

Completion of Sabke Dam Water Supply and Irrigation Project as a Boost to Water Resource Management in Katsina State, Nigeria

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ABSTRACT: The Sabke dam project created in 1999 was meant to harness and manage water resources of the area to supply water for domestic use and irrigation purposes in four local government areas in northern arid parts of Katsina State. However, years after the creation of the project the pumping station has not been completed and irrigation farming has not commenced on the dam sites. The Federal Government under President Buhari took over and completed the project and it was commissioned on May 28th 2018. The objectives of the study are to examine the situation before and after the dam construction and to explain the observations and complain of the benefiting communities despite the completion of the dam project. Data for the study were generated through direct observational techniques during three field visits to the dam site, water pumping station and irrigation fields including the administration of a structured questionnaire among the residents of nine villages across four local government areas in northern part of Katsina State. The results have shown that there are still limited areas that are supplied with water which is mainly Daura Township. Irrigation farmers on both the upstream and downstream could not be supplied with adequate water to boost dry season farming. It is therefore concluded that there should be comprehensive assessment and evaluation of the completion of the project by the State and Federal Governments.

Keywords: Dam, water supply, irrigation project, water resources management, Katsina State

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INTRODUCTION

A dam is a structure built across a stream, river or estuary to retain water for single purpose or multipurpose (Saleh et al., 2010). Single purpose dams are those constructed for a single purpose such as domestic water supply or hydroelectric power generation, while multipurpose are those constructed for multiple purposes such as water supply for domestic use, irrigation purposes, livestock watering and fish production, flood control electricity generation and tourism (Saleh et al., 2010).

Cunningham and Cunningham (2004) observed that half of the world's 227 largest rivers have been used for the construction of dams for the purposes listed above. By the year 2000, the world had built more than 45,000 large dams to irrigate crops, generate power, and control floods during the rainy season and store water during the dry season (World Commission on Dams, 2000). The more than 45,000 large dams built around the world have been playing important roles in assisting communities

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and economies in harnessing and managing their water resources for several uses (WCD, 2000). The creation of small, medium and large scale dams is perceived by many scholars as a means of managing the water resources of a state, region or country (Mutawalli, 2020). Water resource management is the process of planning, developing and managing water resources in terms of both water qualities, across all water uses. It includes institutions, infrastructure, incentives and information system that support and guide water management (World Bank, 2019).

As a natural resource and component of the biosphere, water is a decisive life providing, supporting and environment conserving factor on the planet earth (Duzen and Ozler, 2013). Chawre (2015) further observed that water is the most essential natural resource of life, only next to air and is likely to become a critical resource in many regions of the world coming decades. These indeed calls for the management of water especially in view of the fact that there are many users of the earth's fresh water which is limited in supply compared to the saline water.

Water resource management is a very important issue from several angles which include development of water bodies for future use, protection of available existing water bodies from pollution and over exploitation and to prevent disputes among users (Sukla, 2014). Water resource management at present has become a daunting task in view of some challenges such as climate change, urbanization, rapid population growth and effects of human activities that pollutes water bodies (Aqua Tech, 2022). Ladan (2014) observed that it has become very imperative to manage water resources in developing countries due to high rate of population growth and large percentage of the population that depend on agriculture as a source of livelihood.

One of the gigantic water resource development projects through dam construction being executed by one of the developing countries in Africa is the Grand Ethiopian Renaissance dam that is under construction since 2011. The dam is meant to relieve Ethiopia's acute energy shortage and for electricity export to neighboring countries. The dam, with a planned installed capacity of 5.15 gigawatts will be the largest electric power plant in Africa when it is completed (The Economist, 2020). The construction of the grand Ethiopian Renaissance Dam has shown the relevance of the dam as a boost to electricity generation, flood control among others.

Several studies have been conducted on dams in Katsina State, northern Nigeria. Sonuga and Oloke (1999) studied regional development – the Sabke approach. The results of the study showed that the project was envisaged to alleviate the hardships of the people in the Sabke area in northern Nigeria through the provision of portable water, irrigation and rural infrastructure. Saleh et al. (2010) studied the economic

impacts of dam construction, a case study of Tura dam in Kankara, Katsina state. The results showed that the construction of the Tura dam has brought gains in the form of farmer's income, more land under cultivation and expansion in fish production. Ladan (2014), studied dam collapse and its implications on agricultural production in Kankia, northern Nigeria. The results showed that the dam collapse has led to loss of water resources which have implications such as destruction of farmlands, loss of dry season farming opportunities, loss of water and pasture for livestock, movement of cattle away and migration of some farmers to another dam site.

Based on the literature review it can be observed that Sonuga and Oloke (1999) had identified the Sabke dam project as a regional development project in semi-arid parts of Katsina state, northern Nigeria when the dam was under construction in 1999 and later abandoned. The Sabke dam project was constructed by the Federal Government of Nigeria under the defunct Petroleum (Special) Trust Fund (PTF) to supply water for domestic and irrigation purposes in four local government areas (LGAs) namely Daura, Dutsi, Maiadua and Mashi in northern arid parts of Katsina state. However, following the dissolution of the PTF in 1999 by the civilian administration of President Olusegun Obasanjo, the project became abandoned and therefore uncompleted. The government of President Buhari (2015-2023) took over and completed the project which was commissioned on May 28th 2018.

