SOCIO-ECONOMIC IMPACT OF SHIRORO HYDRO ELECTRIC DAM ON THE DISPLACED AND RESETTLED INHABITANTS OF ZUMBA COMMUNITY, NIGER STATE, NIGERIA

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Abstract

Resettlement in most cases occurs due to developmental purposes as the case of Zumba community in Niger State which was relocated from its original place to the present place to give way for construction of hydro-electric dam. Other resettlements happen because of environmental disasters such as flooding, earthquake, etc. Zumba community was purposively selected because of its closeness to the dam and river side and thus come under direct influence of the dam. This paper examines the socio-economic effects of Shiroro Dam on the resettled people of Zumba community. The major socio-economic parameters used in examining the effects of the dam on the inhabitants include farmland expropriation, compensation, occupational changes, housing, income possessions, floods and basic social amenities before and after the construction of the dam. Reconnaissance survey was the first step used in order to identify the nature of settlements, formulation of field investigation and working schedule. Questionnaire and interview methods were used in data collection. Eighty (80) respondents were administered with questionnaires in the study area. Both open-ended questionnaire and interview were used. The results were subjected to simple statistical tools such as percentage tables, bar graphs, and (X^2) correlation statistical test. The results revealed more positive change at present in the socio-economic life of the inhabitants compared to the past than the negative. It also show improvement in the area of housing, income possession, market creation, employment generation, water and power sources, etc.

Introduction

A dam is a structure designed and constructed across a river as an effective means of controlling the flow of a river and storage of water for generating electricity, irrigation or for domestic a societal requirement. Dams have influenced the rise and fall of civilizations. (Abubakar, 1997).

The creation of large man-made lakes in Africa has been responsible for the relocation of large number of people. For example, some 50,000 people were displaced by the Kariba Dam, purpose. Dam construction became a necessity when the assurance of dependable sources of water became over 70,000 people by the Volta Dam, over 100,000 people by the Aswan High Dam, Lake Kainji in Nigeria displaced 42,000 people, 30,000 by the Turkey's Keban Dam, 30,000 were also displaced by the Thailand's Lebalratana and Pamong Project in Vietnam uprooted 450,000 people. (Gaza Sunday and Others, 2008).

Through history, man has been settling and resettling in different places either voluntarily or due to disaster like famine, flooding, earthquakes, war, etc. When he moves willingly, he takes care to choose for himself a place which suits his convenience and interest. During such a movement, people chose to move because of natural disaster, so as to take a disruption philosophically and resettle through their own efforts, willingly making sacrifices, provide for themselves. For example, the collapsed of Goroyon dam in 2010, caused flood which displaced thousands of farm settlers in Sokoto area. However, as a result of national policy, it becomes necessary for people to move in order to make room for development which will benefit not themselves but the society as a whole. In such circumstances, they expect and demand that arrangement be made

for them which will satisfy their social and other needs, and which will make them better of than before.

In Nigeria, the case is not different as government has made series of efforts to resettle people for the establishment of Dams. Shiroro Dam is one of the dams affected by such government policy when it was constructed (1978). In recent years, dams of all sizes have been constructed and these have both positive and negative consequences in the area.

Tyabo (2005) defined hydroelectric dam as a wall built across a river or stream, glaciers, natural falls to stop the flow of water and form an artificial lake or reservoir to generate electricity from the energy of running water. He also observed that "ideology, ethnicity and power conflicts are all important factors aggravated by environment stress". This is demonstrated as authorities of National Electric Power Authority now Power Holding Company of Nigeria remains adamant and reluctant in taking measures to meliorate the suffering of displaced client communities.

Statement of the Problem

Zago (1999) identified the negative effects of the Cameroonian Lagdo Dam on the downstream environment to include siltation of river bed and water intake in the Benue river loss of fadama and navigation constraints. He also identified the positive effects of the Lagdo dam on the downstream River Benue to include flood control and irrigation.

Williams (2000) opined that the social impacts of dams on downstream environments are particularly significant in extensive floodplain wetlands formation for example, those of arid or semi-arid Africa such as the major wetlands in Delta interior of the River Niger in Mali and Lake Chad on the border between Niger, Chad, Cameroon and Nigeria. On the same vein, Abubakar (1997) observed that the storage of water of the reservoirs in the three hydropower dams (e.g. Kainji, Jebba and Shiroro Dams) in Niger State have caused serious change in water quality. For example, there is lowering of air temperature by as much as $3^{o}C$. The temperature of water on the other hand increased by $1^{o}C$, while alkalinity increased by about 3mgK and the difference is hardness reduced by 2mgK. This difference in water quality between the dam sites and the river upstream might cause a lot of discomfort to fish production too.

