SOCIO-ECONOMIC CHARACTERISTICS OF THE FISHERMEN OF BAKOLORI RESERVOIR IN ZAMFARA STATE, NIGERIA

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ABSTRACT

A study was conducted to assess the socio-economic characteristics of the fishermen of Bakolori reservoir in Talata Mafara Local Government Area of Zamfara State in Northwestern Nigeria. In July 2012, a field survey was conducted in which 10 fishing villages were purposely selected in Maradun Local Government, 10 respondents were randomly selected from each of these villages and interviewed. A structured questionnaire was used to collect information from the fishermen. The data collected was subjected to descriptive statistical tools (means, frequencies and percentages) analysis using SPSS software application version 16.0. The results revealed that all (100%) of the fishermen were Muslims, males and Hausas, 55% were within age class of between 19 and 40 years old. Literacy level among the fishermen shows only 26% and 8% had primary and secondary education. Majorities (97%) were full time fishermen and 30% had 30-40 years of fishing experience in the reservoir while 78% also engaged in farming. Majority (73%) of the fishermen used to catch 8-78kg of fish while only 2% caught between 292kg per week and 433kg per week. The fishermen who used to earn between 11,000 and 19,000 naira during high floods per week constituted 68% while 78% earned no kobo but some days earned up to 5,000 naira during mid-dry seasons. Only few (16%) had obtained bank loan facilities in the past. Based on findings from this study, it was concluded that the fishermen of Bakolori reservoir had similar socioeconomic characteristics with other artisanal fishermen in Nigeria. These findings had provided the much needed baseline information which could be used to set priorities for future fisheries planning and research in the reservoir.

Key words: Socio-economic characteristics; Bakolori Reservoir; Artisanal fisheries

INTRODUCTION

Fish production in Nigeria, like in many other third world countries is a source of poverty reduction or total eradication (Neiland, 1997), source of food (FAO, 2000; Oparinde *et al.,* 2014) and it is undergoing some form of modernization (Francis, 2002; Bolorunduro, 2003; Richard and Balirwa, 2004; Isaac, 2013;). Inland water fisheries both captured and cultured are good sources of cheap animal protein for low income coastal and

rural populace (Richard and Balirwa, 2004; Oparinde *et al.* 2014). Apart from being used as food, fish is also increasingly demanded for use as feed ingredient in the livestock production and manufacturing industries (FAO, 1996; Delgado *et al.*, 2003; Sotolu, 2009). In addition, the fishery resources provides employment indirectly through fish marketing and distribution, fish processing, net making and boat construction, therefore generating income to artisanal fishermen (Francis, 2002; Richard and Balirwa, 2004; Tafida *et al.,* 2011; Nwabeze *et al.,* 2013).

Despite the relevance of fishery resources for the sustenance of most fishing and non-fishing communities in third world countries including Nigeria, the resources have been allowed to degrade slowly and continuously for decades (Aida *et al.,* 1985; Akpoko, 2003; Richard and Balirwa, 2004; Ibrahim *et al.,* 2011). This degradation started with increase in human population whose activities led to a decline in fish stocks (Sagir 2008; Tafida *et al.,* 2011).

Rural communities in Nigeria have suffered some neglect in terms of development over years, Bakolori fishing communities whose livelihood depend partly on fisheries resources which are fast depleting, are not exception. According to Balorunduro (2003) some combinations of factors such as formulation of a faulty agricultural policies, institutional frameworks, and unfavorable socioeconomic conditions are responsible for low fishing outputs. An understanding of the socioeconomic characteristics of the artisanal fishermen is of paramount importance for profitable capture fishery production (Akpoko, 2003; Oparinde *et al*., 2014).

Many policies and programs put forward by the government in order to improve the production potentials of the artisanal fishermen in Nigeria proved ineffective on account of poor understanding of the socioeconomic characteristics of the fishermen, including the nature of women's involvement in fishing activities (Balorunduro, 2003; Festus and Chidebulu, 2010; Isaac, 2013; Okey, 2013). The historical deprivation of women socially, politically, legally, and technologically aggravate their position and they are subordinated as production unit for bearing and rearing children (Ahmed, 2001).Women constitute about 51% of Nigerian population, but has low social status compared to their male counterpart, (CSTM, 2005). Their participation in fishing activities if any was minimal and not known properly with the exception of few works such as those of Akpoko (2003), Ibrahim *et al.* (2011), Olapade (2012), Nwabeze *et al.* (2013) and Oparinde *et al.* (2014).