The aim of this paper is to examine the completion of the Sabke water supply and irrigation project as a boost to water resource management in the arid parts of Katsina state. The objectives of the study are to examine the situation before and after the dam construction, to explain the observations and complain of the host communities despite the completion of the dam project and to highlight the recent efforts by the Federal House of Representatives to revitalize the project. The study will contribute to the body of knowledge by finding out the present state of the project and the challenges facing it which have made irrigation farming to be practiced only in few locations despite the completion of the project. It is also envisaged that the findings of the study will make decision makers in the water sector to re-visit the project as proposed by the Federal House of Representatives in November 2023.

Study area

The study area is Sabke dam which is located at latitude 12° 57' 30" – 13° 5' North and longitude 8° 11' 00" – 8° 14' 00" East at 451 meters above sea level and 35km north west of Daura, Katsina State (Bala and Abdullahi, 2011). The dam was impounded with the damming of two major seasonal rivers namely Bulbula at the eastern bank and

Babbar Ruga at the western bank in Mai'adua and Mashi Local Government Areas (LGAs) respectively (Bala and Abdullahi, 2011). The two rivers are supported by minor streams in both the two LGAs including spill over from nearby Daberam dam located in Daura and Dutsi LGAs. The dam has an active storage capacity of 31.60 million cubic meters of water and a flood storage capacity of 56 million cubic meters (Explane Limited, 1997). The dam land utilization under irrigation was proposed at 1,000 hectares with surface lift as the type of irrigation system (Zango and Rafindadi, 2015). The crops grown are mainly vegetables with fishing activities and domestic purposes being other uses of the dam.

The Sabke dam is mainly in Mai'adua LGA though small sections of the dam are found in Mashi and Daura LGA. Mai'adua as a local government is located at approximately latitude $12^{\circ} 57' 30'' - 13^{\circ} 14' 00''$ North and longitude $8^{\circ} 5' 00'' - 8^{\circ} 28' 0''$ East (see Fig. 1). The LGA has a total land area of 528kms and a population of 201,178 persons based on the 2006 National Population Census (Bawa, 2013).

Mai'adua LGA shares boundary to the east with Mashi LGA, to the south by Daura LGA, to the south east by Zango LGA and to the north by Niger Republic. The inhabitants of the LGA are mainly farmers, cattle rearers and traders at the Mai'adua weekly market that operates on Sundays. The Mai'adua weekly market due to its location (less than 10kms away from the Niger Republic border) is an international border market serving as center for exchange of goods such as grains and cattle between Nigeria and Niger Republic. The inhabitants by tribe are mainly Hausa and Fulani who live in villages, hamlets and isolated settlements within the LGA. In terms of physical setting, the relief is part of the High plains of Hausa land with no hills and rock formation on the open landscape. The drainage is part of the river networks flowing out of the country to Niger Republic after rising from Dambatta LGA in Kano state (Usman et al., 2018). One of the dams besides Sabke dam is Koza dam located in eastern part of the LGA. The climate is tropical continental type with marked short wet season for about 4 months and long dry season for about 8 months. Temperature fluctuates between 18.5°C maximum in the cool season in December and 39.5°C maximum in the hot season in April of every year (Aruwayo et al., 2021). Mean annual rainfall ranges from 762mm – 625mm which indicates the arid nature of the LGA and the relevance of water bodies for human and animal consumption (Babsal and Co., 1998). The vegetation consists of mainly short scattered trees, grasslands and shrubs which dominate the landscape. A number of afforestation programs exist in the LGA with the view to improving the vegetation cover thereby halting desertification as Mai'adua is one of the desert prone frontline LGAs of Katsina State (Halliru, 2019). The map of the study area can be seen on (Figure 1).

MATERIALS AND METHODS

Materials used in the study is the topographical map of Mai'adua LGA showing the Sabke dam and other settlements used for the administration of the research questionnaires. The map was sourced from Ministry of Lands and Surveys Katsina, Katsina State and drawn at the Cartography Unit of Umaru Musa Yaradua University Katsina. Another material used in the study is WX3 Techno phone camera used to snap the Sabke dam site, the collapsed irrigation canals, and the youth organization placard. These three figures were used to show issues discussed in the study for better understanding.

The methods of data collection include direct observation technique used to observe using a check list, the dam and its structures, the irrigation fields and facilities, water treatment station, water supply facilities and structures. The observations were made during three field visits to the dam site and village sampled for the questionnaire administration. The field visits were conducted on July 4th 2021, September 24th 2022 and October 4th 2023. During the last two visits a total of eighty eight (88) questionnaires were administered on the residents of nine (9) village settlements in the four LGAs. The settlements are Dogon Hawa, Nasarawa, Tsbu and Yadi in Mai'adua LGA. Wazobia and Yardaddo villages in Mashi LGA, Karawa and Shargalle in Dutsi and Darugawa in Daura LGA.

