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Effect of Socio-economic Factors on Fish Catch in Lower Ogun River, Isheri-olofin and Ihsasi, Ogun State, Nigeria

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Abstract

This study was undertaken to investigate the effect of socio-economic factors on fish catch around the Lower Ogun River in Isheri-Olofin area (downstream) and Ihsasi (upstream). Two hundred and fifty (250) respondents were randomly sampled. The data was analyzed using descriptive statistics and chi-square. It was found that a large percentage (74.4%) owned personal fishing craft. 18% of the respondents have not had any formal education, 38.4% had attended primary school, 42.4% had attended secondary school, and 1.2% had attended a tertiary institution. Majority (62%) of the respondents were married while 31.2 % were single. The result shows that 98.4% of the respondents constitutes male while the remaining 1.6% constitutes female. 70.4 % of the respondents fall within the age bracket of 15–40 years while the remaining 29.6 % are elderly with age range of 41-66 years. It was also discovered that there is a significance decline in the abundance of catch in the downstream compared to the upstream. There is significant difference between the two stations in all socioeconomic factors evaluated.

Keywords:

Socio-economic, Fish-catch, Ogun River.

INTRODUCTION

The challenge to increase protein consumption in Nigeria appears to be more urgent now than ever (Mbanasor, 2002). Poor people are facing new barriers in both their production and returns on fish. Even by the standards of developing countries, artisanal fishers and fish workers are often among the poorest people and they generally operate on a small scale and use traditional fishing practices yet new technologies and environment requirement favour large scale capital intensive operation at the expense of traditional and small scale commercial fishing (Delgado *et al.*, 2003).

In Nigeria there are more than 6 million coastal and riverine artisanal fisher folks fishing the 46,300 km² of maritime area and 125,470.82 km² of inland water bodies. They contribute 85% of domestic fish consumption in Nigerian (Fish for All Submit, 2005). About 300,000 coastal migrant fishermen, mostly Ghanaians, also depend on the fisheries resources as the main source of sustenance, assets and investment capital. Fishing supplies 75% of their animal protein intake, and more than 98% of the population of the fishing communities is dependent on fishing and fishery related activities (SFLP, 2002). There is an on-going quest for improved fishing techniques and gears to replace the low yielding traditional fishing methods. Fishermen are interested in new and improved fishing gears such as canoes, buoys, floats, nets, fish chemicals and mechanization with the use of an out-board engine (Watson *et al.*, 2006). The use of poor quality fishing materials limits the catch levels (Tietze *et al.*, 2005). Some of the synthetic nettings are, for instance, very expensive and poor in quality. Low tensile strength netting and slippage - prone single knots result in distorted or irregular mesh sizes especially in the gillnets. The dearth and high cost of fishing gear accessories are other problems and many fishermen often need to seek cheaper local options (AER, 2003). The buoyancy of the multi-various floats and the gravitational force of the cement sinkers are not quantified and the attitude of suspending the gear was more of the guess work than science, compromising on gear efficiency.

The Federal Bureau of Statistics FBS (1992) and Clark *et al.*, (2005) reported that non avail-

ability of credit scheme for small-scale capture fisheries militated against its capital-intensive expansion. Only a few financial institutions provide some credit without collateral for "small" loans. Small-scale fisheries are often considered too risky hence most banks do not include them in their credit loan scheme (Clark *et al.*, 2005).

Ogun state, being one of the eight coastal states in Nigeria has about 15 kilometers marine areas and numerous rivers, streams and inland waterways which support varied fishing activities (Adeokun *et al.*, 2006). The abject poverty of the fishermen also forced them to resort to illegal method of fishing with foul fishing gear which destroyed fish breeding grounds and afforded the harvest of immature fishes (Adeokun *et al.*, 2006).

Fish is a vital source of food for people. It is man's most important single source of high-quality protein, providing approximately 16% of the animal protein consumed by the world's population, according to (FAO, 1997). It is a particularly important protein source in regions where livestock is relatively scarce—fish supplies less than 10% of animal protein consumed in North America and Europe, but 17% in Africa, 26% in Asia and 22% in China (FAO, 2000). The FAO estimates that about one billion people worldwide rely on fish as their primary source of animal protein (FAO, 2000).

