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The Socio-Economic Status of Artisanal Fishers in Cross River, Cross River State, Nigeria

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Abstract: The status of artisanal fishery in the Cross River State, Nigeria was studied between 2010 and 2011. Data related to socio-economic indices of the fisher-folks were obtained through structured questionnaire and in-depth guided interviews and were subjected to descriptive statistical analysis and the multiple regression analysis. The data analyses revealed that fishing was mostly the profession of the young persons and that the educational level of fisher folks was high in the area. The results reveal that almost average (91.7%) of the fisher-folks were males while 42.50% were in the active age distribution of 31- 40 years, no formal education (11.7%) while 25.0% are in the bracket of 11-15 year fishing experiences. Constraints faced by artisanal fisher folks includes high cost of netting and canoe, poor processing facilities, poor extension services to educate the farmers, poor weather condition, access road inaccessible credits and high cost of fishing inputs. If the fishery facilities of the area are improved upon it could support the strides towards employment generation, poverty alleviation and supply of animal protein to the teeming Nigerian population within the study area and beyond.

Key words: Artisanal Fisher % Socio-Economic % Households % Freshwater % Cross River State.

INTRODUCTION

Nigeria is blessed with over 14 million hectares of reservoirs, lake, ponds and major rivers capable of producing over 980,000 metric tons of fish annually according to FDF [1]. Statistical surveys have shown that the demand for fish in the country exceeds supply and also, the domestic production is still very low, considering the increasing human population. The annual fish consumption/demand in Nigeria has been estimated to be over 1.3 million metric tons and the total domestic production is just about 450,000 metric tons per annum, Tsadu *et al*. [2] and FAO [3]. Nigeria, like many other countries in sub-Saharan Africa, is endowed with substantial marine and inland fisheries resources, upon which the fisheries sector is based. However, since the 1980's, production trend in the sector has been very unstable particularly, in the coastal/brackish water artisanal sector which provides the bulk of the domestic production.

FAO [4] defined artisanal fisheries as traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries, e.g. from gleaning or a one-man canoe in poor developing countries, to more than 20 m. trawlers, seiners, or long-liners in developed ones. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export. They are sometimes referred to as small-scale fisheries".

Artisanal fisheries sometimes imply the use of family-labor and limited investments, although "artisanal fisheries" is generally taken to mean any non-industrial fisheries, some are almost semi-industrial. Artisanal or small-scale fisheries have been variously described in the literature. According to Mathew [5], 'traditional', 'small-scale' or 'artisanal' fisheries are used to characterize those fisheries that were

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mainly non-mechanized with low level of production. However, they are the predominant fishery in tropical developing countries Berkes *et al.* [6]. Artisanal fishing accounted for more than 80% of total fish production in Nigeria for twenty years from 1985-2005; while aquaculture accounted for less than 8% of the production and industrial fishing fluctuates with a pick of 13.9% and minimum of 5.0% for the period under review [7]. Artisanal fisheries sector made up the most important sector, which accounts for the major fish supply in the developing world.

According to FAO [8] assessment, out of 1.9 million people engaged in either full time, part time and seasonal fishing about 98% belongs to the artisanal sector. Artisanal fishery is however characterized with low technology, lack of modern equipments and low fund to expand, etc. resulting in labor intensiveness of the sector, with little or no opportunities to expand. These problems however forced the fishermen to seek for additional income in non fishing activities. Thus, fish being the cheapest source of animal protein to human, there is need to protect and manage the fishery in the reservoirs for the community. In order for this to be done effectively, detail knowledge of the artisanal fisheries of these reservoir is of great importance.

The capacity of artisanal fisheries to play its triple role of a food supplier, employment provider and income earner in the Nigerian economy depends on the adoption of appropriate management strategies that will ensure their sustainability in the face of intense fishing pressure. Even though artisanal fish production is the main stay of Nigerian domestic fishing industry, researchers have paid little attention to the experiences of the artisanal fishermen. This study was therefore articulated to investigate the socio-economics of artisanal fishers in Cross River State, Nigeria and to identify the problems encountered by the fisher folks and proffer solutions for improving the artisanal fishing enterprise. Furthermore, it will enable small-scale fishers make rational production decisions that will affect the profitability of their operations.

