

Current Status and Problems of Potable Water Supply in Damagum Township of Fune Local Government Area, Yobe State, Nigeria

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Abstract – The study was conducted between the months of January – February, 2018 to study the current status and problems of potable water supply in Damagum town of Fune Local Government Area, Yobe state, Nigeria with specific objectives of assessing the common sources of water supply in the area, to evaluate the level of government participation in the provision of potable water supply and to assess the common problems of potable water supply in the area. A total of six areas with a population of 20,300 were randomly selected for the study including Sabon Layi, Low Cost Estate, Indabo, Bakate, Ihunka Banza and Makara Huta. A Descriptive Survey design using both qualitative and quantitative methods was used involving 360 local residents selected using Purposive, Convenient and Systematic Random Sampling methods. A closed ended researcher made questionnaire was used to collect quantitative data while structured Interview Guide was also used to get some qualitative data. Scientific Package for Social Sciences (SPSS) Version 20 was used to analyze quantitative data using Descriptive Statistics. Findings on characteristics of the respondents showed a higher male participation (73.1%), dominant ethnic groups were Kanuri, Hausa and Kare Kare with 22.8%, 21.9% and 22.5% respectively. Majority of them were married young men of ages between 25 – 45 years (66.1%). Crop farming, civil servants, traders and those engaged in handy works such as carpentry were found to be the most dominant with 28.3%, 17.2%, 16.9% and 27.0% respectively. More than half of the local residents (59.5%) had only Arabic or primary education. From all the six areas studied only 16 sources of communal water supply were identified including 9 commercial tube wells, 4 government provided bore holes and 3 other bore holes made available by some NGOs. Sources of water supply common in the areas were tube wells and bore holes no wells were identified. Government participation in the provision of potable water supply in the area was found to be grossly inadequate while problems associated with water supply were found to be numerous ranging from heavy expenditure in water purchase, serious shortage of water supply, insufficient water supply sources, poor sanitary conditions and so on. The continuous prevalence of these problems can lead to serious social, economic, health, educational as well as political repercussions thus, it was recommended that more solar powered bore holes should be constructed, more other sources of water supply be made available as well as public enlightenment on the need to use water management and maintenance techniques as well as water purification techniques be embarked upon.

Keywords – Current Status, Damagum, Potable Water Supply, Problems.

I. INTRODUCTION

Water has been viewed as the global common heritage and everyone should, albeit effectively have an inalienable social and political right to it. However, freshwater shortage has been noticed around the globe. The challenges of water supply have contributed a factor inducing conflicts in some parts of the world because the earth's freshwater is diminishing due to man's activities and climate change [8]. Access to drinking water is a critical global issue. What constitutes water access? The currently accepted definition comes from the United Nations as outlined in 2000. This UN definition focuses on 3 distinct measurable characteristics of drinking water sources; (1) The quantity of water, (2) The safety or quality of water and (3) The distance for collecting water. The World Health Organizations (WHO) recommended 120 liters of water per person daily to meet domestic utilization and function effectively.

Water supply is the provision of water by public utilities, commercial organization, community endeavors or by individuals, usually via a system of pipes and pumps. In 2010, about 85% of the global population (6.77 billion people) had access to piped water supply through house connections or to an improved water source through other means including standpipes, water kiosks, spring supplies and protected wells. However, about 14% (884 billion people) did not have access to an improved water source and had to use unprotected wells or springs, canal, lakes or rivers for their water needs [8]. A clean water supply in particular water that is not polluted with fecal matter from lack of sanitation is the single most important determinant of public health. Destruction of water supply and/or sanitation infrastructure after major catastrophes (earthquakes, floodwater etc) poses the immediate threat of severe epidemics of water borne diseases, several of which can be life threatening.

