



SOCIO-ECONOMIC EFFECTS OF SEASONAL DOMESTIC WATER SUPPLY AMONG KIBAKU PEOPLE, CHIBOK LOCAL GOVERNMENT AREA, BORNO STATE, NIGERIA

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ABSTRACT

Water is an essential commodity which affects life and livelihoods in the universe. This study examined the socioeconomic effects of seasonal domestic water supply among Kibaku People, Chibok Local Government Area, and Borno State, Nigeria. Random sampling was used to select 165 rural households and water samples for the study. Data collected were analyzed using descriptive and inferential statistics. The significant water sources were hand dug well. The average trekking time to the water source was 10-101 minutes (24.8%). And the households require an average of 162 liters of water per day. The major causes of water scarcity include insufficient rainfall, increased sunlight intensity, pollution of water sources and increased population from the oral interview. About 60% of them stated water scarcity harms their socioeconomic activities as its time consuming (36.1%), causes long queues (48%) and causes conflicts at the point of collection (15.8%). However focus group discussions, interviews and personal observation, respondents believed drinking water is inadequate in Chibok. It was concluded that water available for household use is not sufficient. However, it is safe but contains some elements, not of the World Health Organization standard for good potable water. It is recommended that the community build a hub for water collection and distribution close to the village center. The government should provide water infrastructures to increase the potable water supply.

Keywords: Access to water, dry season, rural areas, Sources of Domestic water, water scarcity, water supply

INTRODUCTION

Water scarcity is the shortage of water resources to meet the water usage demands within a region Ali Scott Vitkovic and Daryoush Soleimani (2015). Water is the essential natural resource for sustainable development and quality of life, and access to it is a fundamental human right (Organisation of Islamic Cooperation, 2021), yet it is unevenly distributed; almost one-fifth of the world's population lives in regions where water is scarce, and one-quarter suffer from severe water shortage (Liangxin Fan et al., 2013). Water stress increased globally from 15.7% in 1997 to 18.5% in 2017. It also increased significantly in OIC countries, from 24.8% to 32.7% over the same period. At the moment, the OIC group is classified as a water-stressed region. According to UN-Water & FAO (2018-Research by Liangxin Fan (2013) revealed that most countries experiencing water stress are in arid and semi-arid regions where water resources are scarce. He thus stated; that, at the sub-regional level, most countries in MENA and ECA regions face severe water stress, and most OIC sub-regions are expected to experience an increase in water stress of at least 1.4 times by 2040. Given the benefits they provide, it is critical to protect and restore water-related ecosystems. According to the research, water bodies in OIC countries showed a sharp decline, with their area falling from 1.77% (of total land area) in 2005 to 1.70% in 2018. This corresponds to approximately 2.7 million hectares of lost water bodies, an area roughly the size of Albania. In comparison, water bodies worldwide decreased slightly during the same period, from 2.15% to 2.14%. One method for preserving water resources is to protect and restore water-related ecosystems. Increasing water bodies would mean growing catchment and reservoir capacity in the region. As put forward by (the Organization of Islamic Cooperation, 2021), that water stress worsens over time as water demand rises due to population growth and shifting consumption patterns. As of 2000, it was evaluated that one-sixth of