On Tiga Dam, Olofin (1980) in (Zago 1999), revealed that situation of the dam reservoir had became more rapid than had earlier been projected. This was attributed to land use changes and erosive rainstorms in the catchments basin of the reservoir. He added that for the maintenance of good quality water, with less situation problem on the reservoirs, there is need for good land use management in the source regions of all basins.

Social problems are caused by as displacement of people from their original homes to give way for dam construction, destruction of historical monuments or permanent loss of farmlands due to flood that created association with dam construction (Abubakar, 1997). He is also of the view that the merger of two or more different communities brings about elimination of culture because the culture that dominates is often widely accepted. Some of the historical sites and monuments are lost as a result of inundation of land. Examples include the sacred Juju hill at Dokkoku and golden boats of Isoede are monuments that have completely been submerged as a result of Jebba dam.

Other social problems at downstream area as identified by (Williams, 2000) include poverty, emigration, reduced nutritional status, ill-health etc. While economic problems include decrease in fish production, risk to downstream communities, increased incidence of human parasites and disease.

Ferradas (1999) maintains that a major positive economic impact of dam construction is the creation of new economic activities in rural and urban areas. If properly serviced and regulated, however, these can themselves cause significant impacts on downstream environments.

Economic problems could be attributed to the cost which impose an intolerable burden on the countries that built them where proper cost-benefit ratio had not been previously determined. (Abubakar, 1997).

Where dam construction has entailed relocation of local populations, the financial, social and psychological cost to the people have been unavoidable high (Light, 2007).

One of the main problems of agriculture is the loss of land. Resettlement schemes bring about loss of agricultural land for the purpose of development (Peter, 2000).

Olawepo (2000), observed that the construction of Jebba dam caused the resettlement of some villages far away from their farmlands and therefore, change their occupation to trading and local craftwork. He further said that their new jobs do not bring full satisfaction and hence, the income outcome cannot be compared with the later. This has constituted so many problems in the new environment.

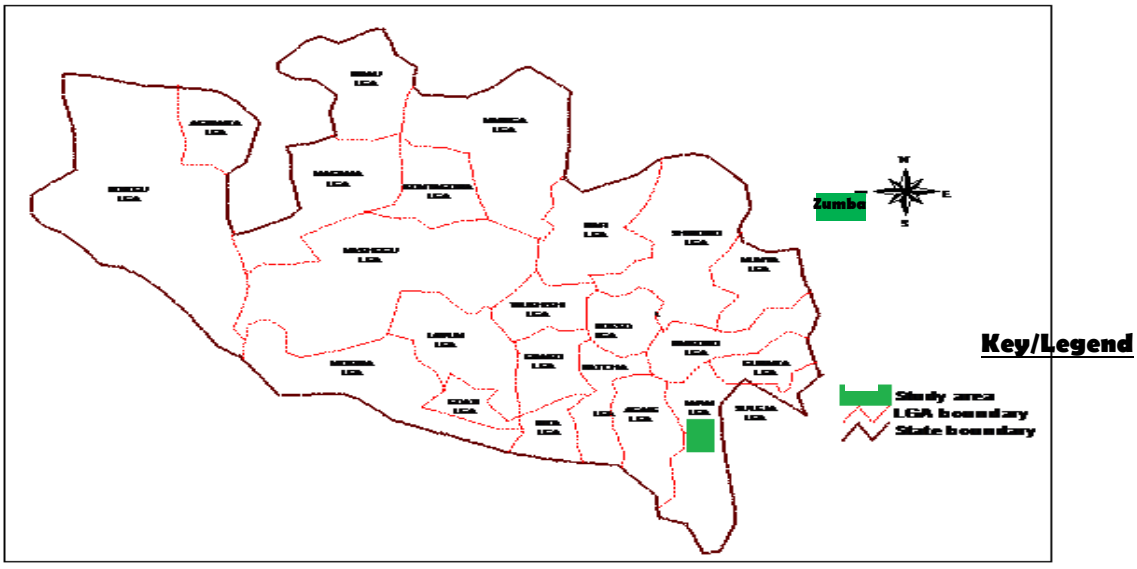
Compensation of the resettled people is very important because it is meant to cover damages caused by the scheme. Usually compensation covers the physical assets, farmlands, economic trees and even houses. The victims are supposed to use compensation to develop themselves and continue to transact business to earn a living but the process of compensation in most resettlement schemes is a failure (Nedeco, 1979). Nedeco (1979) added that there is evidence of corruption and inordinate delay in the payment of compensation, which is much below the market rate at the time of displacement.

