

Assessment of Environmental and health problems caused by Kiri dam in Kiri area, Shelleng Local Government Area of Adamawa State

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Submitted: 02-02-2021

Revised: 18-02-2021

Accepted: 22-02-2021

ABSTRACT: This research work was on the assessment of the major environmental and health problems caused by the Kiri dam in Kiri area. It was discovered that creation of large reservoirs inevitably brings a lot of changes such as agricultural innovation in form of irrigation, improved fishing, infrastructure facilities, electricity and pipe borne water. Data used were both primary and secondary data through the use of instrument such as GIS and remote sensing packages so as to produce new map that shows the present extent of Kiri Dam. Three (3) villages were sampled around the Kiri dam, which were Kiri, Shelleng and Banjiram. Systematic and random sampling techniques were used. Questionnaire administration, oral interview, personal observations were used as methods of data collection. In order to come up with standard result, descriptive statistical analysis tools such as the mean, percentage, frequency, charts and tables were used. All the analyses were done using SPSS version 23 packages. Geographic information systems such as Google earth, camera, and software packages were used to analyze present extent of the dam. It was discovered that the major environmental problems discovered were flooding, soil erosion, and destruction of farmlands and contamination of portable water. Related health problems discovered include malaria, typhoid, cholera, skin disease and dysentery. It was recommended that; Awareness should be done on the implication of environmental and health problems around the Kiri dam, Healthcare facilities such as clinics, drugs and first aid boxes should be provided to the teeming population of Kiri dam so as to alleviate the issue of health problems.

Key words: environmental problems, health problem, Geographic Information System

I. INTRODUCTION

Dams are large socio-economic investments built to fulfill single or multiple purposes as domestic and industrial water supply, energy production, irrigation, flood control and erosion as well as enhance recreation and tourism (Adams 2002). The construction of dam and a reservoir is considered as the most effective means of solving human problems of water storage in sub-humid and arid region as Bohlen & Lewis, (2008) asserted in the savanna area.

Dam project or construction of dams dates to many centuries ago, Starting in the Nile and Tigris in the present day Egypt and Iraq respectively. In Nigeria most of our dams are multipurpose dams, such as Kainji dam which was built in 1968, Tiga dam in Kano, Bakalori dam in Zamfara, Goronyo in Sokoto, and Zobe Dam in Katsina, Kiri dam in Adamawa state etc (Norman 1976).

The construction of dams is considered as one of the most effective means of solving human problems of water shortage in sub-humid and arid areas. Olofin (1982) assert that in Nigeria, dams' construction is seen as the only solution to the problem of water scarcity in savannah areas. Ologe (1973), state that dams bring social and economic changes to the regions where they are found. Also Warren and Robbin (1968), show that the creation of large reservoirs inevitably brings a host of changes such as agricultural innovation in form of irrigation, improved fishing, infrastructure facilities, electricity and pipe borne water. It also brings about some negative socio-economic effects like inundation of farms by water, reduction in fishing activities downstream of the dam, increased in health hazard especially those associated with resettlement or displacement and relocation of the affected population. However, despite these problems, Kiri dam like other dams constructed both within and outside Nigeria have contributed to

the improvement of living condition of people living around the dam. Therefore objective such as the major environmental and health problems caused by Kiri dam in the area was assessed.

THE STUDY AREA

Kiri Dam is situated in Shelleng Local Government Area of Adamawa State. Shelleng is located along latitude $9^{\circ} 53' 51''$ N and longitude $12^{\circ} 0' 32''$ E of the Greenwich meridian. It shares borders with Borno State to the north, Song L.G.A to the East, Demsa L.G.A to the south and Guyuk L.G.A to the West. The dam was constructed in 1982 for the purpose of irrigation, hydroelectric power generation and water supply to Savannah Sugar Company, Numan. The major water supply to the dam is from Gongola River, and it is a tributary to river Benue. The present extent of Kiri dam is 72.20km^2 as shown on figure 1. The population around the Kiri dam consists of cluster of compound, each surrounded by local made mats

and mud wall. The compounds are situated 50-100 meters away from the Dam. The inhabitants come in contact with the dam on daily basis for different purposes including fishing; bathing, washing and collecting water for domestic use Adebayo (1999).