humanity (1.1 billion people) lacked access to upgrade water supply within 1 kilometer of their houses (WHO and UNICEF, 2000). Deficit access to safe and adequate water supplies contributes to ongoing poverty through the economic costs of poor health and the excessive part of family expenditure on water supplies in many poor groups, arising from the need to purchase water and time and energy expended in the collection. Access to water services is crucial in developing countries' UNDP Human Poverty Index (UNDP, 1999). From the socioeconomic perspective, water scarcity impacts arise when the difficulty of obtaining water forces a change in consumption. For instance, abundant snowmelt may be of little use to would-be farmers if barriers (cost, institutional, etc.) prevent them from utilizing it. They will be forced to go elsewhere for water or engage in other activities, and this bears a socioeconomic cost that is not reflected in conventional water scarcity metrics. When water becomes a binding constraint, societies adapt through trade and shifting patterns of production, and the cost of that adaptation is tied to the difficulty of adopting needed changes. Changing annual cropping patterns to conserve water is more accessible and will impact an economy less than shuttering thermal power generation during prolonged drought. In a globalized economy, the impact of such adaptation cannot be assessed in a single basin or sector in isolation, as hydrologic changes in one region reverberate across industries around the world. Indeed, reductions in water supply in one area may increase water demand in another, simultaneously inducing both physical scarcity and economic benefit in ways that are difficult to anticipate ex-ante (Adetayo, Ibiyinka, Abiodun, Felicia, Oluwa damilola and Olubukola, 2019). When water is scarce, the persons who collect and carry water — usually women and children- must travel long distances and carry cumbersome loads.

This results in injuries to their bodies. Receiving water often takes so much time and strength that they and their families use much less water than they would if it was plentiful. The search for water can bring so much time that the other work women do to support family health, including caring for children and tending crops, does not get done. (Lewis, 2009), stated that the implications of Lack of clean water and access to adequate sanitation are widespread. Young children die from dehydration and malnutrition, agonizing from diarrheal sickness that could be averted by clean water and good hygiene. Infections such as cholera are straight out rampant during the wet period. Women and young girls, who are the main role-players in obtaining and bringing up water, are precluded from doing income-generating work or attending school, as most of their day is often spent walking miles for their daily water needs. These affect their contributions to normal socioeconomic activities. They also have a high risk for violence since they travel such great distances from their villages daily and are even at risk when they must go to the edge of the town to find a private place to relieve themselves. More attention is put on women because they take the central role in the collection, management and use of water, as well as general sanitation of the household (Fong et al., 2003). According to (Zemenu, 2012), ample evidence indicates that more active involvement of women can optimize the results and impacts of rural water supply service. According to Bwala (2014), there is inadequate water supply in rural areas, which affects their socioeconomic lives. African women and men's divergent social positions result in differences in water responsibilities, Rights, and access, so the scarcity of clean drinking water disproportionately burdens African women. In most African communities, women are seen as the receivers, managers, and defenders of water, especially within the domestic sphere that includes family chores, cooking, washing, and child-rearing. Because of these traditional gender labour roles, women are forced to spend around sixty per cent of each day receiving water which translates to about 200 million collective work hours by women worldwide per day and a decrease in the amount of time available for education. Water scarcity exacerbates this issue, as indicated by the correlation of declining access to water with a reduction in women's combined primary, secondary, and tertiary enrollment (Wikipedia, 2016).

Africa is home to the most significant number of water-scarce countries and the most challenging countries to reach regarding water aid. The universality of rural villages traps many areas in what the U.N. Economic Commission for Africa refers to as the "Harvesting Stage", which makes water short regions hard to aid because of a shortfall of industrial technology to complete solutions for today and future generation. Moreover, to the geographic and developmental limiting factors, several political and economic rationales also

stand in the way of certifying adequate aid for Africa. Politically, tensions between local governments and foreign non-governmental organizations

