
Socio-Economic Survey of Artisanal Fisher Folks in Three Selected Areas along River Kaduna

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Abstract

The present study surveyed the socio-economic status of some selected sixty (60) artisanal fishermen from Guza, Ungwan mu'azu and Gamji portions of River Kaduna with the objective to examine the state of indigenous (artisanal) fisheries sector in Kaduna state and to determine ways of developing it. The fishermen were selected randomly and data was obtained by survey methods and analyzed using descriptive statistics including frequencies and percentage. The study showed that output of artisanal fishing is positively associated with labour, capital, operation costs, fishing experience and educational level. Majority of the active fishermen fall in the 40-49 years age group, which represents 43.3% while 50% of the fishermen have a fishing experience of more than 15 years, with 67% having Quranic and Primary education. Male fishermen represents 88.3% and fishermen who operate on a full time basis are 65%. The fishing methods/gears utilized are cast nets, hook and line and trap (35%), while canoe and gourd as craft (36%). High fishing catch period is represented by 58.3%, while 38.3% represents period with bigger sized fish. There are no restricted fishing area or zone and no prohibition to size of fish

captured. The common fish species captured are Hetrobranchus bidorsalis, Clarias gariepinus, Gymnarchus niloticus, Auchenoglarres occidentalis, Tilapia faciatus, Hemichromis faciatus, Hyperopsis bebe. The study reveals the poor state of the fisher folk with little or no formal education and non-governmental participation to help strategise the capture fisheries for meaningful productivity.

Introduction

Fisheries are without doubt significant natural resources, particularly for parts of Africa and in particular Nigeria. These areas that rely heavily on fisheries for food security are places where the population is growing exponentially, meaning there are even more mouths to feed. (Global Aquaculture Alliance, 2019). Nigeria is blessed with a vast expanse of inland freshwater, marine, brackish ecosystem and very rich in aquatic life. Nigeria has a land area of 923,768km² with a continental shelf area of 47,934km² and a length of Coastline of 853km. it also has a network of inland waters lake rivers, flood plains, natural and manmade lakes and reservoirs (Shimary, 2005). The inland water mass was estimated to be about 12.5million hectares of waters capable of producing 512,000metric tons of fish annually (Shimary, 2005).. The artisanal fishery covers the operations of small-scale canoes fisheries operating in the coastal areas, creek, lagoons, inshore water and the inland rivers. The artisanal fishery is characterized by low capital outlay, low operational costs, low technology application and its labour intensive (Adedokun *et al.*, 2006). The bulk of fishery activities in Africa and particularly Nigeria are carried out by small-scale fish farmers, perhaps this made the subsector account for an average 4.87% of the Gross domestic product (GDP) before the year 2000-2004 (CBN, 2004). According to Hundeyin Christopher (2011) research on the socio-economic analysis of small scale fish farming enterprise in Lagos state, reveals that majority of the fish farmer in Lagos fish farming estate, were male and most of the farmers age range was equal within the economic active range, which favoured fish farming development.

Kaduna in the native dialect hausa, 'kada' is the word for crocodiles, "river Kaduna starts in Plateau State on the Jos Plateau 29 kilometers (18miles) Southwest of Jos town, flows through Kaduna State and through its capital Kaduna, and meets the Niger River in Niger State. Most of its course passes through open savanna woodland, but its lower section has cut several gorges above its entrance into the extensive Nigeria flood plains.

The study areas serve as source of water for domestic uses, fishery recreational activities and agricultural irrigation programs for people sitting close to the water body.

This study aimed to investigate the socio-economic characteristics of the fisher folks, to access the species of fish commonly caught and the fishing gears and craft used, with specific objectives of examining the state of indigenous (artisanal) fisheries sector in Kaduna state.