Adoption of new fishing technology and information by the fishermen for improved productivity depend on some socioeconomic variables such as sex, age, educational status, household type, membership of a cooperative society and access to resources (Bolorunduro, 2003; Isaac, 2013). For example many of the rural artisanal fisher folks are low in literacy level and this resulted to different innovations adoption rates (Grace 1997; Akpoko, 2003; Vrajlal, 2004; Festus and Chidebulu, 2010; Ibrahim *et al.,* 2011). This study therefore was undertake to establish the socioeconomic characteristics of the fishermen of Bakolori reservoir in Zamfara State of Nigeria to provide the much needed base-line information which could be used to set priorities for future fisheries planning and research in the reservoir.

MATERIALS AND METHODS

Study Area

Bakolori reservoir is on an elevation of 333m above sea level (Google earth, 2011) on coordinate 12^0 $30^{'}$ 43" N and 6^0 11' 0" E, (Wikipedia, 2014). The reservoir lies within the Sokoto River basin (Ita, 1993b). The area is characterized by low rainfall pattern, between 550 and 1000mm per annum, and a temperature range of between 25^0C and 35^0C (Chaudhary, 1986: Ita, 1993b). The area has low relative humidity between 20% and 40% and the dry harmatan wind prevails between November and March (Ita, 1993b).

The vegetation of the area is that of Northern Sudan Savannah, characterized by scanty trees and grassland (Ita, 1993b). The hydrology of the reservoir is closely related with the rainfall pattern of the Sudan Savannah, and is fed by River Sokoto and many other smaller rivers and their tributaries (Ita, 1993a; Anonymous, 2011). The reservoir comes under the administrative boundary of Talata Mafara Local Government Area of Zamfara State in the Northwestern Nigeria.

Sampling Method and Sample Size

The sampling procedures selected were both purposive and random sampling methods. Ten major fishing villages were selected purposively and 10 respondents were randomly selected in each village. A total of 100 respondents were interviewed. The villages were chosen because of their high fishing activities, and comprised of Gidan Kano, Bakolori, Dosara, Dumamau, Banden kade, Kuka mai raffu, Tudun doki, Sado, Gidan Barebari and Maradun all in Maradun Local Government of Zamfara State.

Socio-economic Characteristics

Data collected on socio-economic characteristics of the fishermen included; Socio-demographic data such as status in the community, village, sex, religion, education and age. Other data included marital status, numbers of wives, children, other dependants, and children's enrolment in school. On the economic aspect, data collected included years of fishing experience, other occupations, source of labour, processing data, costs and revenue components of fishing activities.

Data Analysis

The data obtained were subjected to frequency distribution and percentage descriptive statistics (Stead and Tone, 1980) analysis using SPSS computer software, application version 16.0.

RESULTS

Socio-demographic Profile of the Fishermen

The results (Table 1) on the socio-economic characteristics of the fishermen revealed that 73% were ordinary fishermen while 6% were traditional title holders. All the fishermen interviewed from the 10 fishing villages were males, Muslims and Hausa by

tribe. About 55% were youths of the age bracket 19-40 years old while 5% were old men of 65-85 years. The literacy status of the fishermen revealed that only 26% of them went to primary school and 8% had secondary school education.

Among the fishermen interviewed, 98% were married and majority (87%) had 1-2 wives. The fishermen having 1-5 children were more (38%) while 6% had no child. In terms of number of other dependants, 41% had 1-5 dependants. Most of the fishermen had their children helping them in the fishing activities, 70% had 1-10 fishing assistants while 3% had up to 11-20 assistants. In terms of school enrollment, 34% of them had no children in schools while 60% had 1-8 children in schools.

Livelihood of the Fishermen

Table 2 shows that majority of the fishermen (97%) engaged in fishing as major occupation. However, majority (78%) were also involved in farming while others engaged in other economic activities such as livestock rearing and trading. In terms of years of fishing experience, 30% claimed to have being fishing on the reservoir for the past 30-40 years while 70% had 2 to 29 years of fishing experience on the reservoir. Majority (52%) of the fishermen also fished in other water bodies as migratory fishermen while 42% restricted their fishing to only Bakolori reservoir. The fishermen indicated three sources of finance, 95% depended on their personal savings from other economic enterprises while only 16% obtained credit facilities. The credit facilities were in different forms, 16% of the fishermen obtained cash while 10% received fishing inputs

The selling price (Table 3) of fish differed from time to time; 76% of the fishermen sold their fish between 100 and 300 naira/kg. The fish was sold in fresh form as indicated by 93% of them while others also sold in processed form. Revenue generated varied from season to season, 68% of the fishermen earned from 11,000 to 19,000 naira per week during flood season of August and September while 78% only caught fish for home consumption but earned up to 5,000 naira during mid-dry season months of February to April.