Water supply systems get water from a variety of locations after appropriate treatment including groundwater (aquifers), surface water (lakes and rivers) and the sea through desalination [10]. The significance of water to humans and other biological systems cannot be over emphasized and there are numerous scientific and economic facts that, water shortage or its population can cause severe

decrease in productivity and deaths of living species [3]. Reports by Food and Agriculture Organization (FAO), revealed that in African countries, particularly Nigeria, water related diseases had been interfering with basic human development [3]. The common sources of water that are available to local communities in Nigeria are fast being severed by a number of anthropogenic factors of which pollution remains the most dominant problem. Although the demand for fresh water is fast increasing at a rate greater than the world's population growth, access to safe water supply is a serious issue across the globe. Recent statistics indicate that 1.2 and 2.4 billion people suffered from lack of safe water supply and secure sanitation respectively [3]. In many developing countries, Nigeria in particular, more than half of the population is affected.

II. BACKGROUND

Although the demand for freshwater is fast increasing and at a rate greater than the world's population growth, access to safe water supply is a serious issue across the globe. Recent statistics indicates that 1.2 and 2.4 billion people suffer from lack of safe water supply and secure sanitation respectively [3]. In many developing countries including Nigeria, more than half of the population is affected. Another report by the [9] indicates that nearly 3 billion people or 40% of the world population live in water stressed countries where it is difficult to get enough water to satisfy the basic human needs. The report also indicates that many countries have fallen short of the Millennium Development Goals (MDGs) target of reducing by half the proportion of people not having access to safe water supply by 2015. According to the same report, in 6 developing regions of the world, namely; Sub-saharan Africa, Oceania, Latin America, South East Asia, Southern Asia and Northern Asia, vast proportion of the rural population still lack adequate access to safe water supply [10]. The situation further worsens the living standards of the people in the regions and constraints socio-economic development of the rural economy.

According to World Health Organization (WHO) and UNICEF, 2008, the African population without access to improved drinking water sources increased by 61 million from 280 million in 1990 to 341 million in 2006. Increase in coverage not keeping pace with population growth. It also indicated that the rate at which Africans gained access to improved drinking water sources, 245m people since 1990, falls short of that required to meet the MDG drinking water target; in 9 countries in Africa, access to improved drinking water sources is less than 50%; urban drinking water coverage in African is 85% while that of rural area is 51%. Besides, according to same report, to meet the MDGs drinking water target, coverage needs to increase from 64% in 2006 to 78% in 2015.

Despite the fact that Nigeria is blessed with a vast water resources, 90 million of its people living in urban and rural areas lack access to improved drinking water sources; and that Nigeria ranks behind many other developing countries in sub-Saharan Africa in level of access to potable water. The UNICEF [9] report indicates that currently only about

31% of the rural population has access to water of acceptable quality. In some urban and rural areas in the country, the effective coverage may be as low as 40% and 20% of the population respectively [10].

In recent years due to increase in population and urbanization, the provision of safe and portable water to the Nigerian public has been on steady decline in terms of service quality and distribution. Access to water in Nigeria was 47% in 1990 but rose slightly to 54% in 2010 while the national statistics coverage from 2010 was just 32%. Recently, it has been estimated that only 58% of the masses have access to potable water that is, 87m people while 63m people are sidelined [8].

III. STATEMENT OF THE PROBLEM

In recent years, due to increase in population urbanization and climate change as well as other anthropogenic and natural factors, the provision of safe and potable water to the Nigerian public has been on steady decline in terms of adequacy, quality and quality of service [2]. In Nigeria today, the freshwater sources available to the local inhabitants are either unsafe or difficult to obtain and are severely stressed by poor management. This makes access to clean water a serious problem. Access to water was broadly defined as the availability of at least 20 liters per person per day from a source within one kilometer of the user's dwelling. In some instances, women and children need to walk for hours to fetch ordinary drinking water. These problems are more prominent and severe in rural areas than in the urban centers. Distribution is a critical problem as far as the provision of safe and potable water supply is concerned in most developing countries including Nigeria. This is because the physical landscape in addition to poor technology has made it difficult to evolve, operate and maintain an effective distribution system for public water supply. Moreover, diarrheal diseases are endemic in countries where the water and sanitation infrastructure is deficient especially in most developing countries.