Impact the ability to successfully bring in money and support workers. Economically, urban places suffer from major wealth space in which the profuse poor often pay four to ten times more for hygienic water than the elite, hindering the poor from gaining access to clean water technologies and efforts. As a result of all these elements, it is estimated that fifty per cent of all water projects fail, less than five per cent of projects are visited, and less than one per cent have any long-term monitoring. In addition, it has been reported that underprivileged urban populations pay exorbitant amounts of money for water, which is often unsuitable for consumption. In contrast, resources allocated to those living in wealthy urban areas are heavily subsidized, meaning the rich pay less for cleaner water and better sanitation systems (Fotso *et al.*, 2007). In Nigeria, many rural areas are faced with water scarcity and the households in the communities rely on self-water supply for domestic, irrigation and socioeconomic purposes. Water scarcity does not only affect the households' domestic use, but it also has an impact on their socioeconomic activities. The output of socioeconomic activities can be affected directly or indirectly. Water as an input can increase the running cost of socioeconomic activities due to water scarcity. In this view, it is imperative to examine the effect of water scarcity on the socioeconomic activities of the rural households in the study area. Several studies have investigated either Spatio-Temporal Challenges of Domestic Water Supply, Analysis of The Demand and Supply of Water, Application of Electromagnetic (E.M.) and Resistivity Method in Ground Water Exploration (Bwala 2014, Dzarma 2012, Mijinyawa 2010), but socioeconomic effects of seasonal domestic water supply not many. *Therefore, this study examined* the socioeconomic impact of seasonal domestic water supply among Kibaku People, Chibok Local Government Area, Borno State, Nigeria. The following objectives, therefore, guided this study: -identify the available water sources in the study area; - examine the accessibility of the water sources and their procurement; - identify the causes of water scarcity in the study area; - ascertain the effect of water scarcity on the households' livelihoods.

MATERIALS AND METHOD

Study Area

The Chibok Local Government lies between Latitude 100.30' and 110 .00' North and Longitude 120. 0'13.00' East. It is located in the Southern part of Borno State and bounded to the North by Damboa Local Government Area, to the East by Gwoza local government and to the South by Askira/Uba local government Area. It occupies an area of 1350km² (130sq.Mil.), Maiva (2019).