MATERIALS AND METHODS

STUDY AREAS

River Guza and Gamji River are located at Kaduna North Local Government experiencing typical climate with two distinct seasons. The wet or rainy season and dry season, the rainy season last from April to October with annual rainfall in the range of 1500-2000m while River Unguwan Mu'azu is located at Kaduna South Local Government Area with also two distinct season. The rainy season which last from March to November with annual rainfall in the range of 1550-2100m. And the dry season usually shorter than that of the other two Rivers (River Guza and River (Gamji). During the rainy season, the daily mean temperature is 25⁰C while in the hot season the average temperature is 32⁰C (Ekpebu, 2001). The people living surrounding this area are predominantly farmers and fishers and are mostly Hausa tribe.

All the rivers are tributaries of River Kaduna, River Kaduna is a tributary of the Niger River at (Lat 8⁰ – 7609⁰N and Lat 5,999⁰c) which flows for 550 kilometers (340miles) through Nigeria.

Sampling Procedure and data collection

The data for this study were collected through the use of questionnaire and unstructural interviews. A structured questionnaire was used to obtain information from sixty (60) artisanal fishermen who were drawn from the

three (3) selected important fishing zone (Gamji River, Guza River and Unguwan Mu'azu River) along River Kaduna. The unstructured interviews were made to extract information from the heads of each of these zones.

Data Analysis

Simple descriptive statistics including frequency and percentage were used for the analysis.

Analysis was done using Spss computer software, application version 16.0. The results were summarized in table forms for further interpretation and presentation.

RESULTS

Sex of the Fisherman

The frequency distribution of respondents (fishermen) according to sex is shown in table 1. The sex of the respondents shows that majority (88.3%) of the fishermen were male while the remaining 11.7% were female.

Marital Status

Table 1 shows that majority (85%) of the fishermen were married while the remaining 15% were not married (single). This may be associated with the age limit of the fishermen.

Age Limit

The frequency distribution according to age is shown in table 1. The distribution of the respondents showed that most of the fishermen fall between 40-49 years of age. This group accounted for 43.3% of the total respondents. This was followed by the age group of between 29 and 39 with 26.7% of the total respondents. This was further followed by the age group of more than fifty (50) years with 18.3% of total respondents. The least in the age distribution structure is the age of between 1-28 with 11.7%. This result implies that fishing activities are dominated by people in the average active age brackets.

Educational Level

As shown in Table 1. Majority (31.7%) have Quranic Education only, 30% have secondary education or have spent between 7 to 12 years in school. 13.3% have bible and primary school only and the least (6.7%) have Quranic

and primary education only. This result pointed out that all the fishers (respondent) have no tertiary educational level.

Family Size

Family size of the fishermen in table 1 was classified into three (3) as follows 1-5 members (13.3%), 5-10 (53.3%), and above 10 members (33.3%). This result implies that majority (53.3%) of the fishermen have family members between 5-10 while those with least (13.3%) family members have between 1 to 5 members.

Mode of Operation

As shown in table 1. Majority (65%) of the fishermen engaged in their full-time activities while the remaining 35% engaged in their part-time activities. This 35% may engaged in other non-fishing activities.

Fishing Experience

As shown in table 1. The number of years of the respondents have been engaged in fishing reveals that majority 50% has more than 15years of experience. 23.3% have experience between 11-15years in fishing. 20% have experience between 5-10years while the least 6.7% with fishing experience have less than 5years.

Seasonal Fishing Activities of the Fishermen of River Guza, River Gamji and River Unguwan Mu'azu

Table 2 shows the year round on the fishing activities of the fishermen. A good number of fishermen 58.3% indicated high fishing catch period during early rainfall in May/June, 15% during flood season (August/September) and early dry season (October/November). While the least period with high fishing catch is late dry season in February/January as indicated by 5%. 38.3% indicated period with bigger sized fish during early rainfall in May/June, followed by 25% during flood season (August/September), then 23.3% during early dry season, while the least is 6.7% during mid-dry season and late dry season. 100% of the fishermen indicated that, there is no restricted fishing area, no restricted fishing zone and no specific size of fish for them to catch. Also 100% of the fishermen indicated fish species commonly captured as

Heterobranchus bidorsalis, *Clarias gariepinus*, *Gymnarchus niloticus*, *Aucheroglamis occidentalis*, *Tilapia fasciatus* and 26 others. The species absent are *Hemichromis fasciatus*, *Heperopsis bebe occidentalis*.