The sampling technique used to select those that responded to the questionnaires is purposive sampling to select a sample size of 88 persons from the nine villages. The persons are those whose occupations are directly related to the dam such as farmers, fishermen, cattle herders, water vendors and butchers. The sampling technique is adopted based on the realization that these are the sub-set of the population that are willing to respond to the questionnaire and aware of the project. The questionnaire administered is divided into two sections A and B. Section A is meant to collect data on the demographic characteristics of the respondents. Section B consists of the main questions pertaining to the dam project.

These include the background to the construction of the dam, the situation before and after the construction, the dam boosting to water supply, observations and complains on the project despite completion and suggestions to improve the situation.

The data collected through the direct observation and questionnaire administration were complemented with secondary sources of data collected from desk research from textbooks, journals articles, conference papers, project review documents, environmental reports and internet sourced materials. The data collected through all the sources were analyzed using descriptive statistics in terms of percentages, means and tabulations.

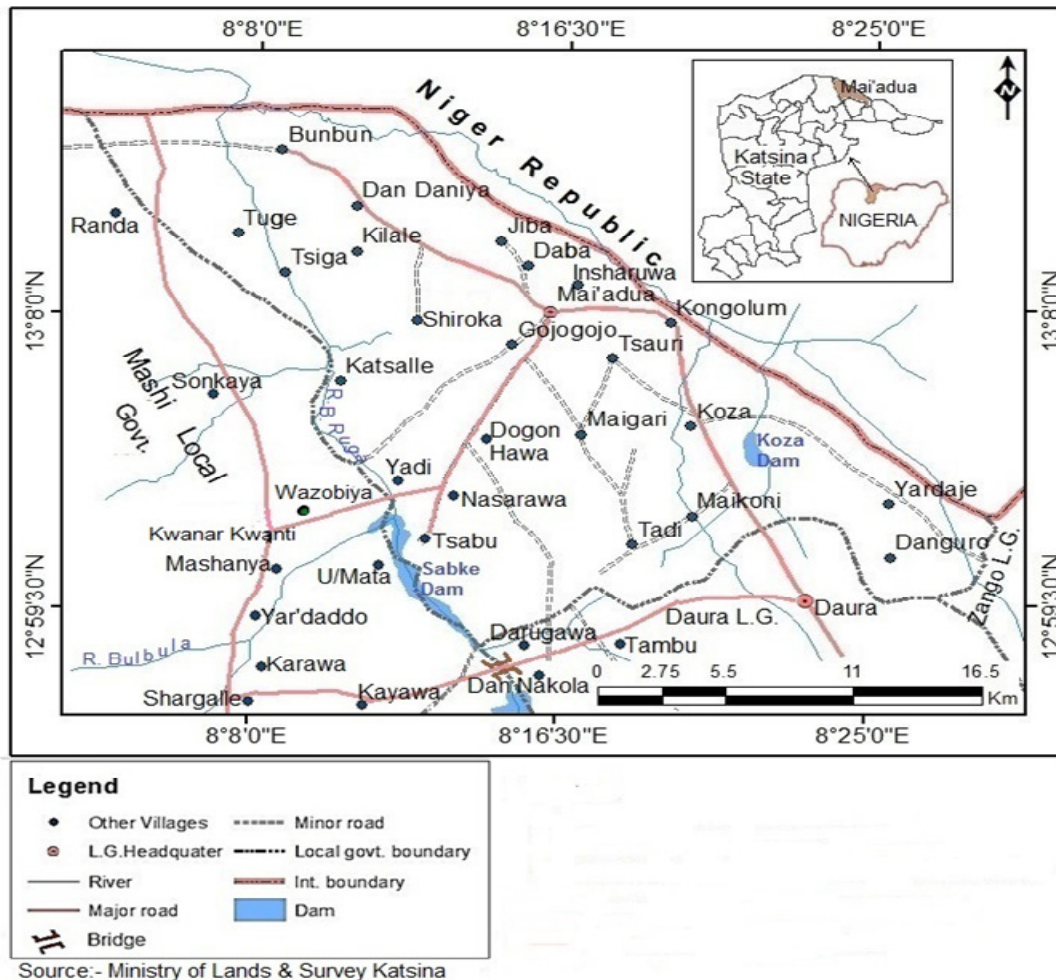


Figure 1: The Study Area showing Sabke dam.

RESULTS AND DISCUSSION

Demographic characteristics of the respondents

The demographic characteristics of the respondents showed that majority (90.00%) of the respondents are males while minority (10.00%) is females (Table 1). This is because the males are found outdoors and ready to respond to questions on the dam project as they have more knowledge on it. In terms of age range, majority of the respondents (40.90%) are found within the age range of 40 – 49 years of age. This age range is quite aware of the dam project when it was started and then abandoned. The marital status of the respondents indicates that all (100%) the respondents are married and fully responsible persons who are concerned about the dam project. Majority of the respondents (50.00%) are married to two wives with majority among them (45.50%) have given

birth to 5 – 9 children (Table 1). The educational qualifications of the respondents showed that majority of the respondents (40.90%) have no western education but Qur'anic education. This is quite typical with rural areas in Katsina state and indeed northern Nigeria. The type of occupations among the respondents showed that majority (31.81%) are engaged in rainy season farming with those engaging in irrigation farming constituting 18.18%. This occurs as there is a decline in the number of people engaging in irrigation farming due to the challenges associated with the project despite its completion.