However, the good news is that since 1990 well over 2 billion people have gained access to improved sources of drinking water, and 116 countries have met the MDG target for water. Almost 2 billion people gained access to improved sanitation and 77 countries have met the MDG target. More than half the world's populations, almost 4 billion people, now enjoy the highest level of water access: a piped water connection at their homes. But much remains to be done. More than 700 million people still lack ready access to improved sources of drinking water; nearly half are in sub-Saharan Africa. More than one third of the global population – some 2.5 billion people — do not use an improved sanitation facility, and of these 1 billion people still practice open defecation [10].

In Damagum town, the situation is indifferent from that of the larger Nigerian scenario pointed out so far. The problems of water supply in Damagum has been lingering for many years which might also be exacerbated due to the combined effects of drought, low rainfall and desertification for which Yobe state is noted for. Despite efforts of the government and those of the communities in

the provision of potable water supply to the people, adequate potable water supply is still a big problem in Damagum town. Improper sanitation in water supply systems as well as unhygienic water distribution methods also pose considerable threats to the issue of potable water supply in Damagum. Hence, this study was intended to assess the current status and problems of water supply in Damagum town.

IV. SIGNIFICANCE OF THE STUDY

The outcome of this research study is expected to be of enormous importance to governments at all levels by making an objective basis for effective decision making on rural water supply issues as well as other water related agencies, local communities, NGOs, Scholars and students.

V. MATERIALS AND METHODS

The study was conducted to study only the current status and problems of potable water supply in six areas of Damagum town namely; Sabon Layi, Indabo, Bakate, Low Cost Estate, Makara Huta and Ihunka Banza. Descriptive Survey design using both qualitative and quantitative methods was adopted involving 392 local residents selected using Purposive, Accidental and Systematic Random sampling techniques. A closes ended researcher made questionnaire and structured Interview Guide were the instruments used while collected data was analyzed in SPSS Version 20 using descriptive statistics.

Study area

Damagum is the headquarters of Fune Local Government Area in Yobe state, Nigeria occupying an area of 4,948 km² with a population of 300,760 according to 2006 census. It lies within Latitude 11.6774 and Longitude 11.3345 (11° 40' 39" North, 11° 20' 04" East) mainly in the dry sahel savana belt where conditions are hot and dry for most of the year. The hottest months being March, April and May when temperatures range between 30° C – 42° C. Rainy season is usually short and lasts 120 days from June – September and annual rainfall range is normally 500m – 1000m. The area has an altitude of 479m. The historic 8000 year old Dufuna canoe was discovered in this area in 1987 in the village of Dufuna [11].

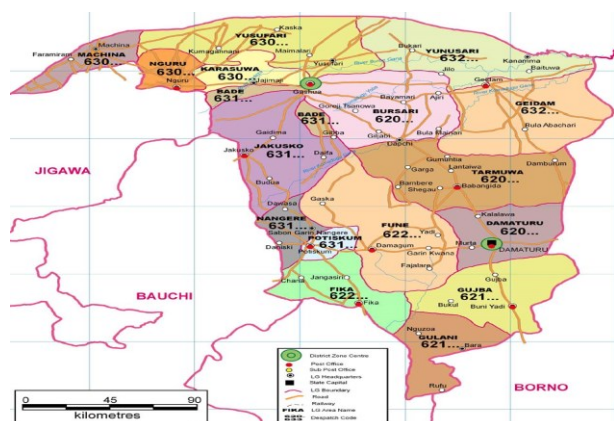


Fig. I. Map of Yobe state showing Fune Local Government Area.

VI. RESULTS INTERPRETATION

Worthy of mention is that, from the total of 392 questionnaires distributed, only 360 were retrieved thus, giving a retrieval rate of 0.92 which was an acceptable one.