Table 1: Demographic status of the fishermen of Bakolori Reservoir

Variable*	Percentage	Variable*	Percentage
Status		No. of children	
Traditional title holder	6	0	6
Sarkin ruwa	13	1-5	38
Chairman of fishing cooperative	8	6-11	35
Ordinary fishermen	73	>11	21
		No. of other dependents	
Tribe		0	50
Hausa	100	1-5	41
Sex		6-11	9
Male	100	12-15	0
Religion		16-20	0
Islam	100		
Age		No. of children assisting in fishing activities	
19-40	55	0	27
41-64	40	1-10	70
65-85	5	11-20	3
Educational status		No. of children in school	
Quranic	66	0	34
Primary school	26	1-8	60
Secondary school	8	9-16	6
Marital status		17-20	0
Married	98		
Singled	2		
No. of wives			
1-2	87		
3-4	13		

Source: Field Survey, July, 2012,*number and frequency are the same (100) for each variable

Table 2: Livelihood and economic activities of the fishermen of Bakolori Reservoir

Variable	No. of fishermen	Percentage
Category of the fishermen		
Full Time/Major Occupation	97	97
Part Time/Minor Occupation	3	3
Years of fishing experience of the fishermen		
2-15	35	35
16-29	35	35
30-40	30	30
Years of fishing experience in other water bodies		
0	42	42
1-12	52	52
13-23	6	6
Other economic activities*		
Farming	78	78
Livestock rearing	41	41
Trading	7	7
Others (artisans, transportation et cetera)	2	2
Average fish selling price (Naira/kg)*		
100-300	76	76
301-600	35	35
Form in which fish is sold*		
Fresh	93	93
Processed	31	31
Revenue range (Naira/week)*		
Early rainfall(May/Jun) 7000-11,000	60	60
Flood season (Aug/Sep) 11000-19,000	68	68
Early dry season (Oct/Nov) 0-8,000	87	87
Mid dry season (Dec/Jan) 0-5,000	78	78
Late dry season (Feb/Apr) 0-6,000	77	77
Source of finance*		
Bank loan	16	16
Money lenders	10	10
Personal saving	95	95
Form of credit facilities*		
Cash	16	16
Fishing inputs	10	10
Smoking kilns	4	4
No access to credit facilities	84	84

Source: Field Survey July, 2012, Note:*Number and percentage not equal to 100 each due to multiple-response

Table 3: Revenue earned by the fishermen of Bakolori Reservoir

Variable	No. of fishermen	Percentage
Form for which fish is sold*		
Fresh	93	93
Processed	46	46
Bases for selling prices*		
Size/weight	54	54
Species	71	71
Freshness	19	19
Revenue ('000'naira/week)		
Early rainfall (May/Jun)		
1-6	33	33
7-11	60	60
12-16	7	7
Flood season (Aug/Sep)		
1-10	28	28
11-19	68	68
20-28	4	4
Early dry season (Oct/Nov)		
0-8	87	87
9-16	9	9
17-24	4	4
Mid-dry season (Dec/Jan)		
0-5	78	78
6-10	21	21
11-15	1	1
Late dry season (Feb/Apr)		
0-6	77	77
7-10	17	17
11-15	6	6

Source: Field survey, July, 2012.Key:*number and percentage is not equal due to multiple-responses.

DISCUSSION

The demographic characteristics of the fishermen of Bakolori reservoir (Table 1) like other small scale fishermen in Nigeria and Africa belong to a group called artisanal fishermen. They used simple fishing gears and equipment and catches small quantities of fish. Similarly, Tafida *et al.* (2011) have identified the fishermen of Kainji Lake as belonging to this category of fishermen, just as those of the arid zone of Katsina State (Akpoko, 2003).

The fishermen are Muslims because Zamfara State is largely Muslims dominated state and their religion does not prohibit the fishing profession. Although, this study discovered that some of the fishermen of Bakolori reservoir were not fishing on Saturdays on account of a taboo. Aida *et al.* (1985), Sunimal *et al* (1985) and Hemamala (1985) made

similar observation concerning Muslims participation in fishing activities in Philippines and the impact of Buddhism on fishing entry by small scale fishermen in Sri Lanka.

The fishing activities at Bakolori reservoir were also dominated by males because of religious, socio-cultural, political and capability limitations (Table 1) to women involvement. Similar observations were reported by Akpoko (2003) on women participation in fishing activities in arid zone of Katsina, Ahmed (2001) in Bangladesh and CSTM (2005) on the social status of women in Nigeria. On the other hand, Ibrahim *et al.* (2011) reported a large number of women in fish processing business in Lake Feferuwa fishing communities in Nasarawa State and Olapade (2012) reported also that women plays significant role in artisanal fishing in Asejire dam in Oyo State. Nwabeze *et al.* (2013) similarly reported that women were involved in all aspect of fisheries in Lake Kainji

The age class of the fishermen suggests that the youths of between 19 and 40 years old comprised 55% of the fishermen of Bakolori reservoir. This could be due to several factors such as low illiteracy level and lack of alternative jobs. This observation was also reported by Richard and Balirwa (2004) in Uganda. However, Olapade (2012) reported fishing business as very profitable and that even women participated in Asejire dam fishing communities in Oyo State. Oparinde (2014) also indicated that fishing business as viable among the artisanal fishermen in Ondo State and the reason why many youths participate in fishing in the area.