Fish also has substantial social and economic importance. The FAO estimates the value of fish traded internationally to be US\$ 51 billion per annum (FAO, 2000). Over 36 million people are employed directly through fishing and aquaculture (FAO, 2000), and as many as 200 million people derive direct and indirect income from fish (Garcia and Newton, 1997). Consumption of food fish is increasing, having risen from 40 million tonnes in 1970 to 86 million tonnes in 1998 (FAO, 2000), and is expected to reach 110 million tonnes by 2010 (FAO, 1999). Increases in per capita consumption account for only a small portion; it is the growing human population in many countries in Asia, Africa and South America that is primarily responsible for this steadily growing demand for food fish. These data illustrate that a consistent source of fish is essential for the nutritional and financial health of a large segment of the world's population.

Today, fish is the only important food source that is still primarily gathered from the wild rather than farmed—with marine capture historically accounting for greater than 80% of the world's fish supply. Total landings from marine fisheries increased approximately 5-fold in the 40-year period from 1950 to 1990 (Mace, 1997). More recently, however, capture fisheries have not been able to keep pace with growing demand, and many marine fisheries have already been over-fished. In the period 1990–1997, fish consumption increased by 31% while the supply from marine capture fisheries increased by only 9% (FAO, 1999). This has intensified the pressure on the harvesters, which has translated into increased pressures on, and over-fishing of, many commercial fisheries. Nearly half of the known ocean fisheries are completely exploited (FAO, 1999), and 70% are in need of urgent management (MacLennan, 1995).

The general trend in fish supply suggested that domestic production is not increasing at the same rate with yearly increase in demand. The annual demand for fish is 40, 1128 tones against the supply level of 10,561 metric tons (Adekoya and Olunuga, 1999). The contribution of artisanal fisheries is poor due to low output, poor processing mechanism, ineffective distribution and marketing of fishing products and post harvest loss (Adeokun *et al.*, 2006). Post harvest losses according to Akande (1996), is estimated to be at least 40% of the total landings. Opele (2002) found out that these losses occurred as a result of difficulties in fish sorting from artisanal fishing nets, limitations of processing equipment, absence of cold storage on small fishing craft and poor water transport system.

The objective of the study is to determine the socio economic characteristics that could affect fish catch in the study area. Some of the socio economic characteristics of respondents that have been examined include age, sex, marital status, location, educational background, major occupation, minor occupation and source of credit.

MATERIALS AND METHODS

The study was conducted in Ogun State of Nigeria. Ogun State is situated within the tropic

region and covers an area of about 16, 369, 37 square kilometers, and it occupies approximately 1.78% of the Country's total land area which is 923,778 square kilometers. It is one of the eight coastal (maritime states of the country, with a 15 kilometers coastline on its South-Eastern part in the Ogun water side Local Government Area. Ogun State is bordered on the South by Lagos State, on the East by Ondo State, in the North by Oyo and Osun States, and on the West by the Republic of Benin.

Essentially, the study was carried out in both Isheri-Olofin and Ishasi areas of lower course of Ogun River before its bifurcations into two tributaries. The entire study area lies between 30 16"E and 30 18"E Longitude, and Latitude of between 60 35"N and 60 38"N. The area is characterized by a typical rainforest climatic condition of rainy season from April to November and dry season from December through March. The dry season, which occurs between November and March of every year, is caused by a dry North-East trade wind coming from Sahara desert and causing harmattan. During these five months of dry season, the fishing operations are usually strenuous a bit due to the scorching of the Sun and the consequent drop in levels of water bodies. The rainy season is caused by the South-Western wind or the equatorial maritime air mass which brings warm and very moist air from the Atlantic Ocean.