The rainfall regime in the area is a tropical continental type of single peak toll usually in the month of August or September. The wet season ranges from April to October, with annual rainfall value of between 510 – 1040mm and dry season last for about 7 months. Kiri area of Gongola valley has warm temperature with a mean annual minimum of 18°C in December and a mean annual maximum of 38°C in March. The evapotranspiration is very high throughout the year. Relative humidity varies greatly throughout the year. It is high from May to October, which ranges from 60 – 70% but has lowest values during dry season that ranges from 27 – 35% (UBRBDA 2016).

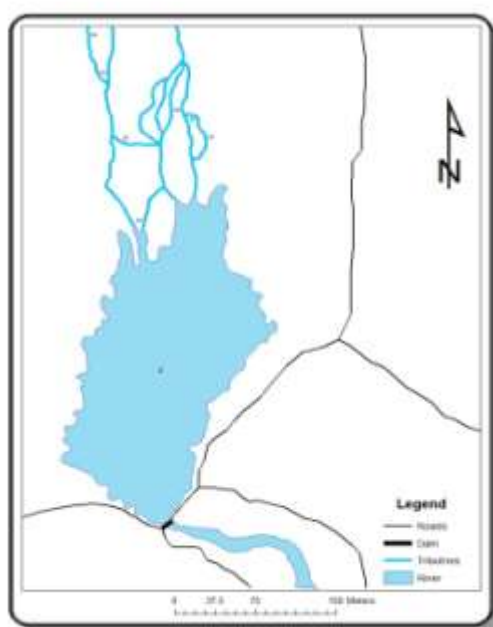


Figure 1: study area (Source: fieldwork 2019).

The area is generally a lowland area, between 500 – 700 meters above the sea level. The land forms of the area are characterized by extensive floodplains and alluvial swamps; it has a sedimentary rock which made up of shale and their bands of limestone and lignite. It contains wide range of alluvial deposit along wide channels of river Benue and Gongola which overlies the cretaceous deposit (Zemba, Adebayo and Ba 2016).

Kiri is pluralistic in either composition, the main ethnic group found is Kanakuru, and there

are also other tribes, like the Lunguda, Bachama, Hausa, Bura, Jukun and Jenjo. The dominant religions found include Christianity and Islam, the people are also well known for their diverse historical and cultural heritage (Adebayo 1999).

II. METHODOLOGY

The source of data involved both primary and secondary data, which served as a guide to achieve the objectives of this research work. The equipment/instrument used in this study were

Google earth, GIS and remote sensing packages so as to capture and produce new map that shows the present extent of KiriDam. Other software such as Microsoft office, CorelDraw and SPSS were used for subsequent analysis and manipulations. In order to select respondents' for questionnaire administration, a sample of three (3) villages were selected they include Kiri, Shelleng, and Banjiram which were the immediate villages around the dam out of many to form a representative sample, and served with the questionnaire. The questionnaires were distributed based on the population of each settlement. Stratified sampling technique was adopted to divide Kiri environs into unit's base on population, after which Systematic sampling technique was adopted to strictly invade the sections one after the other, finally random sampling technique was used to draw respondents that answered questionnaire from each units.

Houses in each selected unit were given numbers such that randomly five houses were selected through folding the papers that contain house numbers so as to choose houses to administer questionnaire on. From the houses selected, respondents were selected randomly due to the nature of how people responded to approach. Questionnaires were distributed to the respondents

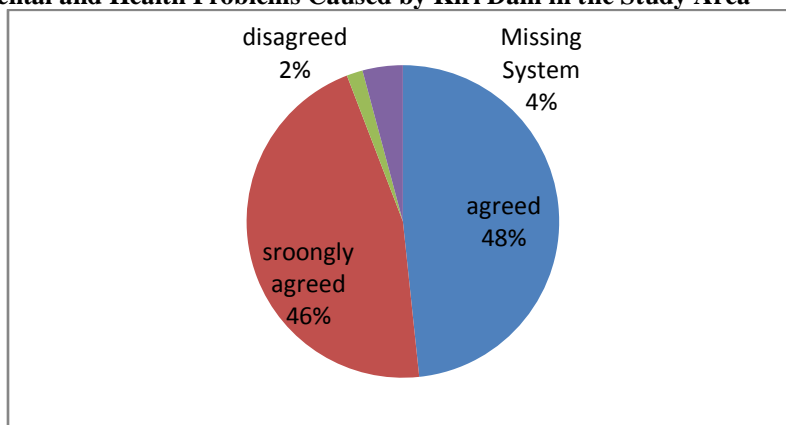
in an orderly manner to generate accurate information for the study.