Types of Fishing Gear Employed

Table 3, shows the arrays of fishing gears and craft used by the fishermen of River Guza, River Gamji, and River Unguwan Mu'azu. Majority thirty five (35%) of the fishermen used Hook and Line, cast nets and trap only. 20% used trap only and castnetss only, 5% used Hook and line only and 5% Basket net only. This result indicates that Hook and line and Basket net only was the least gears used.

Table 1:Frequency distribution of respondents by selected socio-economic characteristics

SOCIO-ECONOMIC CHARACTERISTICS	NO. OF FISHERMEN (RESPONDENTS)	PERCENTAGE (%)	CUMULATIVE PERCENTAGE (%)
SEX			
MALE	53	88.3	88.3
FEMALE	7	11.7	100
TOTAL	60	100	
MARITAL STATUS			
MARRIED	51	85	85
SINGLE	9	15	100
TOTAL	60	100	
AGE LIMIT			
1-29	7	11.7	11.7
29-39	16	26.7	38.4
40-49	26	43.3	82.1
>50	11	18.3	100
TOTAL	60	100	
EDUCATIONAL LEVEL			
PRIMARY	18	30	30
SECONDARY	11	18.3	40.3
QURANIC ONLY	19	31.7	80.0
	4	6.7	86.0

QURNIC AND PRIMARY ONLY	8	13.3	100
BIBLE AND PRIMARY ONLY			
TOTAL	60	100	
FAMILY SIZE			
1-5	8	13.3	13.3
5-10	32	53.3	66.6
>10	20	33.3	100
TOTAL	60	100	
YEARS OF EXPERIENCE			
<5YEARS	4	6.7	6.7
5-10	12	20	26.7
11-15	14	23.3	50
>15	30	50	100
TOTAL	60	100	
MODE OF OPERATION			
FULL-TIME	39	65	65
PART-TIME	21	35	100
TOTAL	60	100	

Table 2: Seasonal fishing activities of the fishermen of River Guza, RiverGamji and River Ungwan Mua'zu

VARIABLE	NO. OF FISHERMEN	PERCENTAGE (%)
HIGH FISHING CATCH PERIOD		
EARLY RAINFALL (MAY/JUNE)	35	58.3
FLOOD SEASON (AUGUST/SEP)	9	15
EARLY DRY SEASON (OCT/NOV)	9	15
MID DRY SEASON (DEC/JAN)	4	6.7
LATE DRY SEASON (FEB/APR)	3	5
PERIOD WITH BIGGER SIZE FISH		
EARLY RAINFALL	23	38.33
FLOOD SEASON	15	25
EARLY DRY SEASON	14	23.3
MID DRY SEASON	4	6.7
LATE DRY SEASON	4	6.7

PERIOD WITH SMALL SIZE FISH		
EARLY RAINFALL	10	16.7
FLOOD SEASON	11	18.3
EARLY DRY SEASON	9	15
MID DRY SEASON	9	15
LATE DRY SEASON	21	35
PROHIBITED SIZE OF FISH TO CATCH		
NONE	60	100
RESTRICTED FISHING AREA		
NONE	60	100
FISH COMMONLY CAPTURED		
<i>HETROBRANCHUS BIDORSALIS</i>		
<i>CLARIAS GARIEPINUS</i>		
<i>GYMNARCHUS NILOTICUS</i>		
<i>CLARIAS ANGUILLARIS</i>		
<i>AUCHEROGLANIS OCCIDENTALIS</i>		
<i>TILAPIA MELANOPLEURA</i>		
SPECIES ABSENT		
<i>HYPEROPSIS BEBE OCCIDENTALIS</i>		
<i>HEMICHROMIS FASCIATUS</i>		