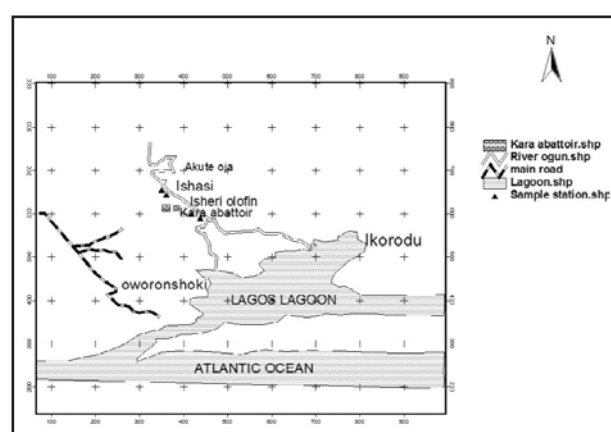


Figure 1: Map of Lower Ogun River

Artisanal fisheries are major activities in Lower Ogun River. At Isheri-Olofin, Lower Ogun River receives effluents from 'Kara' Abatior which was established in 1984.

Data collection

The data was collected through field survey. A questionnaire was designed to collect a comprehensive profile of socioeconomic conditions of the fisher folk and their fishing and marketing characteristics. Five villages were randomly selected using fifty questionnaire per village. Since most members of the fishing communities are illiterate, a personal interview was conducted. 250 structured questionnaires were designed in order to elicit information from the fishermen and administered to randomly selected respondents from Isheri and Ishasi locations.

The questionnaires are structured in such a way to consists of both open and close ended questions. The open ended questions allow the respondent to express their own opinions about specific situations in order to fulfill the specific objectives of the study. Data collected include socio economic characteristics of the fisher folks in terms of sex, age, level of education, marital status, number of wives and household size, type of primary and secondary occupations, membership of cooperative society. Their fishing characteristics which include; types of fishing craft and gears used, fishing duration, possession of outboard engine, type of fish harvested, reason for fishing, method of disposal of catch, years of fishing experience. Their marketing characteristics which include; peak marketing period, type of labour, method of sale, quantity of fish caught per day, average selling price of fish, average monthly income, method of fish preservation.

Data Analysis

The primary data collected from the field was meticulously entered into the computer for processing and tabulation. Data from the study were analyzed using the following analytical tools:

(a) Descriptive Analysis such as percentages, tables, graphs and bar charts.

(b) Chi-square (χ^2), which was used to test the parameters between the two stations.

RESULTS AND DISCUSSION

An average of 200 cows are slaughtered and butchered at the abattoir on daily basis. The effluents being discharged into the river chiefly contain the gut contents of the slaughtered and

butchered cows. Data for this study were obtained from both primary and secondary sources. Primary data sources were those collected from the fishermen while the secondary data were obtained from research reports and also from literatures and other publications of relevance.

The followings are names of some fish species caught by the respondents:

- 1 *Synodontis nigrita* (Okokoniko)
- 2 *Heterobranchus longifilis* (Aso)
- 3 *Citharinus citharus* (Osu)
- 4 *Clarias anguillaris* (Aro)
- 5 *Hemichromis bimachulatus* (Epia)
- 6 *Hepsetus odoe* (Ija)
- 7 *Hydrocynus forskalii* (Akoko)
- 8 *Tilapia zilli* (Epia)
- 9 *Marcusenius senegalensis* (Afintin)

A total of 250 respondents were involved in the study of Isheri-olofin (130), and Ishasi (120) around lower Ogun River. At the end of the data collection the socio-economic characteristics, fishing characteristics and marketing characteristics of the respondents were tabulated in order to see the relationship in terms of frequencies and percentages. Some of the data collected were also displayed in graphical forms. The results of each objective of the study are displayed and explanations given as appropriate.

Table 1 below summarizes the different ages of the respondents. It is observed that the fishing profession is practiced by fisherfolks of different ages. That is, it is not limited to fisherfolks of certain age range. However, the result in Table 6 shows that 70.4 % of the respondents falls within the age bracket of 15–40 years while the remaining 29.6 % are elderly with age range of 41-66 years. This shows that most of the people who get involved in fishing are youth because they have the ability and strength to endure the rigor that is involved in fishing more than the elderly fishermen. It can be concluded that most of the marketers are in their economic active years.