MATERIALS AND METHODS

Study Area: The study site is the Cross River. The Cross River is a coastal state in South Eastern Nigeria, named after the Cross River, which passes through the state. A floodplain river located at the south eastern part of Nigeria (Fig. 1) on Latitude 4°, 25´- 7°.00´N, Longitude 7°, 15´- 90.30´E. It is bounded in the south by the Atlantic

Fig. 1: Map of Cross River showing the study area

Ocean, East by the Republic of Cameroun, the Nigerian states of Benue in the North, Ebonyi and Abia in the West and Akwa Ibom; South West. Climate of the study area is defined by dry season and wet season. The wet season (April- October) is characterized by high precipitation (3050±230mm), while the dry season (November-March) is marked by low precipitation (300±23mm). Mean annual temperature ranged from 15.5±7.6°C (wet season) to 32.6±5.4°C (dry season).

Sampling Procedure: The study sampled 120 fishers made up of both men and women involved in artisanal fishing in Cross River State, Nigeria in the 2011season. The study purposively selected men and women who fish along the Cross River.

Method of Data Collection: Data for the study were collected through primary sources. In this method, questionnaire were designed with both opened and closed ended questions relevant to the objectives of the study and administered to 120 artisanal fishers in the study area. In the opened ended questions, the respondents were free to fill in the necessary answers as they feel whereas in the closed ended questions they were expected to choose from among the alternative questions provided.

Method of Data Analysis: The study used descriptive statistics, multiple regression analysis and the Likert scale technique to analyzed data collected. The descriptive analyses were used to describe the socio-economic characteristics of artisanal fishers in the area. The method was used to describe the variable of sex, age, marital status, family size, level of education and fishing experience using simple averages, frequency distribution and percentages.

The multiple regression analyses were used to determine effect of socio-economic status factors affecting the income of artisanal fishers in the area. Accordingly three functional forms of the models were used; these were the linear, the semi log and the double log functional forms. The model of best-fit was used (double log) as the lead equation (LE) to explain the variables in context. The three functional forms of the multiple regression analyses fitted includes

- Linear Function
  $Y = b_0 + b_1x_1 + b_2x_2 \ldots\ldots\ldots b_6x_6 + u$
- Semi - Log Function
  $Y = \text{Log}b_0 + b_1\log x_1 + b_2 \log x_2 + \ldots\ldots\ldots b_6\log_6 + u$
- The Cobb Douglas (Double Log) Function
  $\text{Log } Y = \text{Log } b_0 + b_1 \log x_1 + b_2 \log x_2 \ldots\ldots\ldots b_6 \log x_6 + u$

The implicit form of the model was specified as: -

$$Y = bo + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + u$$

Where

Y = Income (N)
x_1 = Gender (Number)
x_2 = Age (Years)
x_3 = Marital status (Number)
x_4 = Family Size (Number)
x_5 = Level of Education (Years)
x_6 = Fishing Experience (Years)
bo = Intercept
$b_1 - b_6$ = Coefficients of the parameter
u = Error term

Also the Likert scale with values of 4, 3, 2 and 1 was developed to determine constraints faced by artisanal fisher in the area. In this way the fishermen were asked to rate their constraint as “very critical” “critical” “to some extent critical” and not “critical”. The variable mean score of 2.5 was used to ascertain whether the factor in question was critical or not. The variables with mean score of 2.5 and above were considered critical while variable with less than 2.5 were not.

RESULT AND DISCUSSION

Table 1 and Figure 2-7 above describe the frequency distribution of the respondents based on the variable about the artisanal fishers in Cross River state Nigeria. These include sex, age, marital status, family size, level of education and fishing experience. From table 1, it showed that out of the one hundred and twenty (120) respondents, 110 were male while 10 were female giving 91.7% and 8.3% respectively, this finding reveal that fishing is not exclusively the right of the male in the area. It also revealed that 43 were between the age of 20-30 years, 51 were between the age of 31-40 years, 24 were between the age of 41-50 years, 2 were between 51-60 years, while nobody was 60years above giving 35.8%, 42.5%, 20%, 1.7% and 0% respectively, this also shows that fishing is carried out by adult who are within the ages of 20-50 years. The work of Udoh and Nyienakuma, [9] and Ita [10] agrees with the present work, they reports that 35.1% of the respondents fell between the ages of