TABLE 1: Showing characteristics of the respondents

VARIABLES	FREQUENCY	PERCENT
SEX		
Male	263	73.1
Female	97	26.9
Age		
15 – 24 yrs	28	7.8
25 – 34 yrs	136	37.8
35 - 44 yrs	102	28.3
45 – 54 yrs	42	11.7
55 – 60 yrs	28	7.8
Above 60 yrs	24	6.7
Tribe		
Kanuri	82	22.8
Hausa	79	21.9
Kare Kare	81	22.5
Ngizim	49	13.6
Fulani	69	19.2
Others	0	0
Occupation		
Crop farming	102	28.3
Livestock farming	27	7.5
Civil servant	62	17.2
Trader	61	16.9
Firewood selling	11	3.1
Handy work	97	27.0
Marital status		
Married	233	64.7
Single	103	28.6
Divorced	24	6.7
Level of education		
Arabic	122	33.9
Primary education	92	25.6
Secondary education	13	3.6
Diploma/NCE	87	24.2
HND/Degree	40	11.1
Post graduate	6	1.7
House hold size		
1 – 5	51	14.2
6 – 10	101	28.1
11 – 15	92	25.6
16 – 20	113	31.4
Above 20	3	0.8
Number of years in the area		
1 – 5 yrs	13	3.6
6 – 10 yrs	20	5.6

11 15 yrs	96	26.7
16 20 yrs	113	31.4
21 25 yrs	72	20.0
Above 25 yrs	46	12.8

Demographic characteristics of the respondents as indicated in the Table above showed higher male respondents of 73.1% with only 26.9% females. The Kanuri, Hausa and Kare Kare were found to be the most dominant ethnic groups among the respondents consisting of 22.8%, 21.9% and 22.5% respectively followed by Fulani with 19.2% and Ngizim with 13.6%. Typical of most rural areas in northern Nigeria, the dominant occupation of the respondents happened to be crop farming 28.3%, livestock farming 7.5% and fuel wood selling 3.1%. Other occupations engaged by the respondents were civil servants 17.2%, traders 16.9% and those doing hand works such as carpentry and masonry were 27.0%. Being a predominantly

muslim area where men marry early and cohabitation is prohibited, majority of the respondents were found to be married 64.7% while those yet to marry and the divorced ones were only 28.6% and 6.7%. Probably due to low awareness or lack of enough schools, considerable number of the respondents, 33.9% was found to be lacking the basic western education while 29.2% had only primary and secondary education with 24.2% and 11.1% having obtained the Diploma/NCE and HND/Degree certificates respectively. Besides, only 1.7% of the respondents had post graduate certificates. Expectedly, house hold sizes were also found to be big with 85.1% of the respondents having family members ranging between 6 – 20. Meanwhile, 78.1% of the respondents were permanent residents of the areas having resided there for 11 – 25 years. Only 3.6% claimed to have resided in their areas for less than 6 years while 12.8% stated that they lived in their areas for more than 25 years.

Table 2. Showing estimated population and number of different sources of water supply in the study areas

S/N	AREA	ESTIMATED POPULATION	NUMBER OF COMMERCIAL TUBE WELLS	NUMBER OF GOVT BORE HOLES	NUMBER OF NON GOVT BORE HOLES	NUMBER OF COMMUNAL WELLS
1	Sabon Layi	8000 (39.4%)	4	2	0	1
2	Low Cost Estate	1200 (5.9%)	2	0	1	0
3	Ihunka Banza	1000 (4.9%)	0	0	0	0
4	Makara Huta	800 (3.9%)	0	0	0	0
5	Indabo	5700 (28.1%)	2	1	1	0
6	Bakate	3600 (17.7%)	3	1	1	2
TOTAL		20,300 (100%)	9 (56.3%)	4 (25.0%)	3 (18.8%)	3 (18.8%)

Source: fieldwork (2017)