The questionnaire concerned the environmental and health issue caused by Kiri Dam on the settlements. One hundred and fifty (120) copies of questionnaires which contain four typed questions each were produced and distributed to the respondents in all selected settlement. Areas of high population density attracted more questionnaires while those of low population density attracted few questionnaires in order to generate data stated in the types of data sources. Prominent people such as elders, village head of the settlement, the illiterate were interviewed orally so as to get adequate information on project at hand, data related to the research were collected using remote sensors such as camera and GPS.

In order to achieve the aim and objectives of this research work, the data collected were subjected to descriptive statistical analysis such as, percentage, frequency, and tables. Pie chart and bar chart were used to clearly show the description and interpretation of the data collected. All the analysis were done using SPSS version 23 package, excel, Geographic information systems such as Google earth, camera, and software packages to analyze present extent of the study area.

III. RESULTS AND DISCUSSIONS

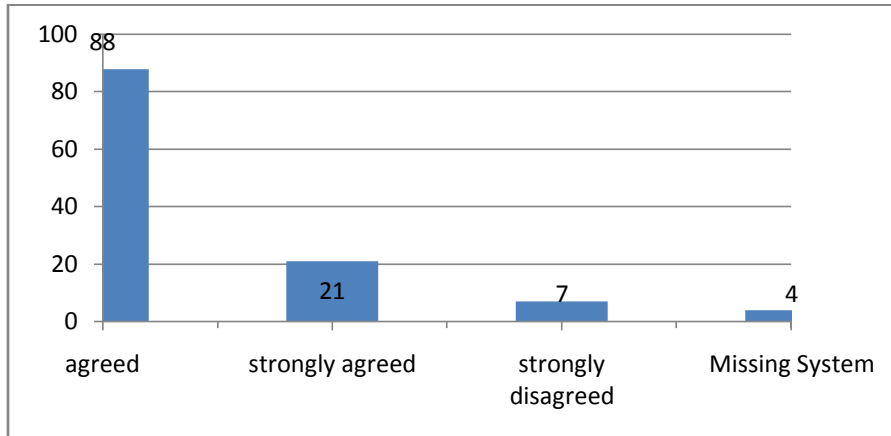
Major Environmental and Health Problems Caused by Kiri Dam in the Study Area



Source: fieldwork 2019. Figure 2: there are environmental problem in Kiri dam

According to figure 22, 48% of the respondents agreed that there are environmental problem facing Kiri dam, 46% strongly agreed that Kiri dam have a lot of environmental problems, 4%

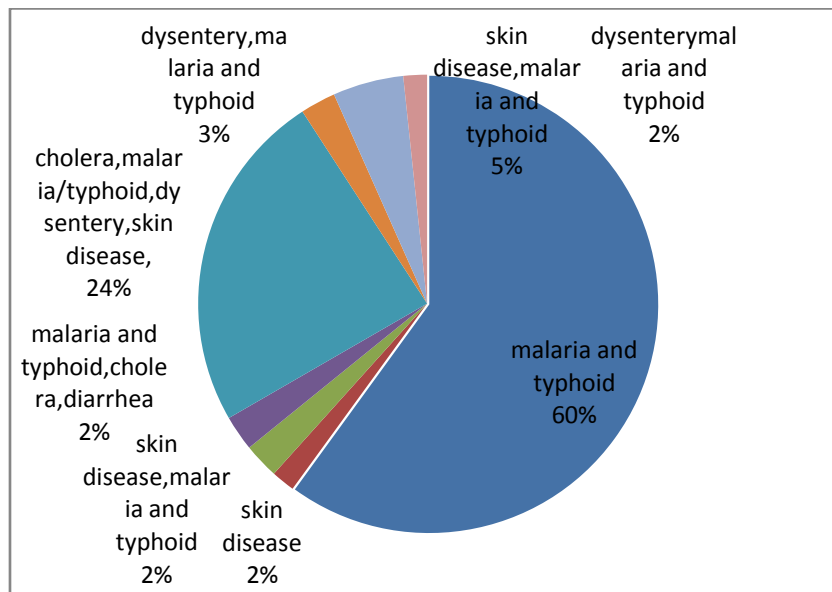
could not account the matter while 2% disagreed the issue. It can be deduced that Kiri dam has lot of environmental problem.