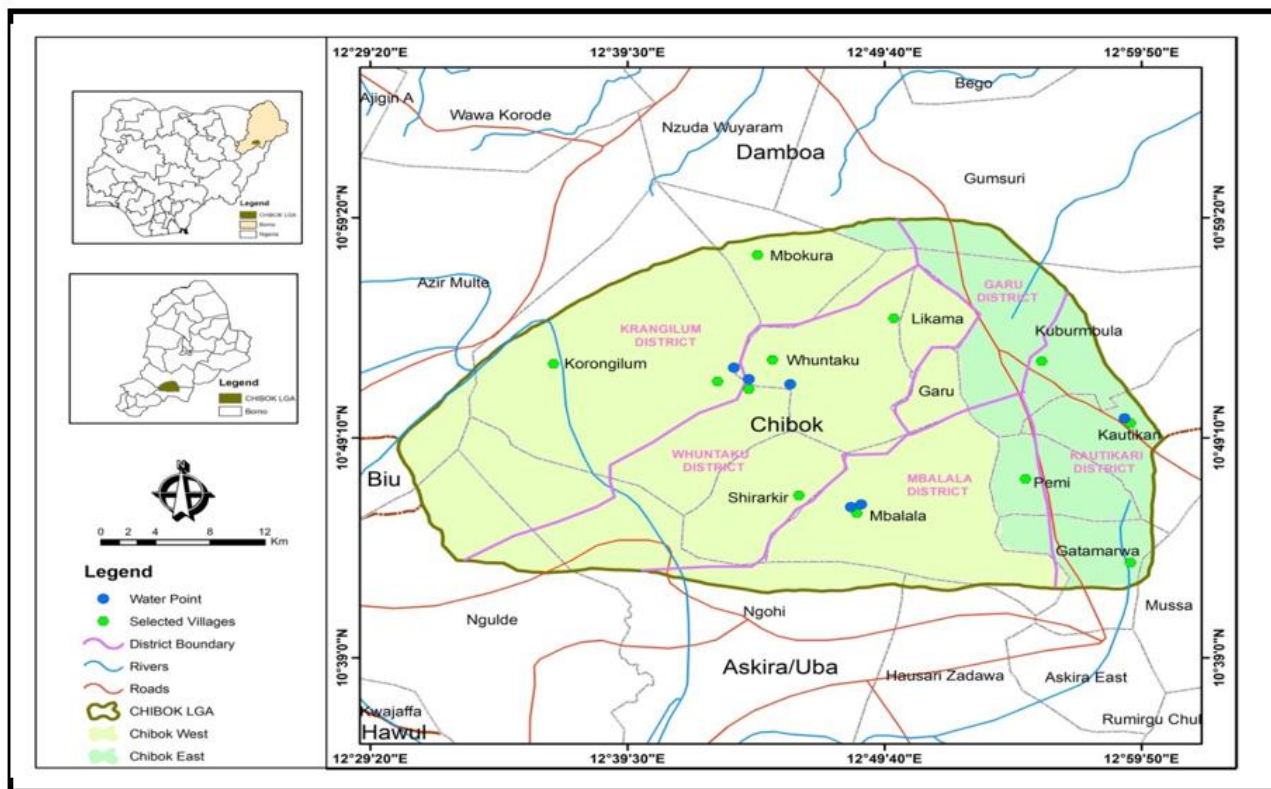


Figure: 1 Map of the study area
 Source: Modified from Ministry of Land and Survey

METHODOLOGY

Random sampling technique was used to pick the respondents for this study. Respondents were randomly selected from the four (4) districts of the Chibok local government area. One hundred sixty-five copies of questionnaires were administered to households spread across the four (4) districts. In addition, focus group discussions were also used to generate data from residents, and water vendors were interviewed in some areas of the selected districts. Data obtained from the study were analyzed using descriptive statistics of frequency counts and percentages and inferential statistics. Data collected were computed and analyzed using SPSS.

RESULTS AND DISCUSSION

Occupational Distribution

The findings show the occupation of the respondents. As shown in Table 1, the main work of the respondents in the area was farming, with Kautikari having the highest (84.9%) followed by Mbalala district with 42.4%. On the other hand, Garu district has the highest number of civil servants, with a proportion of 60.6%, followed closely by Whunatuku district at 57.6%. This was because both Garu and Whuntaku were in the Chibok head Quarters where most of the government establishment and commercial activities take place.

Table 1: Occupational Distribution

Occupation	District of a Respondent				Total	%
	Garu	Whuntaku	Mbalala	Kautukari		
Farmers	11	9	14	29	63	47.7
Business	2	5	8	1	16	12.1
Civil servant	20	19	12	3	54	40.2
Grand Total	33	33	34	33	133	100

Source: Field Survey, 2020.

Family Size

A household is a category of people who make quality supplies of food, water, shield and other necessities for survival (Population Facts, 2017). Family size influences the water consumption of many households; therefore, information about the family size of the respondents is necessary. The majority (58. %) of the respondents' homes in the study area were within the family size of 6-10, as shown in Table 1. Garu and Whunatku districts have a family size of six to ten persons per household. Households with three to five persons, which constitute 42.4%, follow these. Population facts (October 2017) submitted that the large

average household sizes of more than five persons per household were observed across most of Africa and the Middle East. General Household Survey-Panel Wave 3 (Post Planting) 2015-2016, National Bureau of Statistics – Nigeria (2016), stated that the average household size in Nigeria is 5.9 and 4.9 persons in rural and urban areas, The daily water needs of households with larger family sizes would be much compared to homes with tiny family sizes and the effects on the socio-economic activities. The total cost of water or burden on the person primarily fetching water (women or children) would be much. The total cost of water in households with large family sizes could be higher, especially

if vendors are the principal water suppliers. To reduce the financial burden on the home, each family member is compelled to use less water per day or travel a distance to source water to use, which affects the family's socio-economic activities. This also agreed with what is obtainable in Chibok according to the responses obtained from the respondents through oral interviews and focus group discussions carried out by the researcher in the study area.

Time Taken to Source Domestic Water

Time is an essential resource, and it affects every activity of man. The time taken to source water by residents of Chibok was one of the factors that influenced their everyday and socio-economic activities. Figure 2 revealed the estimated time taken to domestic water sources by the respondents in the study area. In the table, Mbalala has the highest number of persons, 60.6% of residents of the study area, who indicated that they travel less than 50 minutes to their water source. Those that take 51 to 100 minutes were 31.3% in the Whuntaku district. This is above the maximum time required for anyone to trek to the source of domestic water, as stated by WHO (2002). Plate 1, Showed people queuing and waiting to fetch water.