The above Table shows that in all the six areas studied with a population of 20, 300 people, there were only 19 communal sources of potable water supply from which the local residents get their daily water supply requirements. These sources consisted of 9 commercial Tube wells, 3 communal wells, 4 government provided Bore holes and 3 other Bore holes provided by some Non-Governmental Organisations. Sabon Layi, the most densely populated area with an estimated population of 8000 (39.4%) had 4 commercial Tube wells and 2 government provided Bore holes. However, it was gathered by the study that this area is mostly inhabited by people with relatively high socio economic status so, many of the houses have private Tube wells for their personal uses. The area of Bakate with an estimated population of 3600 (17.7%) had 3 commercial Tube wells, 1 government provided Bore hole and one other Bore hole provided by the Action Contre la Faime popularly known as Action Against Hunger (ACF). Only 2 commercial Tube wells were available at State Low Cost Estate in addition to 1 other Bore hole made available by the Millennium Development Goal (MDG) initiative but

had no any government provided Bore hole. The State Low Cost Estate had an estimated population of 1200 (5.9%) relying on the only 3 communal sources of water supply available in the area. Similarly, Indabo, the second most densely populated area with an estimated population of 5700 (28.1%) had only 1 government provided Bore hole and another one provided by the Chad Basin Development Authority (CBDA). No commercial Tube well was found in the area. May be due to their low population sizes or for being new settlements, the two areas of Ihunka Banza with an estimated population of 1000 (4.9%) and Makara Huta with 800 (3.9%), had no any communal source of water supply. Surprisingly, only 3 communal wells were found in all the six areas studied, however, such wells are typical of many rural areas in northern Nigeria where they make the major source of water supply.

Table 3: Showing responses of local residents on the current status and problems of water supply

To assess the common sources of water supply							
S/N	QUESTIONS	SA	A	D	SD	MEAN	STD
01	Majority of the rural people depend on commercial Tube wells for their daily water supply	108 (30.0)	219 (60.8)	28 (7.8)	5 (1.4)	3.19	.630
02	Government provided bore holes are not sufficient to provide potable water supply for the people	235 (65.3)	125 (34.7)	0	0	3.65	.477
03	Many houses have wells from which they get their daily water requirement	0	0	162 (45.0)	198 (55.0)	1.45	.500
04	Bore holes provided by NGOs, MDGs or other agencies are also available to provide potable water supply	106 (29.4)	64 (17.8)	109 (30.3)	81 (22.5)	2.54	.114
05	Rivers and ponds are also other sources of water supply for the local residents	0	0	198 (55.0)	162 (45.0)	1.55	.498
06	Some houses have private Tube wells from which they get their water supply	196 (54.4)	102 (28.3)	36 (10.0)	26 (7.2)	3.30	.920
To evaluate the level of government participation in the provision of potable water supply							
07	Rural people no longer depend on the government for water supply rather on community initiatives	199 (55.3)	161 (44.7)	0	0	3.55	.500
08	Presently there are few or no government provided source of water supply in the area	156 (43.3)	181 (50.3)	23 (6.4)	0	3.37	.601
09	Majority of the sources of water supply in the area were made available through community initiatives	176 (48.9)	184 (51.1)	0	0	3.49	.500
10	Government participation in the provision of potable water supply is low and generally not appreciated by the people	223 (61.9)	137 (38.1)	0	0	3.62	.486
11	Government does not encourage and support community initiatives in the provision of water supply in the area	183 (50.8)	99 (27.5)	46 (12.8)	32 (8.9)	3.20	.976
To assess the common problems of potable water supply							
12	Generally sources of water supply are so scarce in the area	100 (27.8)	229 (63.6)	31 (8.6)	0	3.19	.573
13	Many local residents suffer from the shortage of potable water supply	231 (64.2)	129 (35.8)	0	0	3.64	.480
14	Women and children trek long distances to fetch water	200 (55.6)	160 (44.4)	0	0	3.56	.498
15	Local people spend significant amount of money in purchasing water	208 (57.8)	118 (32.8)	34 (9.4)	0	3.48	.663
16	As a result of its scarcity, people hardly get enough water supply for their daily requirement	281 (78.1)	79 (21.9)	0	0	3.78	.414
17	Lukewarm attitude of government is the main cause of the problem of acute shortage of potable water supply in the area	171 (47.5)	118 (32.8)	71 (19.7)	0	3.28	.772