Table 1: Demographic parameters of fisher folks in Cross River State

S/N	Variables	Frequency	Percentage
1	Sex		
	Male	110	91.7
	Female	10	8.3
	Total	120	100
2	Age		
	20 -30	43	35.80
	31 - 40	52	42.50
	41 - 50	24	20.00
	51 - 60	2	1.70
	60 - above	0	0.00
	Total	120	100
3	Marital Status		
	Married	78	65
	Single	37	30.8
	Divorced	5	4.2
	Total	120	100
4	Family Size		
	1 - 5	74	61.7
	6 - 10	40	33.3
	10 - above	6	5
	Total	120	100
5	Level of Education		
	Primary School	35	29.2
	Secondary School	52	43.3
	Tertiary Institution	19	15.8
	Never attended School	14	11.7
	Total	120	100
6	Fishing Experience		
	1 - 5	28	23.3
	6 - 10	56	46.7
	11 - 15	30	25.0
	20 - above	6	5
	Total	120	100

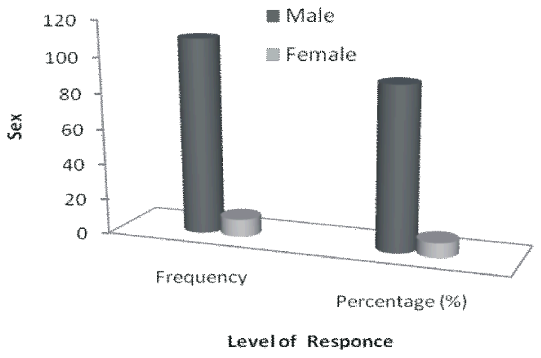

Fig. 2: Graph Showing Sex of Artisanal Fisher Folks and level of Occurrence in Cross River State

20-40, 62.2% fall within 41-50, while 2.7% of the respondents fall over 50 years of age. The fishers within the ages of 20-40 years of age were mature and able to withstand stress in fishing operations within the area.

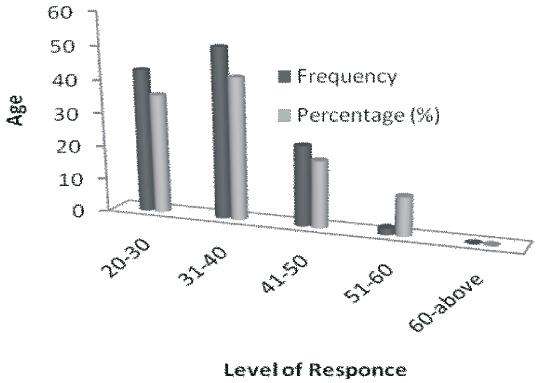

Fig. 3: Graph Showing Age of Artisanal Fisher Folks and level of Occurrence in Cross River State

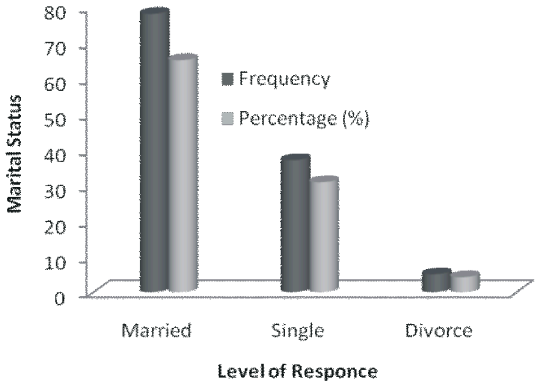

Fig. 4: Graph Showing Marital Status of Artisanal Fisher Folks and level of Occurrence in Cross River State

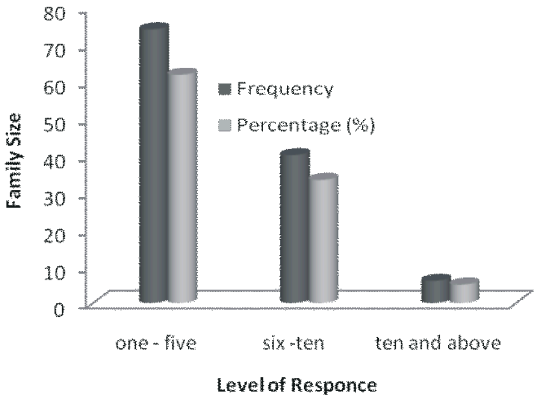

Fig. 5: Graph Showing Family Size of Artisanal Fisher Folks and level of Occurrence in Cross River State