Disease outbreak is another common problem of resettlement as the case of Bakassi have made it clear to the committee led by Senator Florence Ita-Giwa (Ernest, 2008). This is the mission of this research. In view of the above problems, that is mission of this research.

Location and Description Of The Study Area

The study area is situated some 65 kilometres away from Minna, the Niger State capital. Geographically, the area lies on latitude 9^{o}N and longitude 7^{o}E in the Guinea Savanna Zone of the Middle Belt of Nigeria as shown on the map below.

Fig. 1.1: Map of Niger State showing the study area (Zumba)



Source: Drawn by Zacharia, GIS Lab, Geography Department, FUT Minna (2011)

Zumba is an old rural town with a history dating back to early eighteenth century. Traditions have it that Bodo (a Kanuri hunter) and a great administrator who is credited with the founding of Zumba, came from Eastern Nigeria (Borno) in a hunting expedition. He first settled around Dangunu before finally moving to old Zumba where he met the indigenous Gbagi people and decided to settle among them. Thus, the population of Zumba is predominantly Gbagi and they account for about three quarter of the people of the town, other tribes include Hausa, Yoruba, Igbo, Fulani, Nupe, etc.

Politically, the people of Zumba are well organized and have their credited long history of separation and resistance to any external aggression. Traditions and documentary evidences confirmed that Zumba people have been subjected to many forces of conquest. It is however, on record that they maintained a "close and mutual relations with Zaria and Abuja during the 18th Century". Presently Zumba is headed by a chief who is the commander and oversees the affairs of the community. (Inuwa, K.G. 2008).

Aim and Objectives of Study

The aim is to identify and examine the major issues associated with the displacement and resettlement of Zumba community due to Shiroro Dam construction and to offer recommendations based on the findings.

The following objectives will assist in achieving the above aim:

(a) To identify the major displacement and resettlement issues of Zumba community.
(b) To examine the issues associated with the resettlement.
(c) Make recommendations for sustainable development

The paper covers test of the hypothesis that there is no significant socio-economic difference in the present living situation of the inhabitants of Zumba community compared to the past i.e. before dam construction.

Methods of Study

This covers techniques of data collection and analysis.

Purposive Sampling: Zumba is selected for its closeness to dam and stream (River Kaduna). This selection will help to assess effects of dam in relation to its closeness. A total of 80 respondents were randomly selected because of the homogenous nature of the study area. The questionnaire was administered principally to find out some of the socio-economic prospects and problems encountered as a result of the dam construction. The items included in the questionnaire are the occupation, compensation, land holding size, housing, income, socio-cultural monuments etc.

Methods of Data Analysis: Simple descriptive statistical tools such as tables, percentages, bar graphs and most importantly, chi-square (X^2) statistical test were used in data analysis. These helped to identify the significant differences that exist between the past and present situation of the settlers.

Results and Discussion of the Findings

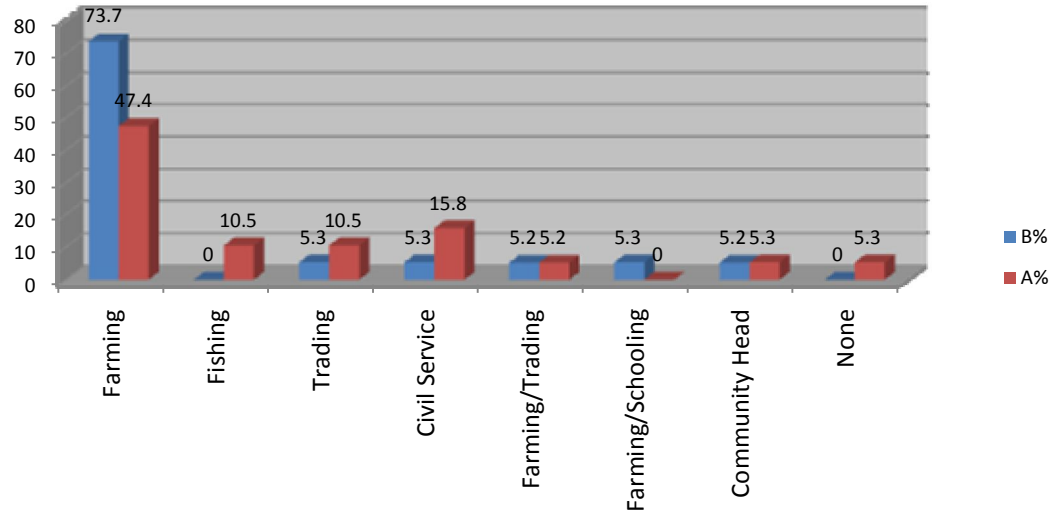
The results presented, described and analyzed for these findings focus on the benefits or otherwise Shiroro Dam construction had on the inhabitants of the study area. The analysis is essentially based on the socio-economic conditions of the people. The research compared the situation before and after the dam was constructed.