The Sabke Dam Project

'Sabke' is the name of the village where the dam was originally scheduled to be constructed in Dutsi LGA (Figure 2). But the location of the dam was moved to Tsabu in Mai'adua LGA while retaining the name (Figure 2).

Table 1: Demographic characteristics of the respondents

Characteristic	Frequency	Percentage (%)
Gender		
Male	80	90.00
Female	08	10.00
Age Range		
20-29	16	18.18
30-39	24	27.27
40-49	36	40.90
50-59	12	13.63
Marital Status		
Single	00	00
Married	88	100
Number of Wives		
One	28	31.81
Two	44	50.00
Three	16	18.19
Number of Children		
1-4	28	31.81
5-9	40	45.45
10-14	20	22.72
Educational Qualification		
Qur'anic education	36	40.90
Primary school	24	27.27
Secondary school	20	22.72
Tertiary level education	08	10.00
Occupation Types		
Irrigation farming	16	18.18
Rain-fed farming	28	31.81
Cattle rearing	10	11.36
Fishing	10	11.36
Trading	12	13.63
Other occupations	08	10.00

Source: Field Work (2023)

**Figure 2:** Sabke dam site at Yadi village, Mai'adua LGA on July 4th 2021.

Construction of the project started in 1998 under the defunct Petroleum Trust Fund (PTF) then headed by General Muhammadu Buhari (Rtd). The Sabke dam water supply and irrigation project was designed by

Emplane Limited as contracted by the PTF. The original concept of the dam was for it to support irrigation and possibly provide water for domestic use. Based on this, the project has three components of construction of the

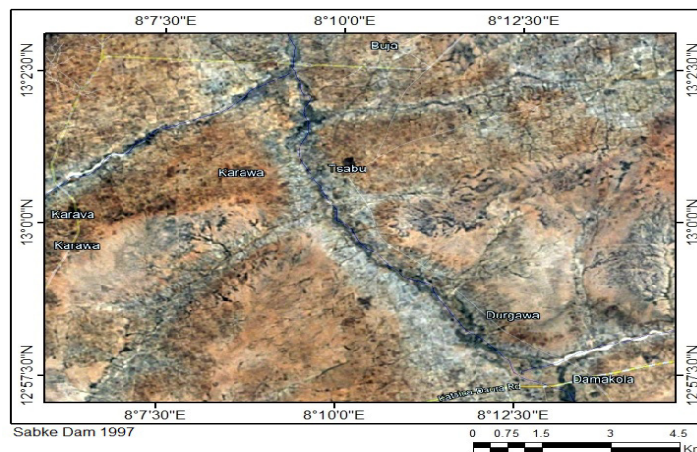


Figure 3: Satellite image of Sabke dam area before the dam construction in 1997.

dam, the water pumping station and the irrigation area (BBC, 2016). According to the respondents to the questionnaire, three companies were assigned one component each and work started in 1998. The Sabke dam was designed to provide about 51 million liters of water for domestic purpose to 17 villages and irrigation water to 1,200 hectares of irrigation land in Dutsi, Mashi, Mai'adua LGAs (BBC, 2016). The companies contracted to build the dam including Chinese constructing firm CGC and SCC were able to build the main and secondary canals at the irrigation site and a compensation reservoir at Dogon Hawa, a village 3kms from the dam site at Tsabu. Also constructed are 64 tertiary canals built with each having a control gate and an operating platform to supply water to various sites for irrigation purposes (BBC, 2016). According to the respondents, the companies then did quality work in line with the specifications of the PTF and as at the year 1999 when the PTF was scrapped by the administration of President Olusegun Obasanjo (1999-2007), about 70% of the project has been completed. The figure 2 shows the Sabke dam site at Yadi village of Maiadua LGA.

Sabke Dam area before the dam construction

According to the respondents at Tsabu and Yadi villages of Mai'adua LGAs the area where the dam was constructed is a river with elongated *Fadama* areas, flood plains or lowland areas along the river that floods on both sides that were used for cultivation of vegetables during the dry season. But as the dry season progresses the flood plains dries up and the farmers had to dig wells to access underground water to continue the cultivation by irrigation. Vegetable crop production was low due to limited water supply and the manual means of supplying the limited water. This was the situation in other villages

close to the flood plains in Daura and Mashi LGAs. Some villages and hamlets were relocated in order to construct the dam and they include Darugawa and Kamfawa in Daura LGA, Baderawa, Gangara, and Yadi in Mai'adua LGA. Some of the villages that were hamlets merged with villages. For example Kamfawa which was a hamlet merged with Darugawa which increased the population of the village. Other villages such as Tsabu in Mai'adua LGA, Unguwar Mata and Wazobia in Mashi LGA had to move some meters away from their previous sites to create space for the dam.