Similarly, the household size of the fishers is also noted with a high dependency ratio. For instance, only 14.1% of the respondents had less than 5 members per household, while the modal group of 50.3% had between 6-10 members per household, 35.6% had 11 and above (Table 1). It is obvious that a large household size offers

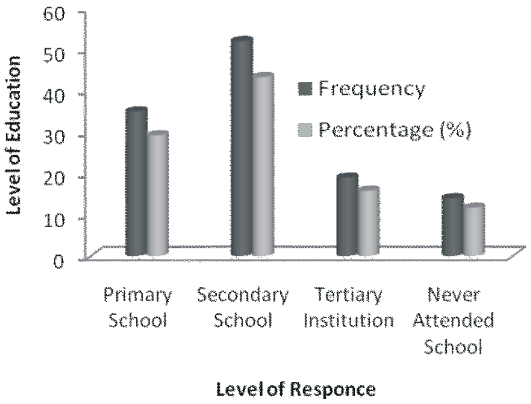

Fig. 6: Graph Showing Level of Education of Artisanal Fisher Folks and level of Occurrence in Cross River State

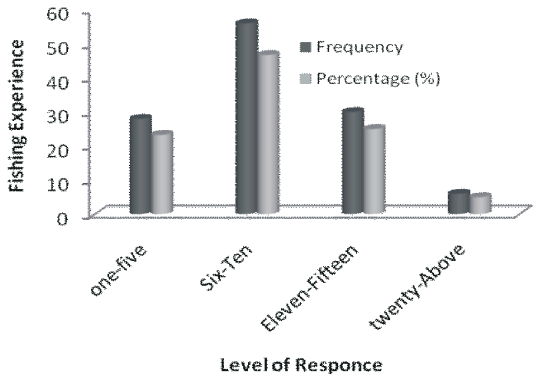

Fig. 7: Graph Showing Fishing Experience of Artisanal Fisher Folks and level of Occurrence in Cross River State

free and cheap labor for the fishing households. A 10.8% of the respondents had less than 5 years of experience in the fishing occupation followed by 24.3% of the respondents with 5 to 10 years, 21.6% with 11 to 14 years and 43.2% with 15 or more years of fishing experience. As a result, the respondents with the highest number of years of experience should have good skill and better approaches to fishing operations, Udoh and Nyienakuma, [9].

The table 1 also reveals that 78 of the fishers were married, 37 were single while 5 were divorced, giving 65%, 30.8% and 4.2% respectively. This indicates that the majority of the artisanal fishermen are married. The table showed that 74 had family size of 1-5, 40 had family size of 6-10 while 6 had family size of 10 and above which is represented by 29.2%, 43.3% and 5% respectively. On the level of education the table also showed that 35 had primary education, 52 had secondary education, 19 tertiary while 14 never attended school which is represented by 29.2%, 43.3%, 15.8% and 11.7% respectively. This implies that majority of the artisanal fishers had some form of education as about 88.3% of them could read and write.

This suggests that with proper extension services on the artisanal fishers they will gain more and better skills on fishing technologies. The table also reveal that 28 had fishing experience of 1 -5 years, 56 for 6-10 years, 30 for 11-15 years while 6 had fishing experience of 20 years and above which is represented 23.3%, 46.7%, 25.0% and 5% respectively. This finding indicate that young and more people are developing interest in the artisanal fishing industry as they exploit opportunities for daily livelihood and income.

The result of socio-economic status of artisanal fishers in Cross River State is shown on Table 2; three functional models (Linear, Semi Log and Double Log) were fitted to analyze the data collected. The results show that the Double Log function had the best fit and so was chosen as the lead equation (LE) to explain the variables. In this model (Double log) the coefficient of gender (x_1), Age (x_2) and Family Size all have negative signs and were not significant even at 10%. This indicates that these variables have negative impact on the status of the artisanal fishermen in Cross River state. This is so because, the larger the family size, most of the fish caught are used to feed the household, whereas as the fishermen grow older they become weaker and weaker to go into fishing along river to generate income.

The variable of marital status (x_3), is positive but not significant, this indicates that married couples assist themselves to raise income in the family. This is so because as the men catch fish, the women undertake the processing and sale of the fish and this influences the status of the fishers in Cross River State. The coefficient of fishing experience (x_6) was positive and significant at 5%. This indicates that this variable positively and significantly influences the income of the fishers in Cross River State. Also the variable of educational level (x_5) was found to be positive and significant at 10%. This shows that those who are educated are more tactical and innovative to carry out fishing in Cross River state, thereby generating more income to the household than those who are not educated.