Occupational Characteristics of the Study Area (Zumba)

By the nature of the area under study, it would be assumed that majority of the inhabitants would be farmers. *Note that (B) stands for before and (A) stands for after in the figure 1.2 below.*

The figure 1.2 below shows the occupational distribution of respondents before and after dam construction.

Figure 1.2: Occupational distribution before (B) and after (A) the construction of Shiroro Dam in Zumba community



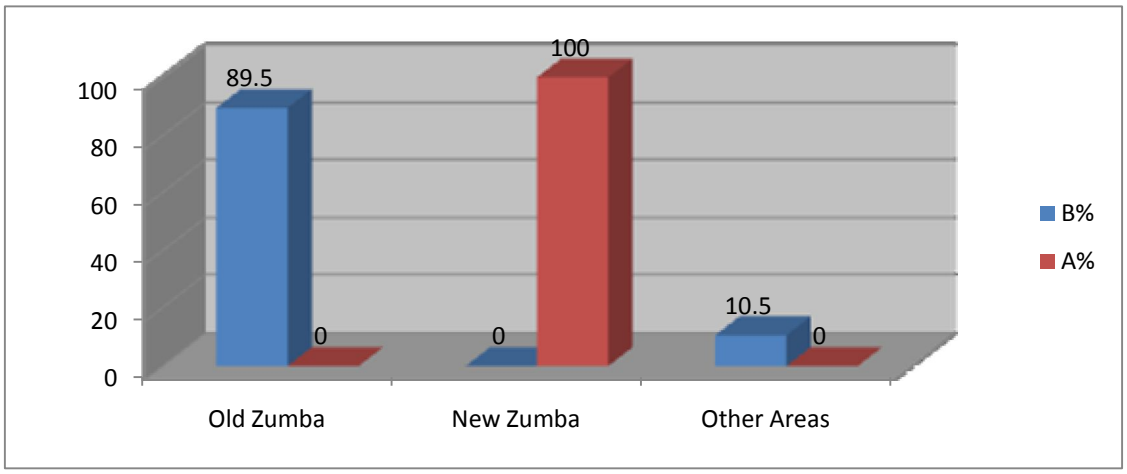
Source: Field Work, July, 2010

From figure 1.2 above, it is clear that majority of the inhabitants of the study area were farmers remain so even after the construction of the dam. Farming occupation constitutes the highest percentage. However, there is a drop of farmers by 26.3%. This indicates that some inhabitants' lands were expropriated. Dam construction had also disengaged some people from farming to other occupations such as trading, fishing, civil service, etc.

Displacement and Resettlement Of Zumba Community (1978 – 1981)

By nature of the present settlement pattern that is fairly nucleated, one would observe that most of the inhabitants were displaced from their original land and resettled. Figure 1.3 justifies the reality.

Figure 1.3: Displaced and Resettled of Zumba



Source: Field Work, 2010

Evidently, settlers of the New Zumba community were completely dislocated from the Old Zumba.