KEY: SA (STRONGLY AGREE) A (AGREE) D (DISAGREE) SD (STRONGLY DISAGREE)

Source: fieldwork (2017)

Table 3 above indicates responses of the local residents on the status and problems of potable water supply in the six areas under study. With regards to the common sources of water supply in the areas, there was an overwhelming agreement (90.8%) that majority of the rural people solely depend on commercial Tube wells for their potable water supply (mean value = 3.62, std = .486) in addition to a 100% agreement that government provided were grossly inadequate to provide potable water supply for the rural populace. Besides, majority of the respondents did also agree that there were some Bore holes provided by Non-Governmental Organisations providing water for the people as well as the fact that some houses have private Tube wells for their personal consumption. The local respondents did

also agree that houses in the area do not have Wells (100%) and there were no rivers and ponds from which the local people can get water supply (52.8%).

Meanwhile, almost all of the local residents (100%, mean value = , std =) agreed that the role played by government as well as its participation in the provision of potable water supply for the rural people was nothing to write home about so, not commendable. They overwhelmingly agreed that people in the areas no longer depend on the government for their daily water supply requirements but heavily rely on commercial Tube wells and to some extent on the few Bore holes provided by some NGOs such as the MDG.

With regards to common problems of potable water supply in the areas under study, responses of the local

populace outlined the existence of numerous problems. Majority of them agreed that there was acute shortage of communal sources of water supply as a result of which the people suffer from serious shortage of their daily water requirement, women and children trek long distances to fetch water and that the local residents spend significant amount of money in purchasing water. The local populace did also agree and attributed these prevailing problems to government's lukewarm attitude towards the provision of potable water supply for the rural people.

VII. DISCUSSIONS

Common Sources of Potable Water Supply

In any nation, the provision of potable water supply by government to its citizens is a right and not a privilege. The responsibility of water supply in Nigeria is shared between the three levels of government – federal, state and the local governments. The federal government is in charge of water resource management; state governments have the primary responsibility for urban water supply; and local governments are responsible for rural water supply. However, the people of Damagum in Yobe state Nigeria had lost the right for potable water supply by the government as a result of which they solely depend on community provided commercial Tube wells for their water requirements. With only 16 sources of potable water supplying a population of 20,300 people, the issue of acute shortage of water supply is inevitable meaning the people are living without access to adequate improved drinking water source. It is worthy of note that, water from Tube well is not always pure so not completely safe for human consumption. Tube wells are commonly contaminated with faecal organisms [4]. Besides, [4] reported that, water analysis of some tube wells in Matlab, Bangladesh showed contamination with zooplanktons and Bacteria. In addition, the practice of harnessing rain water for household use that is common in the southern part of Nigeria cannot be actually practiced here as a result of low annual rain fall recorded.

According to the [10], although the world met the MDG drinking water target, 748 million people – mostly the poor and marginalized – still lack access to an improved drinking water source. Of these, almost a quarter (173 million) relies on untreated surface water, and over 90% live in rural areas. Two out of five people without access to an improved drinking water source live in Africa. The world met the MDG target for drinking water in 2010, but 45 countries are still not on track to meet the target by 2015 [10]. Many factors including high population growth further exacerbate the challenges of meeting the MDG target of 75% coverage for safe drinking water and 63% coverage for basic sanitation by the year 2015. Surprisingly, traditional wells typical of many rural communities in Nigeria were not available in all the areas studied although it was reported that such wells were used some years back. This can be attributed to the effects of climate change, shallow water aquifers as well as the proliferation of Tube wells in the area. In the southern part of the country, rainfall is high, surface water and springs are often the most appropriate source of water while in the north, rainfall is low and

aquifers are shallow. In a study to investigate the potable water supply in Akinima community in Rivers state [5] found out that the community like many other rural communities in Nigeria has no pipe-borne water supply but rely basically on harvested rain water, water from bore holes and rivers all of which are identified to have varied problems of contamination and pollution.