At Bakolori reservoir, the fishermen literacy level was low, only 26% and 8% had primary and secondary education. This was probably because the State is considered educationally dis-advantageous, and for a long time the attitude of the people to western education was not encouraging. Low literacy level was also bee reported among the fishermen in Katsina (Akpoko, 2003), Niger State, Bolorunduro, (2003), among fish producers in Asejire (Olapade, 2012) and rural communities in the South western Nigeria (Isaac, 2013). The children school enrolment was fair (66%) compared to the parents' literacy levels. Grace (1997) reported very low school enrolment of the children of migratory fishermen in Nigeria.

The findings that almost all the fishermen (98%) were married with majority (87%) having one or two wives revealed that the fishermen practice polygamy and they also have many children and other dependants. These did not only demonstrate the communities the fishermen belong, but also indicate better welfare than many low income rural farming communities. Similar findings were reported by Bolorunduro (2011) among the fishermen of Niger State.

Majority (97%) of the fishermen engaged in fishing as major occupation and at the same time involved in some economic activities such as arable farming, livestock rearing, trading and artisanship (Table 2). This could be due to lack of appreciable catches year round to sustain their livelihood or enterprise diversification strategy in order to earn more income. This finding was reported by Tafida *et al.* (2011), the authors recommended enterprise diversification by the fishermen of Kainji Lake Basin rather than depending on fishing alone.

The fishermen of Bakolori reservoir sell their catches mostly in fresh form; only few of them were involved in processing of excess catches. The main basis for fixing price was not by weighting but also based on fish species and individual size. Neiland (1997) reported similar finding on the fishing business in Lake Chad where the fishermen sold their catches fresh to whole sale fish mongers who in turn sell to their customers from different parts of the country. Sagir (2008) also reported similar finding concerning the fishermen sales of

their catches fresh and on the basis of the so called black and white fish species among the fishermen of Bangladesh.

The average revenue (Tables 2 and 3) per week earned by the majority of the fishermen of Bakolori reservoir was higher during flood season which corresponded with August and September, while least revenues were earned during mid-dry season of December to January. High revenue earned during flood season could probably be due to high fishing activities associated with the season and increased fish catches in the flooded low land areas and the lake tributaries. De Graaf (2003) observed similar finding on the dynamics of flood plain fisheries in Bangladesh which indicated that more fish were caught during flood season than any other season, while less fish were caught when water receded from the flood plains. Sagir (2008) also reported very good catches and high revenues during flood season than low floods in Brahmanbaria floodplains in Bangladesh. However, low fishing activities during mid-dry season could translate to low revenue earning for the fishermen. Many of the fishermen were not fishing during hamatan, which corresponds with December and January, due to high prevailing dusty winds and very cold water temperatures, therefore reducing the revenue generation of the fishermen.

On the financing of fishing activities, the study found out that majority of the fishermen relied on their personal savings earned from farming and other economic enterprises while only few had obtained banks loans. The fishermen were reluctant to obtain bank loans even from Bank of Agriculture due to ignorance and lack of necessary information. However, few of the fishermen who had access to credit facilities obtained cash, fishing inputs or processing smoking kilns. Vrajlal (2004) reported low credits accessibility among the fishermen of India because of their low literacy level. Ibrahim *et al.* (2011) observed that women accessed more production resources than capital or extension services in Lake Feferuwa fishing community of Nasarawa State. Festus and Chidebulu (2010) also revealed that on account of lack of western education among many cooperative members in Nigeria affected the ease of accessing intervention fund in Nigerian Agricultural, Cooperatives and Rural Development Banks.

CONCLUSION

From the results of this study it can be deduced that the socio-economic characteristics of Bakolori fishermen are similar with other artisanal fishermen in the country and in many other parts of the world. Therefore, this study established a base-line of information with a number of key policy issues emerging for future fisheries planning and research on the reservoir. There is the need for development policy or program aimed at managing the fisheries through enhanced education and diversification of income. More job opportunities could be created by the relevant Government agencies or cooperative societies in order to reduce the fishermen's over dependence on fishing.

Fish preservation and processing equipment could be made available to the fishermen and women processors so as to engage the people in value addition to fish production rather than selling off the little extra at cheap rates to fish mongers. They should be encouraged to form cooperative societies for ease of education and extension services, fishing inputs acquisition. Government policy or program aimed at managing the fisheries of the reservoir need to take into account the basic socioeconomic characteristics of the fishermen for it to be successful.

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<div align="center">REFERENCES</div>

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