Table 3: Distribution of Respondents by Fishing Practice used

VARIABLE	NO. OF FISHERMEN	PERCENTAGE (%)	CUMULATIVE PERCENTAGE (%)
FISHING GEARS			
HOOK AND LINE ONLY	3	5	5
CASTNET ONLY	11	18.3	23.3
TRAP ONLY	12	20	43.3
BASKET NET ONLY	3	5	48.3
HOOK AND LINE AND CASTNET ONLY	10	16.7	65
HOOK AND LINE, CASTNET AND TRAP ONLY	21	35	100
TOTAL	60	100	
FISHING CRAFT			
CANOE ONLY	9	15	15

ENGINE BOAT ONLY	-	-	-
GOURD ONLY	15	25	40
CANOE AND GOURD ONLY	36	60	100
TOTAL	60	100	

DISCUSSION

The descriptive analysis of socio-economic characteristics of respondents in the study area in Table 1 shows that age is an important socio-economic characteristics because it affects productivity, output and efficiency. It was observed that majority 43.3% of the respondent of these three (3) studied area (River Guza, River Gamji and River Unguwan Mu'azu) ages between 40 to 49. This implies that most people engaged in fish catching were still active and physically fit to paddle the canoes. The implication is that the respondents are within the productive and economic active age, and could be able to increase fish catch and improve livelihood of the families. The finding was in agreement with those of Dasuki (2014). The result further revealed that artisanal fishing is male dominated as shown in the table. Although the results showed the dominance of the artisanal fisheries sector by men, the contribution of women folk in active fishing cannot be undermined. According to Williams (2006), women still use traps and nets to catch fish in most fishing communities in Nigeria. The result showed a marital dominated vocation of the business. Table 1 reveals that majority 85% of the respondents were married. This might corroborate the stand that the marriage institution is still cherished and an indication of economic responsibilities of the respondents in caring for their dependents.

Education plays important role in technology adoption. Results showed that all the fishermen have a form of educational exposure, being it Quranic, Primary, Secondary and or Bible education. This result substantiated the findings of Oladoja and Adeokun (2009).

A relatively large household/family size was found in the study with 5-10 members having 53.3%. The finding supports the preponderance of large family size among the poor in rural areas as published by John (2013). However small-scale fishing is very labour intensive, requiring labour contribution from the fishers family, particularly in post-harvest activities. Because of these ancillary roles undertaken by women and other members of

the fisher's household, many fishers tend to have large families that can contribute positively to their livelihood.

Fishing Gear and Craft

The gear types found in this present study are castnet, hook and line (Longline), gill nets, Basket nets, and Traps (Malian or Gura trap). NIFFR, (2002) outlined similar types of gears during previous surveys of the inland water bodies in Nigeria. These gears are the commonest gear used in these areas (study area) and also commonest gear in Kainji Lake according to (Yisa *et al.*, 1995), Lake Alau (Bankole *et al.*, 2003) and Lake Chad basin (Bene and Neiland, 2003), all in Nigeria.

Hook and line, cast net, traps are the most used fishing gear among the fishers. As has been reported by Tagago *et al.*, (2011), different gears are used for targeting fish because of habitat changes. According to Bankole (2003), fishers used different kind of fishing gear because of seasonal variations in species availability. The present study gave static description of a fishery in the early rainfall, flood season, early dry season, mid dry season and late dry season, it is apparent from other publications that fishers measured seasonal variation and fish species as their main reasons for switching fishing gear Bankole *et al.*, (2003). The craft discovered during the study were locally made canoe made of wood planks and Gourd. As it is apparent in the literature (Udolisa *et al.*, 1994; Solariin, 1998; NIFFR, 2002). Greater number of Unguwan Mu'azu fishers own only one craft and this may be attributed to the level of commitment as many of the fishers have alternate means of livelihood. However, some fishers have two, three or more craft based on their financial status. The study shows that there is little or no diversity of craft use in the region. In previous studies, Ambrose *et al.*, (2001) identified three types of fishing craft in Nigerian Coastal Water namely: dugout, half-dugout and planked canoes. Ago and Tafida (2005), also identified dug-out type and gourd/calabash craft at the lower basin of Kainji lake.