Respondents from Dogon Hawa where the dam's reservoir is built have recalled that the land area where the reservoir was built was the farmlands of some families which were acquired for the construction of the reservoir. The families were paid compensation by the defunct PTF after the construction as the people were willing to support the project to achieve its objectives. Before the dam construction, the people of the Dogon Hawa practice only rainy season farming as they are not close to the elongated *Fadama* area or the river flood plains. The people of Dogon Hawa due to their location away from the dam and along a major road leading to Mai'adua weekly market would have been the primary benefitting community had the Sabke dam project achieved its irrigation objectives. Figure 3 shows the Sabke dam area before the dam construction in 1997.

Figure 3 shows the satellite image of the dam area before the dam construction in 1997 when the dam area only consisted of seasonal rivers with elongated flood plains or *fadama* areas. At that time human activities were less comprising mostly farming activities within on the flood plains. Some forms of vegetation are found especially along the rivers as deforestation was less at that time. Figure 4 shows the Sabke dam area after the dam construction in 2022.

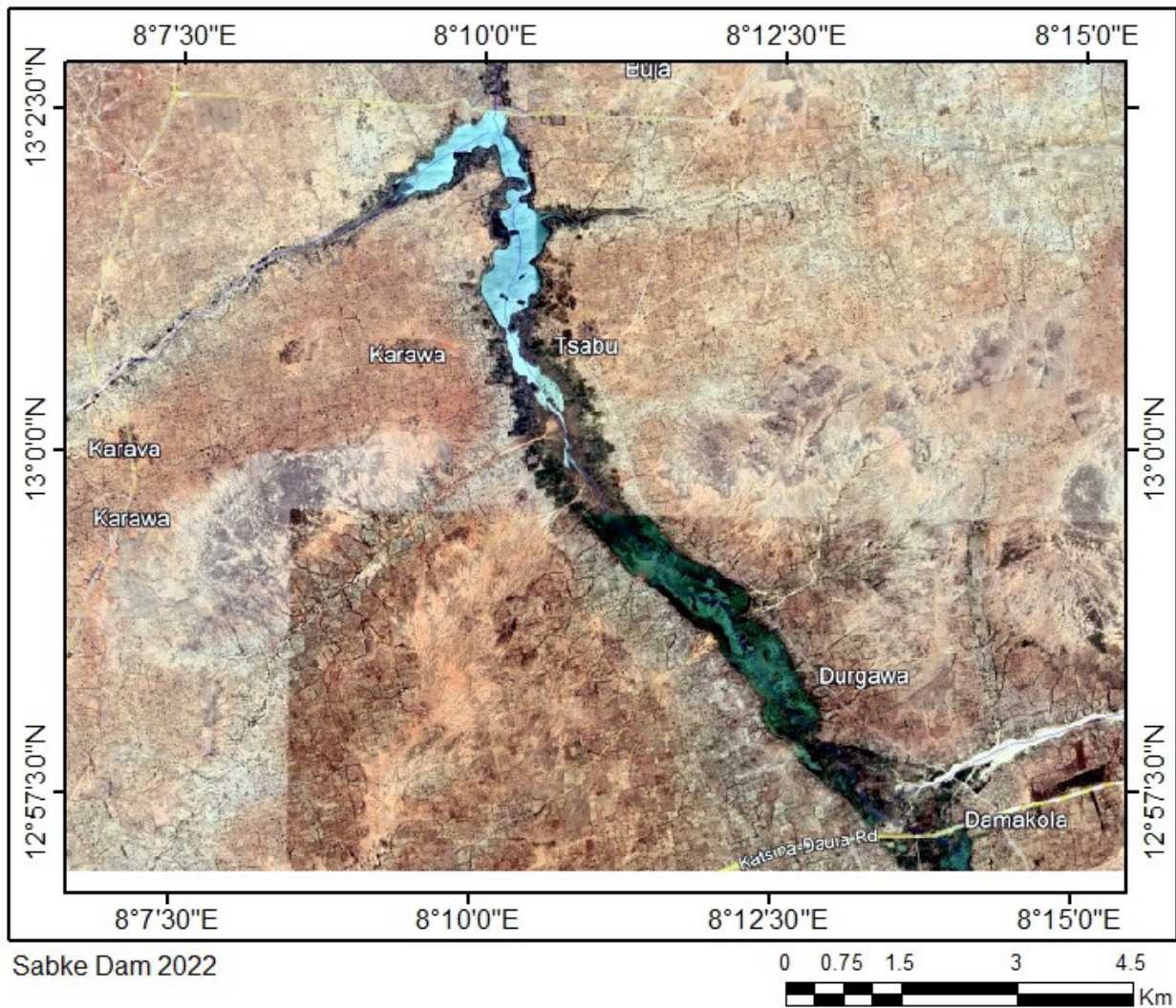


Figure 4: Satellite image of Sabke dam area after the dam construction in 2022

The main area where the dam water is occupying can be seen clearly at the northern part in light blue color. At this time human activities have increased due to the construction of the dam. The human activities include irrigation farming, cattle watering, water vending, more clearance of land for improved cultivation of irrigation crops especially vegetables. Most of the forms of vegetation have been affected by the human activities including cutting of trees for fuel wood as source of domestic energy. And the population has increased when compared to the time before the dam construction in 1997.