Chi-square (x^2) result also shows a significant change in the location. The calculated value is greater than the critical value thus, the hypothesis is rejected. See the table below:

Table 1.1: Chi-square results on displacement and resettlement

Settlement	Chi-Square Value
Zumba	38.0**

* Significant at a = 0.05
** Significant at a = 0.01

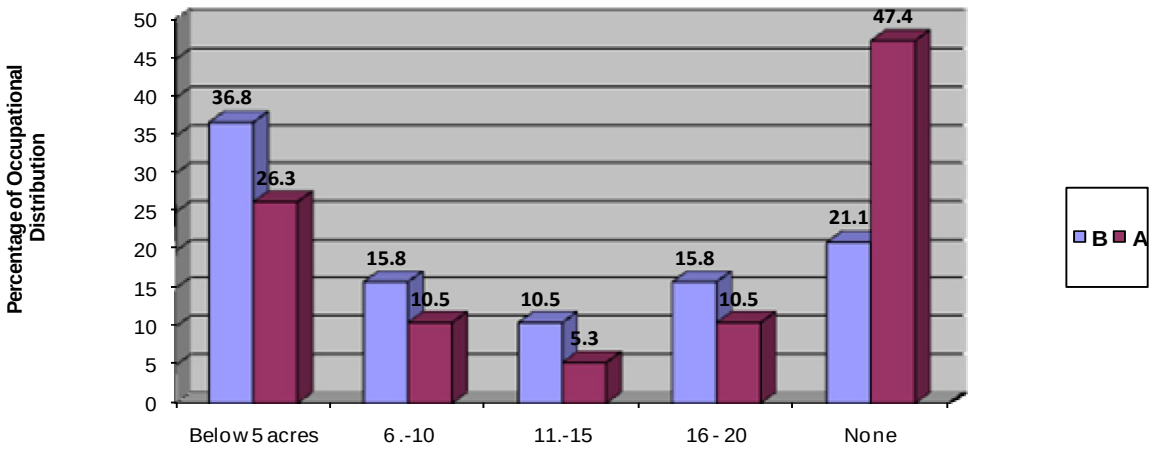
The two plates below show the old and new sites view of Zumba community.

Source: Field Work July, 2010

Ownership of Farmland in Acres:

The people of the study area are small holder farmers. Figure 1.4 shows the farmland ownership measured in acres i.e. measured with tape.

Figure 1.4: Ownership of Farmland in Acres (Measured 43,560 sq. feet per Acre)



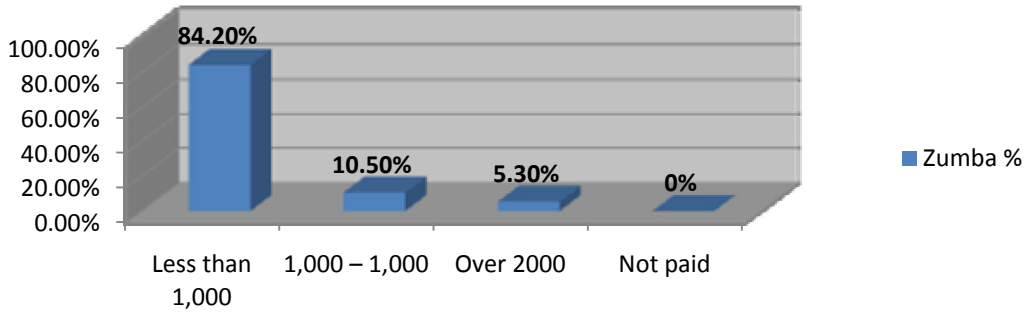
Source: Field Work, July, 2010

The above figure revealed that most settlers of this community were small holder farmers before and are still small holders after the construction of the dam. However, there is a drop of 10.5 in category one so also category 2, 3, and 4.

Compensation Payment

For the purpose of justice and fairness, it is expected that the government through the scheme would have paid adequate compensation to the victims of lands expropriated which completely displaced Old Zumba. Before cash compensation, opinions were sought from the peasants by the scheme on whether they should be paid cash or built and provide social amenities for them. The peasants chose to be paid cash. Figure 1.5 gives a breakdown of how compensation was paid in cash.