Government Participation in the Provision of Potable Water Supply

The outcome of this study indicates gross inadequacy of government participation in the provision of potable water supply in the study area with only 4 government provided bore holes supplying drinking water to a population of about 20,300. Despite the existence of the Rural Water Supply and Sanitation Agency (RUWASA) in Yobe state, no any source of water supply was provided by the agency in the study area in spite of the perennial problem of water supply that bedeviled Damagum town for many years. In such situations, the proclamation of the World Health Organisation that the minimum water supply requirement per individual of 120 liters daily is just a mirage to the people of Damagum town. Although various policies have been put in place both at the federal and state levels aimed at enhancing the status of potable water supply in the country, numerous challenges still prevail possibly due to poor implementation of those policies. At the federal level, substantial progress has been made to define institutional roles and develop supporting policies for water supply and sanitation service delivery. The key challenge for Nigeria is to promulgate this policy guidance at the state level as water supply and sanitation is mostly the state governments' responsibility. Water and Sanitation coverage rates in Nigeria are amongst the lowest in the world. According to the Water and Sanitation Monitoring Platform (WSMP), available data and coverage estimates show that improved drinking water and sanitation coverage rates are low in Nigeria with the North East region having the lowest coverage rates: less than one-third of the population has access to improved water sources. The rural areas recorded a decrease of 4% from the 34% in 1990 to 30% in 2006 [12]. Although provision of water and other social services is the responsibility of Federal, State and Local Government Areas (LGAs), government at all levels have very limited budgets and human resources capacity for the implementation of sector activities.

Nigeria is the most populous country in Africa with an estimated population of 132 million, growing annually at a rate of 2 percent. However, the rapid population growth has not been accompanied by an increase in the delivery of water supply, sewage and sanitation services. The gap between those areas that have reasonably safe access to water supply and sanitation and those without is growing wider. Urban areas experience greater coverage, whereas peri-urban, semi-urban, and rural areas are experiencing stagnation or a decline in service.

Common Problems of Potable Water Supply

Considering the number of sources of potable water supply available in the area studied, problems associated with water supply are inevitable. This was further confirmed by responses of the local people compiled by the

study. In this line, majority of the respondents agreed that the numerous challenges of potable water supply in the area manifest in the form of scarcity of sources of water supply, acute shortage of drinking water, women and children trekking long distances to fetch water, increasing poor sanitary conditions as well as huge expenses in the purchase of water. According to the respondents, an average family of about 5 members spends not less than 200 Naira daily in buying water that does not suffice the family requirements. According to the local people, hardly can a member of a family utilise one jerry can of water (20 ltr) in a day as a result of which some local residents stay for days without taking bath and washing of clothes are usually done on weekly basis. According to [6], in some parts of Kano city, on a daily basis, a family of between 5-8 children without a secure source of water spends between 100 – 200 Naira to purchase 30 liters of water which falls short of the minimum requirement for a healthy living. To save costs, women in addition to various management techniques identified earlier also minimise use of water by reducing the number of times children and other members of the family wash clothes and take bath once in two days or in a week, the use of minimal water for washing vegetables and food items. The health implications of this cannot be overemphasized, as a result of which cholera and diarrhea is a common illness in places ravaged by acute water shortage. Definitely, in any society facing acute water shortage, sanitary conditions must also be very bad. These findings further confirm those of many other authors in the field. In a report by the United Nations Children Emergency Fund (UNICEF), it was reported that a journey to fetch water in many parts of Nigeria can be a round trip of up to 10km and lasting up to 4 – 6 hours particularly in the dry season [9]. Besides, the productivity of those heavily involved in fetching water especially women and children are seriously affected with adverse impacts on health care, school enrolment, school attendance, women participation in community development etc.