When water comes from qua; quality and accessible sources, people spend a minimum duration and whack physically receiving it, meaning they can be productive in other ways and enhance their socio-economic activities. This can also result in excellent personal safety by reducing the need to make long or risky journeys to collect water. Better water sources also mean less expenditure on health, as people are less likely to fall ill and incur medical costs and are better able to remain economical (Kumar, 2005). According to (the WHO / UNICEF Joint Monitoring Programme (JMP) 2010), in poor settings, the time of the day spent on the search for water has significantly increased in the past decade. This, coupled with sociocultural practices, has transferred the burden of fetching water to poor women and girls in poor settings. In 2007, it was estimated that women and girls brought water 4-6 times daily in most Kenyan cities. This translated to 112 minutes the poor households spent searching for water per day. This usually increased to 200 minutes during times of scarcity. Sphere project (2017) submitted that an Excessive lineup indicates insufficient water availability due to either an inadequate number of water points or low yields at water sources. This is evident in Mbalala District, as shown in plate1.

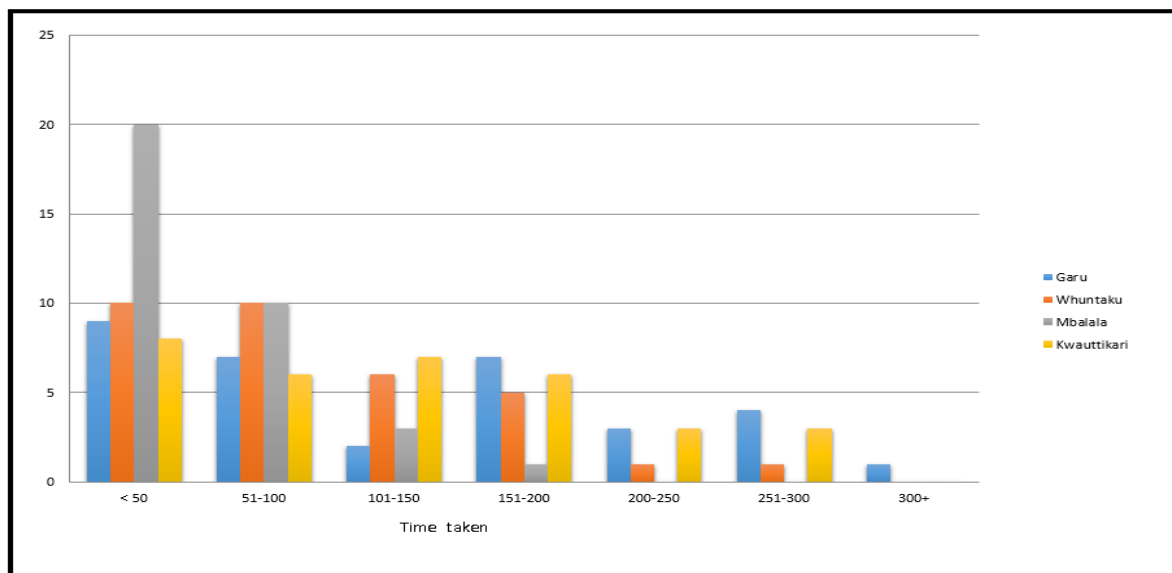


Figure 2: Time taken to sources of water
Source: Field survey 2022



Plate 1: Showing people queuing and waiting for their turn to fetch water at Mbalala District.
Source: Field survey 2022