Figure 1.5: Categorization of respondents according to the amount received as compensation in Zumba (1981)



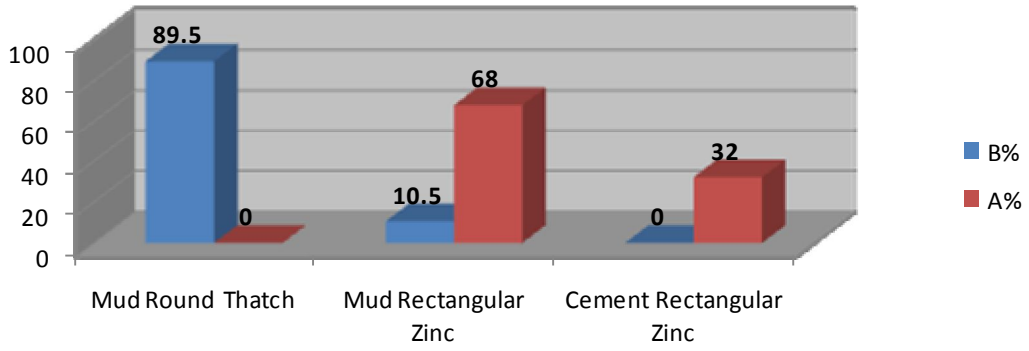
Source: Questionnaire Survey, July 2010

From the figure, those who received less than ₦1,000 constituted the majority. The compensation was said to have been paid by NEPA authority for their abandoned buildings, economic trees and farm crops. There were few people who received over ₦2,000. According to the treasury staff, Shiroro Estate Department, the sum of ₦20,000 in 1980 could build only one bedroom apartment with local materials and zinc.

Housing Type in Old and New Settlement

In order to probe whether the cash compensation was enough for them to build compared to what they had before, the figure below shows the responses of their housing types before and after the dam.

Figure 1.6: Housing Type in Old and New Site



Source: Field Work, July 2010

It is clear from above figure that the present living condition in respect of the housing type, compared to the past, is better since most of them lived in mud round thatch roof houses prior to dam construction. One important thing discovered from the figure is that, there were no cement rectangular zinc houses. This is an indication of a positive impact. See Plate 2.

Chi-square (x^2) test also proved that there is significant difference in housing types now compared to the past because the calculated value is greater than the critical value.

Table 1.2: Chi-Square Result on Housing Type

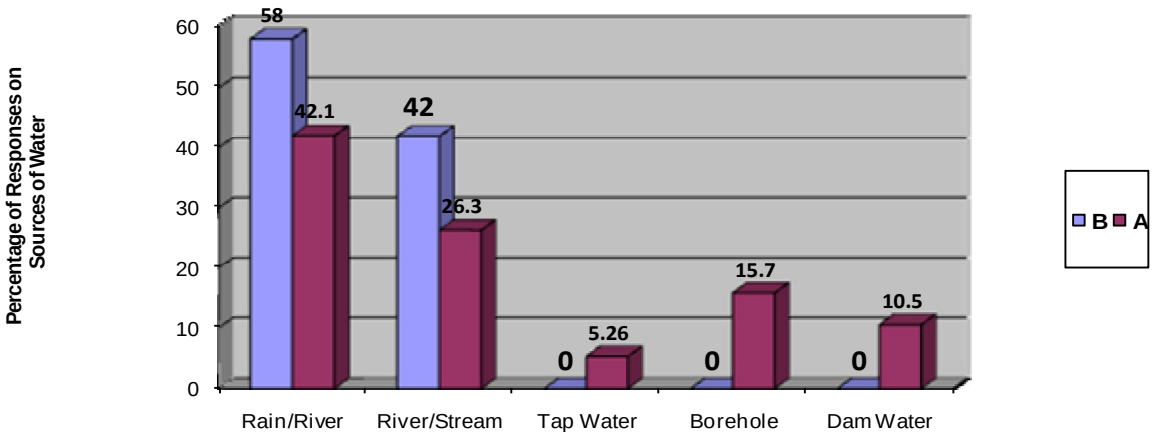
Settlement	Chi-Square Value
Zumba	31.1 **

* Significant at a = 0.05
** Significant at a = 0.01

Source of Water

Investigation was also conducted on the source of water for household uses before compared to the present. The aim is to discover whether there are differences or changes that may affect their living condition.

Figure 1.7: Responses for area of sourcing water before and after the construction of Shiroro Dam



Source: Field Work, July, 2010

The result from figure 1.7 revealed that most of the inhabitants relied on rain, river and stream water before the dam project. This has reduced now because of the presence of other sources of water supply such as tap and borehole put in place by the Niger State Government. The users of rain/river and river/stream dropped to 15.9% and 15.7% respectively.

Fish Market as a Benefit Derived from the Study Area

Fishing in other parts of the world is virtually done for commercial purposes. Prior to the construction of Shiroro Dam, there was little or no fishing in the study area, but today, the field investigation reveals that some Zumba people involved in fishing. See Figure 1.2.
Fishing has led to the creation of Kwata market which is close to Shiroro dam at Zumba. It is located almost adjacent to New Zumba town.

