwe has been experiencing serious power shortages, which have resulted in power cuts, which have negatively affected the supply of water. The magnitude of the problem has worsened in Harare, as the water works could go without electricity for periods ranging from 6 hours to 18 hours on a daily basis (Mangizvo and Kapungu, 2010.

In Tudun Wada area, there has invariably been an increase in number of residents as well as increase in both domestic and economic activities, thereby causing more demand for water and exerting pressure on the limited resources, water inclusive. This has hampered the efforts to improve the pipe borne water supply of the area. This pipe-borne water inadequacy has led people to the use of other alternatives such as wells, buying water from vendors, construction of bore holes etc. It's the light of the above problem in Tudun Wada town that this study was motivated.

The aim of this research is to assess the causes and extent of water scarcity as well as coping strategies adopted by affected residents in Tudun Wada, Kaduna State. The aim will be achieved through the following objectives.

1. To establish the extent and causes of water scarcity in the study area.
2. To determine the strategies residents adopt to cope with water scarcity in the study area.
3. To investigate residents' perception of the causes of water scarcity in the study area.

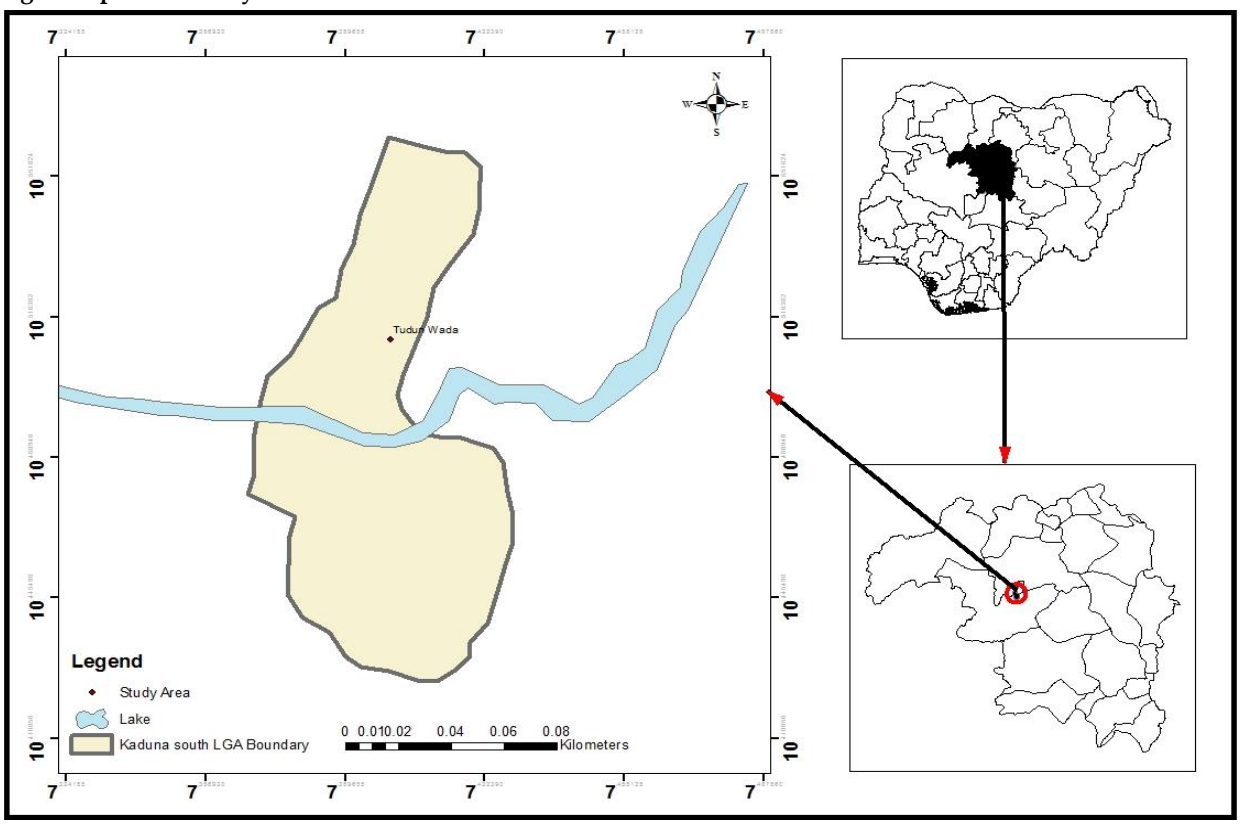
Materials and method

Tudun Wada district is located in Kaduna south local government area of Kaduna state. The area lies between Latitude 10º31'1.3188''N and on Longitude 7º25'50.0016''E The area is bordered to the North by Unguwan Sunusi, Unguwan Muazu to the south and Nnamdi Azikiwe Express by pass to the west and Tudun Nupawa to the south east. (Ministry of Land Survey, 2014).