Sabke Dam area after the dam construction

According to the respondents, despite the non-completion of the dam within the period (1999-2018),

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(Figure 4) the people of the areas were able to benefit from the construction of the dam in the form of:

Irrigation farming

Water is available on the surface which can be used to irrigate farm lands at the dam site using water pumping machine connected to pipes to supply the water. Before the dam construction, the farmers had to dig some meters into the ground through a well to get water. More land is scheduled to be under cultivation with the availability of water and as mentioned earlier the dam was designed to irrigate 1, 2000 hectares in Dutsi, Mashi and Mai'adua LGAs. The irrigation farmers of different crops have organized themselves into cooperative societies in a move to obtain assistance of farming inputs from the government and Non-Governmental Organization

(NGOs) with little success. For example wheat farmers have formed a cooperative by name Kwarin Dan- Na Sabke Cooperative Society in August 2016 at Wazobia village in Mashi LGA.

Cattle watering

Water is available on the surface that is used for cattle watering which improves the rearing of cattle as they can come close to the dam to drink the water. Also the presence of dam water on the surface allows the growth of grasses on the edges which provide pasture for cattle rearing. Even during the dry season, irrigation crop wastes are used to feed the cattle thereby improving cattle herding as the herds no longer have to roam around in search of pasture and water. Furthermore, the specie of cows reared in Mai'adua LGA in particular are Red Bororo which attracts higher prices when they are paraded for sale. This is because the cow skin is soft and as such can be used as meat in form of *Kpomo* consumed widely at homes and food restaurants across Nigeria. The presence of the Sabke dam has improved cattle herding in the region which further enhances the status of Mai'adua weekly market as an international cattle market along Nigeria- Niger Republic boundary.

Water vendoring

The availability of water on the surface has created a form of occupation that involved fetching water in kegs for sale in the villages by water vendors. Before the dam construction, some of the water vendors engaged in grass cutting for sale and hired labor while the residents congregate around few wells to fetch water for domestic purposes. Due to the challenges of portable water supply surface water bodies such as the Sabke dam have become one of the few sources of water to the people of Mashi and Mai'adua LGAs. A study by Ladan (2016) on Mashi Earth dam has shown that due to the scarcity of portable water the raw untreated dam water is collected and transported by water vendors in kegs/jerry cans which are sold in the villages of Mashi and neighboring Mani LGA. There are also other people who come to the dam site to collect the water using kegs on wheel barrows for sale in villages around Mashi town (Ladan, 2016).

Improved cultivation of vegetables

The availability of water for irrigation has improved the cultivation of vegetables in villages such as Wazobia in Mashi LGA. Before the dam construction only 5-6 bags of pepper could be produced and after the dam construction the production rose up to 200 bags. It is as a result of the increasing cultivation of vegetables in the

Sabke Dam area that some concerned residents of Katsina State have called on the State Government to site a vegetable processing factory at Wazobia village in Mashi LGA along the Shargalle – Dogon Hawa- Mai'adua road to process the pepper and tomato that irrigation farmers cultivate in large quantity (Sundaita Post:2016). This factory can serve as a means of preventing post-harvest losses associated with some perishable crops such as tomato and provide jobs for some of the youths in the area.

Fishing activities

The construction of the dam has made water available where fishing is practiced by fishermen who catch some varieties of fish on the dam. In Wazobia village, there is a fish depot that sells raw and fried fish with some quantities transported to neighboring LGAs and Niger Republic. Some of the fishermen at the village even observed that there is the need for fish preservation facility for the storage of the large quantities of fish catch. At Tsabu village there is the Fish farming program center for Mai'adua LGA, one of the fish farming centers introduced by the then Governor of Katsina State, the Late Umaru Musa Yar'adua in 2005. To further boost fishing activities in the area, the Katsina State Agricultural and Rural Development Authority (KTARDA) spread 150,000 *clarias gariepinus* species of fish in the dam to improve the availability of fish in 2018. A study by Bala and Abdullahi (2011), observed that Sabke dam indicates positive indices for high fisheries potential and very stable aquatic ecology.

Water transportation

The construction of Sabke dam has divided village communities which at one time were living in the same area but the dam construction created a natural barrier between the communities. It is based on this fact that some people have constructed local canoes which they are using to transport people across the dam at a fee of N20 to N30. The canoes provide a means of transportation across the dam for example between Tsabu in Mai'adua LGA and Unguwar Mata in Mashi LGA. This serves as source of income and employment to those engaged in the water transportation. Though the canoes been used are local, they provide access to farmlands on different sides of the dam for farmers in particular who need to access their farmlands for farm work.

Completion of Sabke Dam as a boost to water resource management

After coming to power, at federal level in May 2015 the

government of the All Progressive Congress (APC) made efforts to identify abandoned projects that could be completed within the first term of the government. The Sabke dam water supply and irrigation project in Katsina state was among those identified and scheduled for completion under the Federal Ministry of Water Resources.