Market survey revealed that it is a periodic market that operates every Saturday. The market came with the dam construction. Both smoked and fresh fish are sold at the market. People from Mali and Niger in West Africa as well as from major towns in Nigeria such as Abuja, Kaduna, Minna, Suleja, etc. patronized the market. This level of patronage has led to increased price of fish in the market. It was found that a small basket of smoked fish that used to cost only ₦2,500 to ₦3,000 as at 2006, is now ₦5,000 to ₦7,000. See Plate 3 and 4.

From Surrounding Communities to Zumba Kwata Market

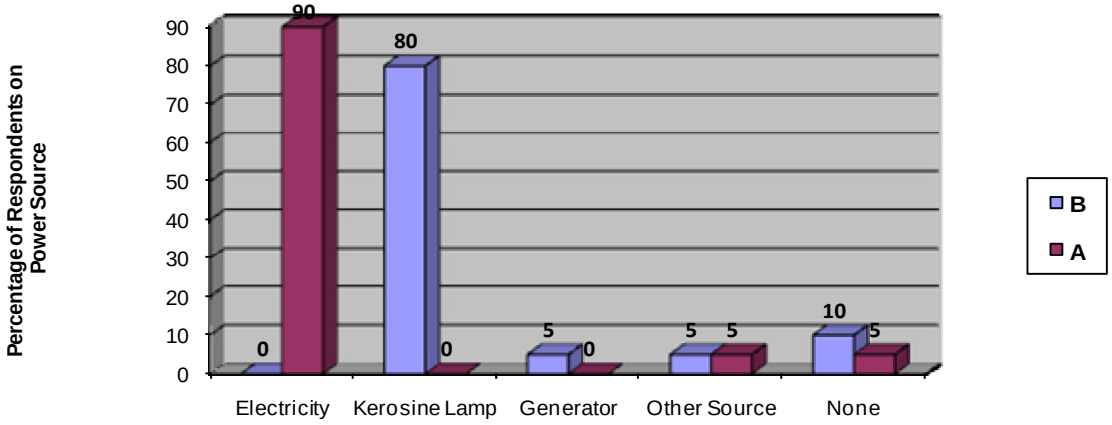
Source: Field Survey, July, 2010

Other benefits from the market include income and revenue generation, fish serves as food, transport development, employment, etc. However, the market is not stationary because as the water from the dam spills over and over floods, the market shifts.

Power Source Before and After the Dam

The main objective of the dam was to generate electricity for the country. Figure 1.8 reveals how far scheme had contributed to this especially the study area.

Figure 1.8: Responses for power source before and after Dam in Zumba



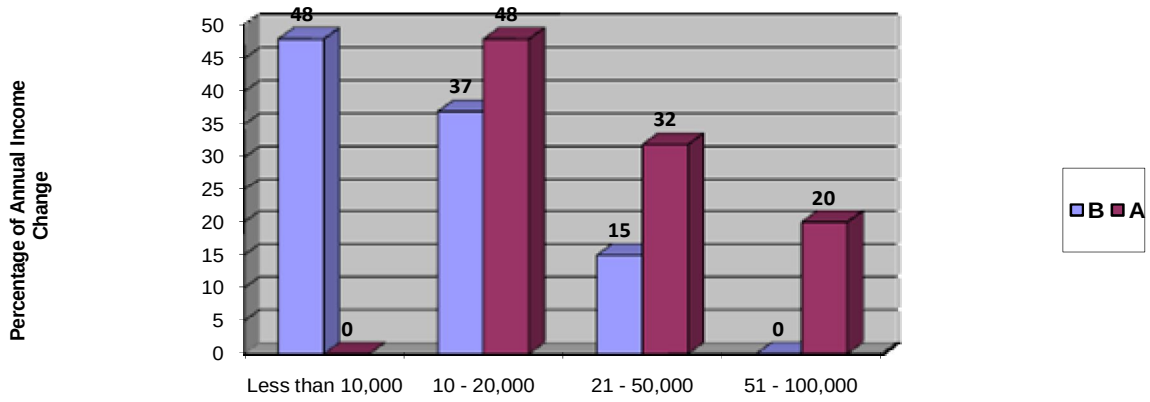
Source: Questionnaire Survey, July 2010

The study area has tremendously benefitted from electricity.