The data was obtained through the structured questionnaires administer to seventy two (72) respondents (both male and female) in the study area, who were randomly selected. The Random sampling technique was used in the administration of the questionnaire. A Random sampling is a method of selecting a sample (random sample) from a statistical population in such a way that every possible sample that could be selected has a predetermined probability of being selected.

The questionnaire was design to elicit information on their socio demographic characteristics, causes of water scarcity, sources of water, distance covered to get water and the instrument (questionnaire) was also used to get information on the strategies respondents adopt to cope with water scarcity. The presentation and analysis of the data obtained through administering of questionnaire was presented using descriptive statistics which involve the use of, Frequency tables, Percentages.

Fig1. Map of the Study Area



Source; Kano University of Science and Technology, GIS LAB

Results and Discussion

Table 1. Source of Water during Dry and Rainy Season

Source	Dry Season		Rainy Season	
	Freq (F)	(%)	Freq (F)	(%)
Rain Water	0	00.0	26	19
Public Tap	15	20.8	31	22
Borehole	32	44.4	26	19
Hand Dug Well	09	12.5	14	10
From Neighbors	04	05.6	00	00
Water Vendors	12	16.7	03	02
Total	72	100.0	100	72

Source; Field Work, 2017

The water sources available to the respondents in the study area include public taps, boreholes, rainwater, hand-dug wells, from neighbors and water vendors. From table 1 above, findings show that Rainwater contributes about 26% in the rainy season, while this source contributes nothing in the dry season, primarily because of the absence of rainfall. About 31% and 20.8% of the respondents get water from public taps in the rainy and dry season respectively. Boreholes contribute 26% and 44.4% of water supply to the respondents in the rainy and dry season respectively. The results also show that 14% and 12.5% obtain water from hand-dug wells in the rainy and dry season respectively. Also, 00% and 05.6% of respondents get water from neighbors in the rainy and dry season respectively. The results also show that about 03% and 16.7% get water from vendors in the rainy and dry season respectively. This indicates that majority of the respondents depend on boreholes for water. It was observed that most of these boreholes were have their tap outside to enable people to have access to it.

Table 2. Causes of Water Scarcity

Causes	Frequency (F)	Percentage (%)
Inadequate Tap Water	20	28
Inadequate Well	02	03
Inadequate Borehole	04	06
Climate Change	17	23
Government Attitude	29	40
Total	72	100

Source; Field Work, 2017

The causes of water scarcity according to the respondents in the study area include inadequate tap water, inadequate well, inadequate borehole, climate change, government attitude. From table above, findings show that inadequate tap water contributes to about 28%, 03% and 06% of the respondents indicated that inadequate wells and inadequate boreholes causes water scarcity respectively. However, about 23% of the respondents indicated that Climate Change causes the scarcity in the study area because they believed that the scarcity is seasonal meaning it occurs mostly during dry season. Lastly respondents indicated that Government Attitude which account for the highest percentage of 40% is the major cause of the scarcity in the study area. And the respondents believed that if governments will look into the issue.

Table 3. Perception of Water Scarcity

Perception	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	F	%	F	%	F	%	F	%	F	%
Population Increase	32	44	20	28	11	15	09	13	72	100
Failure Of Tap Water Supply	32	44	33	46	03	04	04	06	72	100
Water Pollution	11	15	17	24	32	44	12	17	72	100
Poor Water Utilization	10	14	22	30	27	38	13	18	72	100
Increase Water Consumption	20	28	24	33	23	32	05	07	72	100