Moreover, data on the demographic characteristics of the local residents suggests that majority of them are of very low socio economic status thus, spending much money on purchasing drinking water from water vendors commonly known as “Maimoya” will definitely have serious economic consequences on them. Coupled with the fact that many of the local people lack the basic western education, knowledge on basic water purification practices to avoid water borne diseases will also be lacking. According to Water Supply and Sanitation Interim Strategy Note, many households in Nigeria, often the poorest, end up purchasing water from private vendors much more expensively than from the public supply. Water supply services, where they exist, are unreliable and of low quality and are not sustainable because of difficulties in management, operation and pricing and failure to recover costs. Many water supply systems show extensive deterioration and poor utilization of existing capacities, due to under-maintenance and lack of funds for operation. According to the USAID, planning access to improved water and sanitation is a daily challenge for most Nigerians. The problem is particularly acute in the rural northern Nigeria, where only about 30%

of the population has access to safe drinking water and adequate sanitation. This situation leads to a high prevalence of water borne diseases, threatens the livelihoods of smallholder farmers, and contributes to low levels of school enrolment, especially among girls [1].

Furthermore, in a Face to Face interview with some Ward Heads of the studied areas locally called the “Bulama”, the perennial problem of acute shortage of drinking water in Damagum has led to migrations of some local residents to other areas where there is a relatively low water supply problem. This trend can lead to over population in these areas with resultant poor environmental conditions especially due to the fact that most of these migrating communities are generally poor and uneducated.

VIII. CONCLUSION

Based on the findings made by this research study, it can be concluded that, with the caliber of people living in the areas studied most of whom were poor, married, having large family sizes and lack the basic western education, the absence of adequate sources of potable water supply with resultant acute shortage of drinking water will certainly have serious social, economic, educational, spiritual and political consequences. Socio economically, people’s productivity can be affected where by much time is spent on getting water instead of indulging in other productive activities as well as decrease in income as a result of huge expenses in purchasing water. Educationally, school enrolment as well as school attendance will be very low as a result of most children dedicating much of their time in fetching water as well as battling health challenges caused by waterborne diseases that are usually prevalent in places with poor sanitary conditions resulting from inadequate water supply. Similarly, spiritual and political consequences are also inevitable. Being a Muslim dominated society, religious practices which most of the times require the use of water can be seriously hampered. Most importantly, adverse impacts of shortage of water supply on health care may be most challenging. In such situations, the prevalence of water borne diseases such as cholera, diarrhea, typhoid fever and so on is usually high leading to deaths, loss of productivity as well financial losses. Socially, migration of some families to other places with low water supply problems can lead to over population in those areas turning into slums that are usually associated with poor sanitary conditions with high crime rate. Cumulatively, all these challenges that may ensue as a result of acute shortage of water supply can lead to serious political repercussions especially when the affected people lose confidence in the government.

IX. RECOMMENDATIONS

Based on the findings made by this study, the following recommendations are proffered that can serve as basis of overcoming the problems associated with potable water supply in the area studied.

- Governments and other stakeholders should encourage the development of a well designed project for integrated water supply in the area.
- Governments at all levels should reconsider the heavy reliance on electricity to power water supply machineries instead, the abundant solar energy endowed by nature in the area can be harnessed and used to power solar bore holes. With this development, more solar powered bore holes can be constructed in every remote rural area and with less cost.
- More other sources of water supply such as protected wells should be made available.
- Awareness raising campaigns among rural dwellers on the dangers of using unsafe water as well as simple water purification practices should be embarked upon with the aim of reducing the rate of water borne diseases in the areas.
- Rural people need to be more informed on proper water management techniques and maintenance culture.
- The proliferation of commercial Tube wells in the area on which the people solely rely should be well regulated and monitored by the government especially that water from such sources is usually not considered to be very pure.

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