Inhabitants Annual Income Changes

There are indications of increase in annual income at present compared to the past. See the figure 1.9 below:

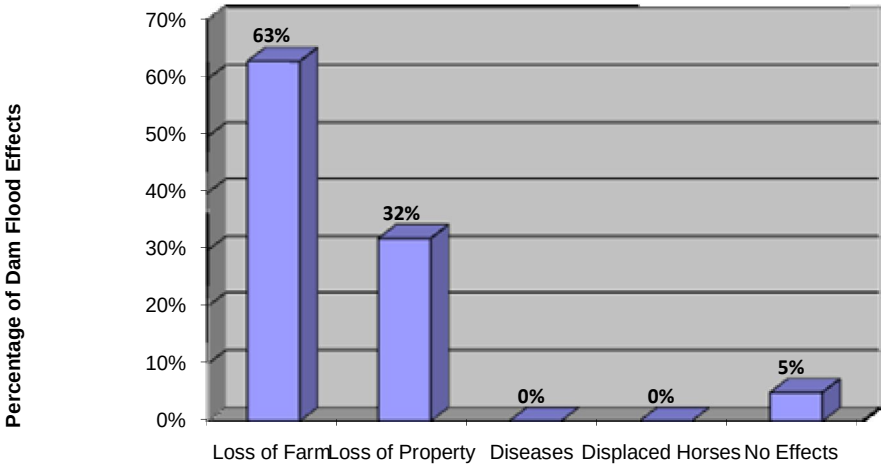
Figure 1.9: Changes in annual income



Source: Questionnaire Survey, July 2010

This increase in annual income is as a result of improvement in other job opportunities e.g. trading, civil service, fishing, etc. as earlier pointed out in Figure 1.2. This increase, however, do not point to real income. For example, ₦5,000 in early 1980's could buy a new brand 504 Peugeot car which ₦500,000 (half million Naira) cannot buy now.

Figure 1.10: Effects of Shiroro Dam floods on the study area



Source: Questionnaire Survey, July 2010

The above figure reveals that farmland is mostly affected by floods. This is basically attributed to the spill over flood during rainy season especially September and October when dam reached its maximum (full) capacity due to heavy downpour of rain water at this period. Those practicing irrigation along the river valley are the victims of the flood.

Summary and Conclusion

In summary, the aim of the research is to assess the socio-economic conditions of the displaced people of Zumba community so as to identify the positive and negative changes that have taken

place following the construction of Shiroro Dam. The socio-economic parameters used for this assessment are occupational characteristics, land holding size, housing type, water, power supply, income, flood, marketing etc.

The methods used for data collection are random sampling technique, open ended questionnaire and interview while percentage tables and charts were used in illustrating and assessing the parameters. The chi-square (x^2) test was also used to analyze some parameters. From the results, the dam project has brought about positive impacts in the area of housing type, fishing occupation, good water and power supply, improvement in annual income, creation of fish market, etc.

In conclusion, the Shiroro Dam Project as a whole is a desirable scheme. Evidently, the results of this study have shown that the dam has more positive effects than negative effects in the study area. Dam projects invariably change the human environment thus real question is not whether a dam will affect the environment but how much change is acceptable to the society, especially the locality where it is situated and what measures should be taken to keep the adverse changes to a minimum and within acceptable range.
To ensure wise resources management, it is necessary to measure the effects of dam projects on social and economic systems in order to determine the desirable ones in relation to human environment which this study has shown.

Recommendations

In view of the effects of Shiroro Dam on Zumba community:

(i) Revenue generated from dam and Kwata fish market by the Shiroro Local Government, Niger State Government, as well as electric bill should properly be utilized for education, transport, health, good water supply for the victims.
(ii) The provision of these amenities for the resettled area is necessary to improve their welfare since they have sacrifice for others to enjoy.
(iii) The collection and disbursement of such revenue should be properly monitored by the concerned authority to ensure adequate and right usage.
(iv) More and prompt enlightenment about the period of floods and its consequences should be given to settlers among the river banks.
(v) More channelization of the main river at the downstream should be done to reduce the incidence of over floods.
(vi) Cash and material loans can be granted to the affected people for co-operative farming, fishing and other occupations to boost their socio-economic well-being.
(vii) Further research should be carried out by scientists in other disciplines such as biological, chemical and physical so that firmer conclusion can be drawn.

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