Distance, Accessibility of the Water Sources and its Procurement

Everyone has the right to water services that are physically accessible within or near their household, workplace and educational or health institutions. According to (WHO, 2010), the water source must be within 1,000 meters of the houses and receiving time should not exceed 30 minutes. Figure 3 shows that most of the residents of the study travelled more than 1000 meters to access domestic water. More than that, the collection of data resulting from oral interview revealed

that accessing domestic was a severe nightmare in the study area as the residents may spend the whole day waiting for their turn to fetch water; plate one show people queuing and waiting for their turn to bring water at Mbalala District to attest that claim. For those that may want to buy from water vendors, it is another big challenge in the study area as not many are involved in the business. So the few that are interested cannot satisfy and meet the water demand of the people moreover is caused as each jar can (i.e. 20 litres jar can be caused N30).

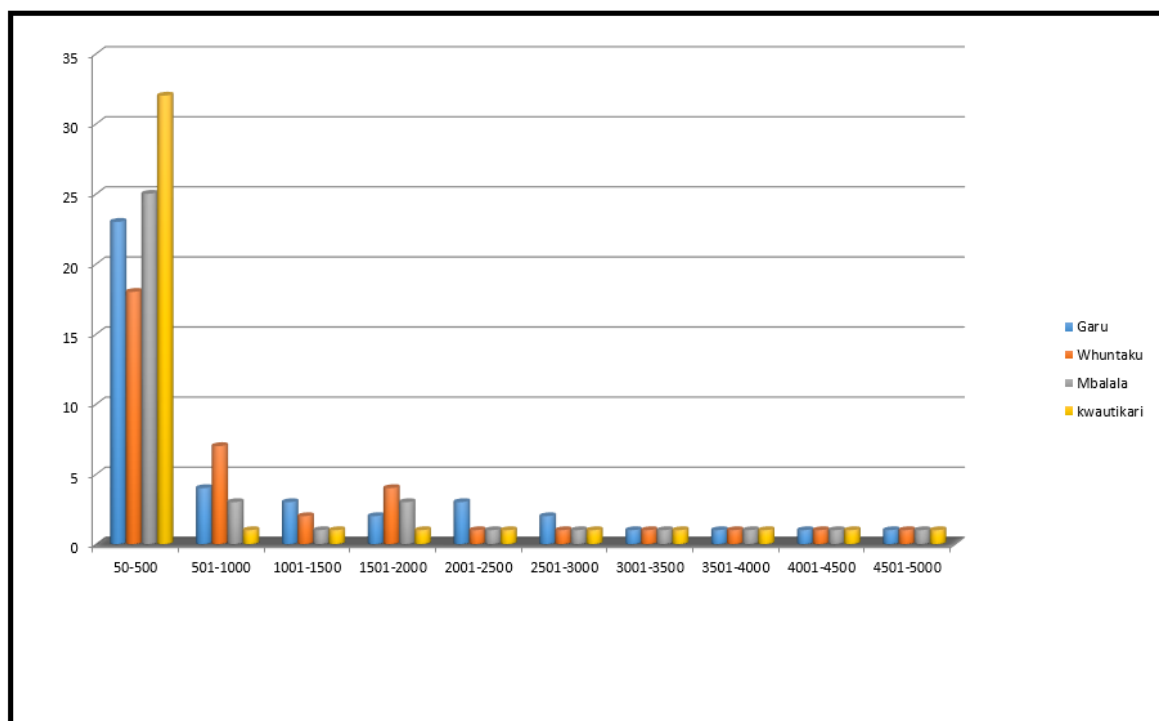


Figure 3: Distance taken to access domestic water
Source: field survey 2022

Spatial Distribution of Water Points of the Study Area

Figure 2 shows the GPS water points of the study area. From the figure, wells were the most dominant sources of water in sampled areas, followed by a borehole; some of the water

points shown on the map could not be seen because of their closeness of them to each other, and due to the map scale and size of points –indicators used here. The available water sources in a given community are directly proportional to

their socio-economic activities. Close observation of the Spatial distribution of water points in the study area revealed that there are very few water sources in the study area, this can lead to a serious struggle for water at the end of collection by that sourcing water.