The coefficient of these explanatory variables (gender, age, marital status, family size, level of education and fishing experience) had an R^2 value of 0.71 which shows that 71% of these variables influence the status fishermen in Cross River State. The F-Ratio was 1.273 and

Table 2: Multiple Regression Analysis on the Socio-Economic Status of Artisanal Fishers in Cross River State

Variables	Linear	Semi Log	Double Log
Constant	4188.653±0.335*	-11051.06±-0.226	9.568±10.146*
Gender (x_1)	1539.087±-232	-315.048±-0.196	-021±-674
Age (x_2)	235.159±0.783*	8109.913±0.591	-0.002±0.000
Marital Status (x_3)	341.609±0.086	455.764±0.062***	0.048±0.332
Family Size (x_4)	-988.719±-1.561	-8513.996±-1.488	-0.087±0.939
Level of Education (x_5)	378.701±0.976	3787.164±0.790	209±1.895***
Fishing Experience (x_6)	3009.367±1.233	6706.920±1.278	0.178±1.760**
R^2	0.54	0.53	0.71
RG^2	0.04	-0.3	1.273
F-Ratio	1.078	0.939	1.273**

* - significant P < 0.01, ** - significant P < 0.05, ***- significant P < 0.10,

Table 3: Constraints Faced by Artisanal Fishers during Fishing Activities in Cross River State

S/N	Constraints	Very Critical	Critical	To Some Extent Critical	Not Critical	Scores	Points	Remarks
1	High cost of fishing gears.	70	18	22	10	388	3.23	Critical
2	High cost of craft (Canoes)	60	40	15	7	393	3.28	Critical
3	Non Availability of baits	20	25	60	15	290	2.42	Not Critical
4	High cost of transportation	20	35	45	50	295	2.46	Not Critical
5	Poor access road to/for fishing ground	30	26	20	44	282	2.35	Not Critical
6	Lack of credit facility to purchase fishing inputs	56	46	15	04	393	3.28	Critical
7	Poor fish handling and processing equipment	50	34	26	10	364	3.03	Critical
8	Lack of storage facility (Cold room / refrigerators)	60	40	10	10	390	3.25	Critical
9	Poor market structures	17	23	40	40	257	2.14	Not Critical
10	Lack of extension services to educate fishers on new fishing activities	80	30	10	00	430	3.58	Critical
11	Excessive rainfall during raining season	37	32	27	24	322	2.68	Critical
12	Risk of canoes capsizing	20	29	49	22	287	2.39	Not Critical
13	Drying up of river during dry season	55	20	25	20	350	2.92	Critical

was also found to be significant which gives the overall significance of the variation in the status of the fishers in Cross River State as caused by socio economics factors.

The Likert scale technique was used to analyzed Table 3; it shows the response of artisanal fishermen on constrains faces in fishing activities in Cross River State. The table revealed that high cost of netting materials and other gears, high cost of canoes and fuel, lack of credit facilities from lending houses, poor processing equipments, lack of storage facilities, lack of extension services education, excessive rainfall during raining season and drying up of river during dry season were found to be very critical facing fisher in Cross River State. Whereas non availability of fishing baits, high cost of transportation, no access to fishing ground, lack of buyers and risk of canoes capsizing were found not to be very critical factors affecting their fishing operation in the study area.

No extension services, lack of credit facilities, high cost of canoes and lack of storage facility, were found to be the most critical factors as responded by the fishers in the area. These suggests that if government should give attention to the fishers by providing adequate extension services education and capital in form of credit facilities they will greatly improve on their fishing activities in the study area. This will improve on their nutritional value, raise income and socio-economic status of the fishermen in Cross River State.

CONCLUSION

In conclusion, findings in the study had indicated that artisanal fishing operation is one of the oldest businesses among the respondents in the study area. However, fishing operations among the artisanal fishing households are typically done by traditional means with primitive technologies and under diverse constraints. Major problems included inadequate storage facilities, lack of credit facilities scarcity of fuel, marketing problems and high cost of fishing materials among others. Provision of adequate extension services, education and credit facilities to fishers in area will help improve on their

fishing profession. This will raise income and alleviate poverty among the teeming youth who are involved in business.

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