The contract for the completion of the project was awarded and work started in three stages namely construction of water pumping station, water treatment plant, canalization and clearance of irrigation sites as well as potable water supply (Daily Trust, 2018). The dam project was completed and commissioned on May 28th 2018 by the Federal Ministry of Water Resources; also in attendance was the Minister of Information and Culture including some state government officials. At the commissioning held at the dam's compensation reservoir at Dogon Hawa, the Minister according to Oyeyemi (2018) reiterated that:

(i) The Sabke water supply scheme is a conventional water treatment plant with a capacity to provide 4,77m³/day or IMGD of potable water to Daura and Mai'adua areas.

(ii) The Dutsi and Mashi water schemes are package plants with each having the capacity to provide 1,000m³/day or about 250,000 gallons of treated water per day to the inhabitants of the LGAs.

(iii) In all, the three plants have a combine capacity to serve over 100,000 people daily within the affected areas.

(iv) Provision has been made for the construction of 38 boreholes to serve all the villages along the Sabke-Daura water transmission pipeline.

(v) The project will achieve the objectives of providing access to potable water to the people living in the communities and the incidence of water borne diseases will be curtailed.

(vi) The Sabke irrigation has a gross area of 1,200 hectares for enhanced agricultural production. The irrigation facility has been fully completed and adequate post management plan is in process to hand over the project to Sokoto Rima River Basin Development Authority (SRRBDA) for irrigation farming by the benefiting communities.

Observations and complains of the benefiting host communities

According to the respondents the host communities of the

Sabke project have made observations and put forward complains based on the questionnaires administered for the study. They are:

Tertiary irrigation canals not erected

Following the news that the project had been completed and would soon be launched by the Honorable Minister. Youths at Dogon Hawa, the venue of the commissioning quickly went round to inspect the irrigation canals and observe that the tertiary irrigation canals had not been erected from their collapsed position and therefore water could not flow in the canals (Figure 3).

Leaking canals

The youths under the auspices of Dogon Hawa Youth Organization also observed that the canal joints were leaking for the remaining canals that were standing which meant that even if water was released, the water would leak down and could not flow to its destinations. This situation effectively means that there is no way the irrigation water can reach farmlands to be used for irrigation.

Faulty reservoir

At the compensation reservoir at Dodon Hawa, the mechanical device installed at the control gate was faulty and as such did not halt the flow of water out. This means the reservoir could not hold or store water and release it into the main canal for irrigation purposes. Also during field visits to the reservoir, it was observed that grasses and other forms of vegetation have grown inside the reservoir which could halt the flow of water out and which indicate lack of maintenance.

No portable water supply

The newly constructed water treatment plant at Yadi is supplying potable water to Daura Township only leaving the nearby villages such as Nasarawa and Tsabu with no water except the raw untreated water from the dam which is unhealthy for human consumption. The consumption of the raw untreated water from the dam has serious implications on the health of the people of the area which could affect their productivity in farming, fishing and cattle rearing.

Idle pump heads

At the water treatment plant, three large pump heads when opened supply water to Daura Township. The two other pump heads meant for Dutsi LGA villages of Shargalle and Kayawa were idle and not open at all.



Figure 5: One of the collapsed tertiary irrigation canals at the Sabke dam irrigation sites

This was because they have been linked to Dutsi dam for potable water supply. The Chief Supervisor at the Yadi Water Treatment Plant acknowledged the idleness of the pump heads and even informed the author that the pump heads can be opened to supply water to the surrounding villages if the permission of the authorities are sought.

Water supply pipes blocked

The underground pipes running from the treatment plant meant to supply potable water to nearby villages such as Tسابu and Nasarawa have been blocked. This makes it impossible for the people to get access to the water and have to rely on raw dam water and one borehole each which is inadequate in meeting the water needs of the people. In Karawa village of Dutsi LGA for example, as at the time of the visit, there were two boreholes and one had stopped working. Even if the two are working well, they were not enough as people from other villages also fetch water from the boreholes.

Planned peaceful protest

Following the observations particularly on the irrigation components of the dam project, the youth organization of Dogon Hawa village planned to complain that the project was not completed (Figure 5). This they planned to do in

the form of displaying a placard to the invited guests and members of the press on the day of the commissioning of the project May 18th 2018. The placard inscription reads “We are not in total support: Dear Government Please Don’t Say Yes to the Work of Sabke Dam. It Has Not Been Done At All” by Dogon Hawa Youths Organization on behalf of Daura Zone People. But a team of security forces comprising mobile policemen and the army were deployed which stopped the displaying of the placard.

Periodic shortage of water at the dam

The benefiting communities have observed the shortage of water at the Sabke dam. This according to them was due to lack of dredging and the construction of other dams such as Dutsi and RijiyarTsamiya which reduced the inflow of water into the dam. The low water volume at the dam was evident during the third field visit held on July 4th 2021 when the rainy season had not fully been experienced at that time. However, in during the dry season period in 2024 it is observed that the water level in the dam has increased as a result of the bursting of the RijiyarTsamiya dam and the flooding of Dutsi and Daberam dams which added more water into the Sabke dam. A study by Ladan (2019) has indicated that most of the dams in Daura and Mai’adua LGAs are affected by shortage of water primarily due to silting of the dams and

the streams that drains into the dam result of their location not far from the Sahara desert in neighboring Niger Republic.