Spatial Distribution of Water Points of the Study Area

Figure 4 shows the GPS water points of the study area. From the figure, wells were the most dominant sources of water in

sampled areas, followed by boreholes; this agreed with table 10.5, which gathered that the primary water source for the study area was wells. However, some of the water points shown in the map could not be seen because of the closeness of some of them to each other and due to the map scale and size of points –indicators used here.

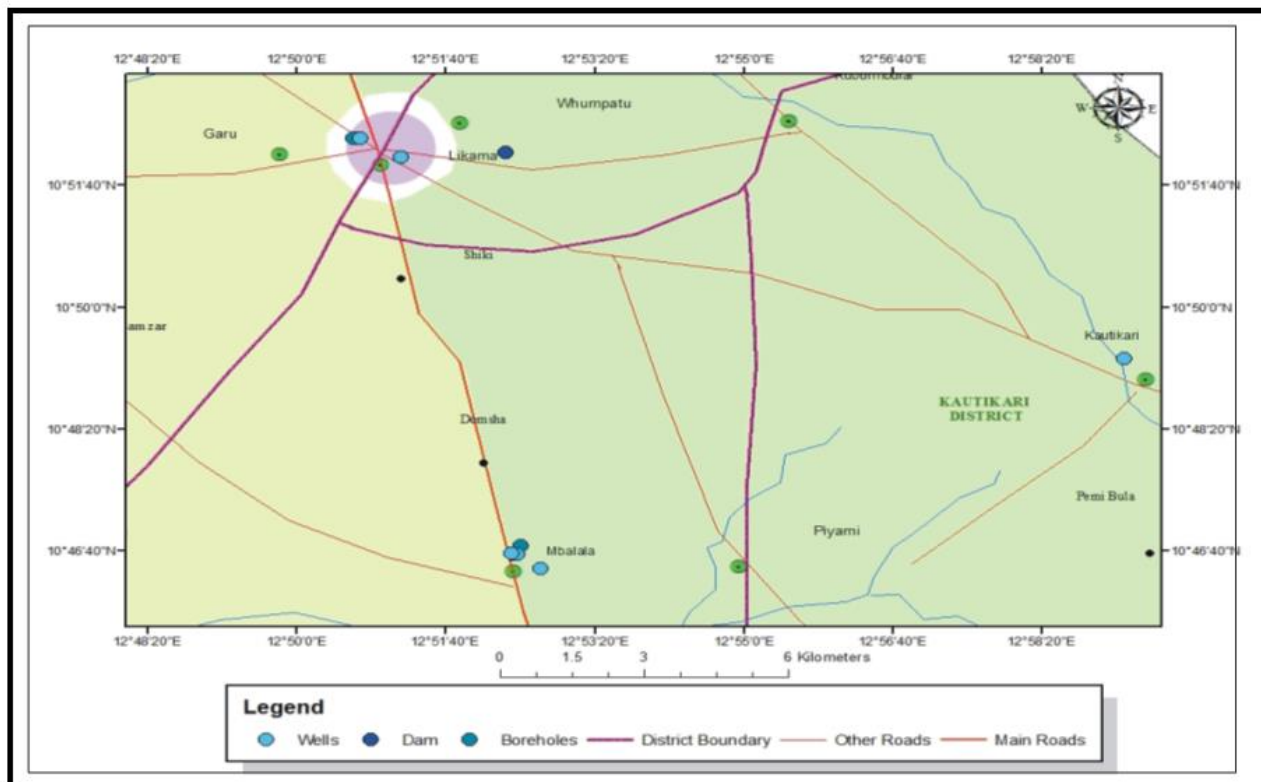


Figure 4: GPS Water Points of the Study Area
Source: Field Survey, 2022.