Source: fieldwork 2019. Figure 3: there are health problem in kiri dam

According to figure 23, 88(73.3%) of the respondents agreed that there are health problem facing kiri dam, 21(17.5%) strongly agreed that kiri dam have a lot of health problems, 4(5.8%) could

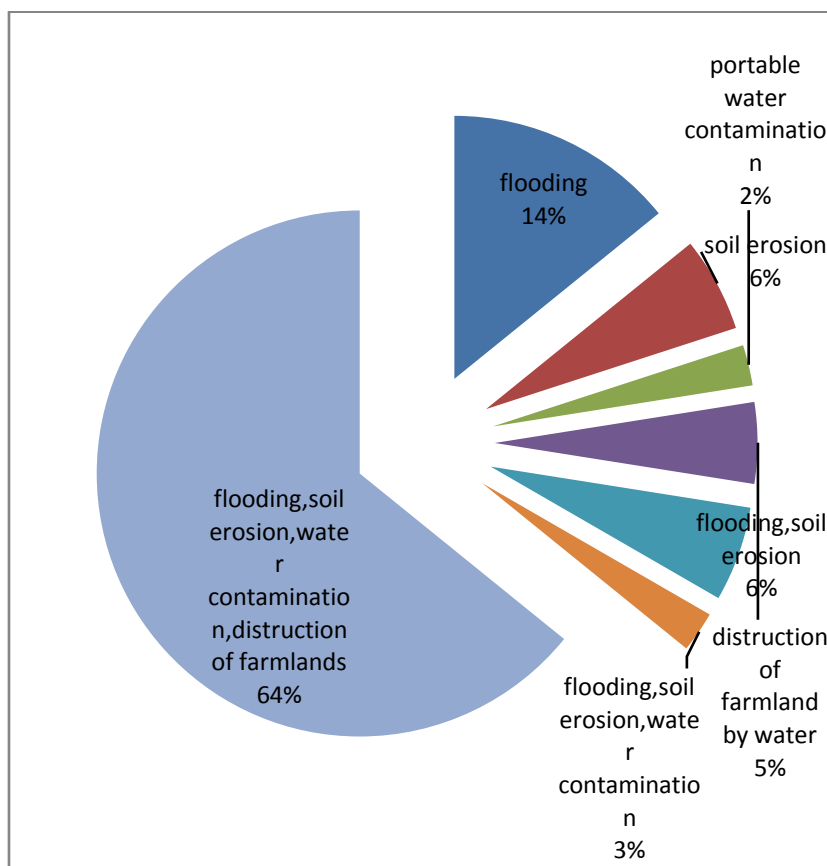
not account the matter while 2(3.3%) disagreed the issue. It can be deduced that kiri dam has lot of health problem.



Source: fieldwork 2019. Figure 4: Health problem

The data collected from the responded as shown on figure 24, malaria and typhoid are the dominant health issues in Kiri dam, figure 24 indicates that cholera, dysentery, and skin disease

also dominate Kiri environment. It also shows that healthcare facilities are inadequate in the environment.



Source: fieldwork 2019. Figure 5: Environmental problem

From figure 25, the major environmental problem as indicated is flooding, because it occupied 14% alone, second by soil erosion as postulated by the result, thirdly is the destruction of farm lands. 64% of the respondents indicate that flooding, soil erosion, water contamination and destruction of farmland dominate the Kiri dam environment. This result indicates that flooding, soil erosion, water contamination and destruction of farmland really affect the activities of people in Kiri environment.

IV. CONCLUSION

The result of the findings indicated that Environmental and health problems are common in the study area, amongst are flooding, soil erosion, destruction of farmlands, destruction of buildings, dysentery, malaria and typhoid, skin disease and cholera. Therefore, it was recommended that; Awareness should be done on the implication of environmental and health problems around the Kiri dam, Healthcare facilities such as clinics, drugs and first aid boxes should be provided to the teeming population of Kiri dam so as to alleviate the issue of health problems. People should be advised not to build, farm and trade along the dam environs so as

to reduce the issue of flooding, farmland destruction, portable water contamination and destruction of buildings. People should be advised to stop drinking stream water so as to minimize the case of malaria, typhoid, cholera, and dysentery and skin disease.

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**International Journal of Advances in
Engineering and Management**

ISSN: 2395-5252



IJAEM

Volume: 03

Issue: 02

DOI: 10.35629/5252

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