Canoes in river normally have flat hulls or bottom while sea going vessels normally have pronounced keels, which are handy to avoid sideways drift but less operational in calm shallow waters.

According to Gilbert (2008), the sea going vessels have hulls that are long and slender with pointed ends.

The results of the present study also revealed that craft use by the fishers in River guza, River gamji and River Unguwan Mua'zu are mainly not motorized, probably because of their low cost compare to the motorized ones and also the present of stones as was observed. This was also reported by NIFFR, (2002) and Ago and Tafida, (2005) who identified the problem of not using motorized craft as a result of high price of outboard engines. Despite the cost, motorized craft facilitate fishers to reach far and deeper fishing area from the shore, and possibly other landing sites. Apart from simplicity of planked canoe, it is also durable and could last for more than 5 years if there is proper and adequate maintenance (Solarin, 1998).

Gear Types and Socio-economic Characteristics of Fishers

The relationship between gear types and socio-economic status of fishermen exists in this three study area. Fishermen that uses cast nets, hook and line and traps often had larger households/family size, they are married and at the same time older. Fishers households always have one or more contribution towards fishing activities. They normally play roles in the fishing operation, marketing of the fish, or sometimes both. Neiland *et al.*, (2000) reported that fishers households exhibited important variety in relation to their socio-cultural and economic features. The observed high percentage of married fishers in this present study reflects also the findings of Olaoye *et al.*, (2011) who affirmed that artisanal fisheries are dominated by married fishers. A possible reason may be linked to the fact that married people may have more pressing demands and problems to solve than singles or divorce (Kwen *et al.*, 2013) or that these are people that have managed to accumulate enough capital to both marry and purchase/inherit fishing gear and craft. The higher age group of fishers fell between 40-49 years, which may possibly indicates that youth are not fascinated by fisheries practice in these rivers or face increasing difficulties to enter the fishery. Much along the same lines, Ahmed (2012) reported age bracket of the fisher folk in Borgu local government area of Niger State, Nigeria to 30-49years.

Recommendation

Artisanal fisheries plays a very important role in the reduction of poverty, unemployment and protein malnutrition as well as considering the immense

benefits that can be derived from sustainable exploitation of the nations water bodies, the following recommendations after this study; are hereby stated;

- In order to increase the literacy level of these areas, policy makers should incorporate adult education for fishing communities of this study areas as it will boost fishery development therefore more people will be able to read fishery bulletins, read technical papers and extension guide effectively for sustainable exploitation of fishery resources, thus increasing production efficiency.
- Result from this study indicates that artisanal fishing is viable and profitable enterprise capable of providing employment opportunities in the rural communities, therefore, Government organs should provide more emphasis on ways to develop it and also ensure the effective management of the sector through adequate extension services, serious reorientation and training so as to meet the fish demand supply deficit. This will generate supplement income, diversification of livelihood activities and generation of employment opportunities as many people will engage in fulltime activities in these study areas and Nigeria at large.
- Fish supply in the area is seasonal, there is peak or high fishing catch period and low catch period, during the peak period, the prices for the commodity are very low and fluctuates regularly. The low catch period is associated with high prices of the commodity. In order to encourage fishermen to store their products with the view to increase their income by selling the produce of a later period at higher prices, modern and efficient post harvest storage facilities should be provided at fishing communities or major catching centres.
- Fishery extensions agents should advise fishermen to properly cost all the resource inputs used in the fishing activities including family labour with the view to genuinely assess the economic worth of fishing enterprises.

- Infrastructural facilities such as cold rooms should be provided by the government in fishing communities to reduce post harvest losses associated with artisanal fishing.
- Government should provide subsidy for fishing gears to cushion the effect of high cost of fishing crafts and gears as one of the factors militating against effective exploitation of fishing resources in the country.

Conclusion

The outcome of this study shows that fishers do not receive adequate extension service which should have exposed them to better fishing technique, government contribution will be needed through provision of extension services that will educate the fisherfolks on improved fishing gears and fishing practices as well as helping out by supplying gears and crafts that will help the fishing operations.

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