Causes of Water Scarcity in the Study Area

Table 2 shows that most of the respondents indicated that poor recharging of their water sources was the cause of water scarcity in the area. Mbalala has the highest percentage of 63.6%, and Garu and Kautikari followed closely with 60.6%. The next factors that followed this were over Population with 39.4% and 27.3% from Whuntaku and Garu, respectively; this was because of the influx of people from the surrounding

villages into Chibok central because of the security challenges. Information gathered from oral interviews: residents complained of underlying rocks in most places in the study area. In contrast, some complained that the Population of the residents was more than the number of available water sources in the area. Some of the residents stated that the number one factor is negligence from the government.

Table 2: Factors Responsible for Domestic water Scarcity during dry session in Chibok

Factors responsible for Scarcity of Domestic Water	District of a Respondent				Total	%
	Garu	Whuntaku	Mbalala	Kautikari		
Poor recharging of Well	20	10	21	20	71	53.4
Over Population	4	10	6	10	30	22.6
Negligence from Government	9	13	5	3	30	22.6
Underlying Rock	0	0	2	0	2	1.5
Total	33	33	34	33	133	100.1

Source: Field survey2022

Information gathered from oral interviews revealed that there were times that the residents were unable to get even poor-quality water due to seasonal variability, mainly during the extended dry period. They dig sediment in dried river plains to find water for drinking. The researchers’ field observation and interviews of the much household also proved that they spend most of their time looking for drinking water instead of

participating in different economic activities. This was in line with the finding of Cherutich et al. (2015) and Luis et al. (2002), which states that low access to drinking water would affect the livelihoods of the society, and it is challenging to break the vicious circle of poverty (Kerstin and Cara 2012).

Effects of Domestic Water Scarcity on the Socio-Economic Activities of the Community

Table 3 seeks to know the water supply situation in the sample areas. All four districts responded that the study area suffered water scarcity, with Garu district having the highest percentage of 100%. From oral interviews, it was gathered that in most study areas, the residents have to suspend other activities for hours to get water that they could use to cook. Others submitted that sometimes they find it challenging to prepare their evening meals because of a lack of water. This

agrees with the (WHO 2007) that the water supply situation in rural areas is worse than in urban areas. These have adverse effects on the socio-economic activities of the community as people in the study areas can't boast of constant standard sources of water supply in their area. Most rural domains do not have access to good quality water; as such, they depend on traditional water supply sources such as rain, springs, streams, ponds and hand-dug wells, whose quality is doubtful.

Table 3: Effects of Domestic Water Scarcity on the Socio-Economic Activities of the Community

Difficulties face in accessing Domestic water during dry season	District of a Respondent					Total	%
	Garu	Whuntaku	Mbalala	Kautikari	Total		
Time consuming	5	3	13	27	48	36.1	
Length of Queue	25	13	20	6	64	48.1	
Conflict	3	17	1	0	21	15.8	
Total	33	33	34	33	133	100	

Source: Field survey, 2022.

From oral interviews, it was assembled that in most places in the study area, hand-dug wells dry up before the next rainy session, and as such, they were left with the option of going to streams or buying from water tankers. Some respondents complained of difficulty getting water tankers or water vendors when needed. Sometimes, customers had to follow them to the extraction point (a stream in the town). According to some residents interviewed, the number of water vendors in the area was inadequate to allow for sufficient water supply to various households at appropriate times and quantities.

CONCLUSION

The study has found that rural households are negatively affected by water scarcity primarily in their socio-economic activities due to increased expenses in acquiring water, energy and time consuming to obtain it, and inability to meet the required available water for their livelihoods. In addition, climate-related factors such as insufficient rainfall and high sunlight intensity were stated to cause water scarcity, while beneath rock cannot be neglected. The available water for households in the study area is inadequate and contains some impurities that are not of the World Health Organization standard for good potable water. Therefore, the government and NGOs should provide more water infrastructures and increase the safe water supply to generate a wide range of potential benefits for individuals, households, and communities.

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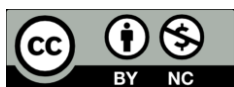
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