Financial loss to farmers

The benefiting communities were complaining that the decision of irrigation officials had brought financial loss to them. For example, the pumping of irrigation water to downstream users in November 2019 made the dam water to recede leaving planted vegetables without water that later withered and died. Again in April 2021, the irrigation officials informed some of the farmers at Dogon Hawa that the challenges associated with the irrigation component have been tackled. The farmers were then given rice seeds to plant on their farms which they did but insufficient water was supplied leading to the loss of the crop.

Limited irrigation area

Despite the published completion of the dam project irrigation farming is only possible on farmlands close to the dam. This is because irrigation water cannot be supplied to farmlands away from the dam which has drastically reduced land underutilization. The result is that most of the youths in the benefiting communities migrate to southern Nigeria for seasonal work (called *chi rani* in Hausa language) during the dry season.

Failure to provide potable water

The benefiting communities are complaining that the failure of the dam project to provide them with clean, potable water has led to the outbreak of disease associated with using raw untreated water. The diseases include guinea worm and bilharzia which shows that the incidence of water borne disease is yet to be curtailed as envisaged.

Recent Efforts by Members of the Federal House of Representatives to Revitalize the Project

The Member of the Federal House of Representatives representing Daura and Mai;adua Constituency moved the motion on the need to revitalize the Sabke Dam Project in view of the insufficient access to the water resources that is crucial to agricultural development of the area (LRM, 2023). The motion was seconded by the Representative of Mashi and Dutsi Local Government Areas Federal Constituency in the house. The motion noted on the need to revitalize the Sabke Dam Project by:

- (i) Conducting 7km upstream and 3km downstream de-silting and river draining operation to optimize the reservoir inflow by mitigating sedimentation and drainage thereby enhancing agricultural output.
- (ii) Expanding access to potable water supply which will ultimately enhance the livelihood of the people of the four local government areas in the northern part of Katsina State.
- (iii) Restore and rehabilitate irrigation facilities in terms of the water storage reservoir and irrigation canals through the prompt revitalization of the Sabke dam project.
- (iv) Revitalizing the Sabke Dam Project will hold immense potentials to yield substantial benefits in terms of crop production, fisheries development and cattle watering to the four local government areas and their environs.

The motion was voted on and adopted with amendments and then referred to the House Committee on Water Resources for legislative compliance.

Conclusion

In Nigeria, successive administrations have made dam construction an integral part of domestic water supply and irrigation as a means of boosting health care and food production. The Sabke dam water supply and irrigation project is an important water resource management project located in arid northern part of Katsina State. The completion of the dam project after twenty two years of being abandoned is a welcome development which is appreciated by the benefiting communities. However, the results of the study found out that potable water is only supplied to Dauratowship, the boreholes constructed along the transmission lines are inadequate, irrigation water cannot be pumped to farmlands, the irrigation canals have not been repaired and irrigation farming is practiced only in farmlands close to the dam. Recent developments have indicated that SRRBDA is making some efforts by mobilizing community members to erect the irrigation canals from their collapsed positions. And also to extend electric power supply from Shargalle in Dutsi to Yadi to pump water directly to irrigate lands far away from the dam. But these efforts have not become effective in tackling the challenges facing irrigation farming in particular. Therefore the Federal Government should undertake a comprehensive assessment and evaluation of the completion of the project with a view to making the project achieve its objectives.

Recommendations

The following recommendations are offered towards full

utilization of the Sabke dam project for domestic and irrigation water supply:

(i) The Federal Government through the Federal Ministry of Water Resources should constitute a powerful team of experts who can assess the level of work done and undone with a view to finding where the problem lies concerning the project.

(ii) The Katsina State Government through the State Ministry of Water Resources should ensure that the remaining two tap heads for water supply at the Yadi Water Treatment Plant are opened for supply of water to nearby villages of Tsbu and Nasarawa.

(iii) The State and Federal government should assist the communities along Sabke-Daura and Sabke-Dutsi water transmission pipelines with the repairs of non-functional boreholes and provision of more boreholes in areas where they are inadequate.

(iv) The Sabke dam should be dredged with a view to boosting the capacity of the dam to store more rain water. This is very important considering the location of the dam and the growing number of users of the water resource.

(v) The State Government should construct the 12kms Tsbu to Dannakola road with a view to providing direct access road to the dam from the Katsina to Daura highway. The road when constructed will assist irrigation farming, fishing activities and cattle rearing in improving production.

(vi) The State Ministry of Agriculture should carry out a feasibility study with a view to establishing a vegetable processing factory at Wazobia village of Mashi LGA and a fish processing plant at Tsbu village of Mai'adua LGA.

(vii) The State Government through the Katsina State Agricultural and Rural Development Authority (KTARDA) should strive to improve irrigation farming and fishing activities in the Sabke dam project area. This can be done through the provision of farm inputs at subsidized rates to farmers, establishing a veterinary clinic and supply or introduction of more fish species in the dam.

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