Source; Fieldwork, 2017

Generally, water scarcity is known to be caused by several factors such as, population increase, water pollution, and poor water utilization, among others. From the above table shows summaries of the results obtained on the perception of water scarcity in the study area. The findings show that 44% of the respondents strongly agreed and 46% agreed that failure of public water supply system is the causes of water scarcity in study area. However, 04% and 06% disagree and strongly disagree respectively. Populations increase/is also noted to be responsible for water scarcity in the study area as indicated by 44% and 28% of the respondents who strongly agreed and agreed respectively. However, 15% and 13% of the respondents disagreed and strongly disagreed respectively. Water pollution/is also noted to be responsible for water scarcity in the study area as indicated by 15% and 24% of the respondents who strongly agreed and agreed respectively. However, 44% and 17% of the respondents disagreed and strongly disagreed respectively. Poor water utilization is also noted to be responsible for water scarcity in the study area as indicated by 14% and 30% of the respondents who strongly agreed and agreed respectively. However, 38% and 13% of the respondents disagreed and strongly disagreed respectively. Increase Water Consumption also noted and indicated 28% and 33% of the respondents strongly agree and

agree respectively, however, 32% and07% of the respondents disagreed and strongly disagreed.

Table 4. Coping Strategy

Coping Strategy	Frequency (F)	Percentage (%)
Walking Long Distance To Get Water	15	21
Water Harvesting	07	10
Dredging Dried Hand Dug Wells	06	08
Minimizing Water Use	18	25
Storing Water In Big Container	26	36
Total	72	100

Source; Field Work, 2017

The findings reveal that 21% of the respondents walk long distances to getwater. Rain water harvesting is another strategy employed by some residents to cope with scarcity as indicated by 10% of the respondents. Water is collected and stored in big containers for feature use during the scarcity period. Again 25% of the respondents indicated that they minimize their use of water as a way of coping with water scarcity. And about 08% of the respondents indicated that they dredged dried hand dug wells time to time. Hence, water is crucial it is conservation and good management is necessary to ensure it is sustainable usage.

CONCLUSION

This research concludes that there is a serious water scarcity problem in Tudun Wada area of Kaduna South, Kaduna State; hence residents have devised strategies to cope with the situation. Their efforts however have not sufficiently helped to solve the scarcity problem. The consensus among majority of the respondents is that water scarcity is caused mainly by the failure of the public water supply system as a result of government attitude.

Moreover, the problem of water scarcity leads to many problems such as outbreak of diseases lateness to school for students and lateness to work for workers, it also lead to misunderstanding between many people.

REFERENCES

Abaje, A. (2009). Nature of Potable Water Supply and Demand in Jema'a Local Government Area of Kaduna State, Nigeria. *Research Journal of Environmental and Earth Sciences*, 1(1) Pp. 16-21

Appelgren, B and Klohn, W. (1998). Management of Water Scarcity: A Focus on Social Capacities and Options. *Land and Water Development Division*. Food and Agricultural Organisation of the United Nations, Rome: Italy.

Aroka, N. (2010). Rainwater Harvesting in Rural Kenya: *Reliability in a Variable and Changing Climate Department of Physical Geography and Quaternary Geology, Stockholm University*.Associated Press (2008) Zimbabwe Faces Water And Cholera Crisis.

Chigumira, E. and Mujere, N. (2009).*Variability Of Urban Water Supply and Demand*.In J.

Clarion University of Pennsylvania, Clarion, Pennsylvania

Ezenwaji, E.E., Anyaeze,E., Otti, V.I. and Obienusi, E.A. (2014).Mainfestations of water supply shortages and implication for rural development in Anambra state, Nigeria. *Journal of Environmental Sciences and Water Resources*. 3(7), pp: 149-155.

Falkenmark, (2007). World freshwater problems: Call for a new realism. *Background paper for the Comprehensive Freshwater Assessment*.Stockholm Environment Institute (In press).

Mangizvo, R. and Kapungu, N. (2010) urban water crisis in Zimbabwe: Case study of Kadoma. *Journal of Sustainable Development in Africa* (Volume 12, No.8, 2010) ISSN: 1520-5509.

Swaminathan, M.S (2001). Ecology and Equity: Key Determinants of Sustainable Water Security. *Journal of Water Science and Technology*, 43(4), Pp. 35-44

UN- Water (2007). *Coping with water scarcity-challenge of the 21st century*. World Water Day,2007.

WHO (2004) Joint Monitoring Programme for Water Supply and Sanitation,