It is indicative of the position of Oladoja (2005) and Adeokun *et al.*, (2002) that many of the fisherfolks who remain in the profession are there because they have difficulty in starting another profession rather than out of sustained interest.

Also, it shows that 98.4% of the respondents constitutes male while the remaining 1.6% con-

Table 1: Distribution of respondents' socio-economic characteristics

Socio-economic characteristics		
	Frequency	Percentage
Gender		
Male	246	98.4
Female	4	1.6
Total	250	100
Age		
15 - 24	78	31.2
25 - 34	69	27.6
35 - 44	47	18.8
45 - 54	35	14
55 - 64	12	7.6
Above 64	2	0.8
Total	250	100
Educational background		
No formal education	45	18
Primary education	96	38.4
Secondary education	106	42.4
Tertiary education	3	1.2
Total	250	100
Marital status		
Single	78	31.2
Married	155	62
Divorced	9	3.6
Widowed	8	3.2
Total	250	100
Household size		
1 - 5	46	18.4
6 - 10	158	63.2
Above 10	46	18.4
Total	250	100
Religion		
Christianity	135	54
Islam	76	30.4
Traditional	39	15.6
Total	250	100
Tribe		
Yoruba	144	57.6
Egun	55	22
Hausa	26	10.4
Igbo	25	10
Total	250	100
Major occupation		
Fishing	133	53.2
Artisan	19	7.6
Trading	27	10.8
Butchery	39	15.6
Transportation	1	0.4
Cattle rearing	9	3.6
Schooling	22	8.8
Total	250	100
Minor occupation		
Trading	24	9.6
Artisan	14	5.6
Herbalist	1	0.4
Transportation	11	4.4
Cattle rearing	6	2.4
Butchery	16	6.4
Barbing	3	1.2
Labour work	8	3.2
Fishing	117	46.8
None	50	20
Total	250	100
Credit source		
Personal savings	231	92.4
Cooperative	19	7.6
Total	250	100
Infrastructure facilities		
Hospital	63	25.2
Schools	56	22.4
Mobile toilet	19	7.6
Water supply	59	23.6
Electricity	10	4
Telecommunication	6	2.4
Community bank	37	14.8
Total	250	100
Water source		
Well	75	30
Pipe-borne	148	59.2
River	27	10.8
Total	250	100

stitutes female. This shows that on the general, male are more involved in fishing activities in the study areas than their female counterparts. This implies that both male and female participate in fishing activities, males being dominant. Female are therefore not left out in fishing. This is further supported by Williams and Awoyomi (1998) who observed that women in small-scale riverine fishing villages also perform other types of income-earning activities to supplement the household income. Such income sources were earned through sales of fisheries products and social services in fish distribution and marketing.

The result in Table 1 also reveals that majority (62%) of the respondents were married while 31.2 % were single. 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 (Jibowu, 1992; Adeyemi *et al.*, 2002). The study also shows that very few (6.8%) of the respondents were either divorced or widowed. The result shows that more of the married men were involved in the fishing activities. This is justified by the fact that majority of the respondents have family members that they have to cater for, hence the more reason why they go into fishing.

The data in Table 1 illustrates that 18% of the respondents have not had any formal education, 38.4% had attended primary school, 42.4% had attended secondary school, and 1.2% had attended a tertiary institution. It can be concluded that most of the most of the respondents had secondary education, which is as a result of the presence of senior secondary schools in the study area. This finding substantiated the findings of Lawal and Idega (2004) who observed that the level of education attended by the respondents to a large extent determine the strategies which he/she may use to solve his/her marketing problems and to adopt new innovations without difficulties that will increase his profit as soon as they became available to him/her.

Table 1 shows the major occupation of the interviewed respondents. The study area is an area where there is diversification of trade just because of the presence of abattoir in the area. 53.2% of respondents are mainly into fishing,

8.8% are students which return to fishing after their school hours and during their holidays, 7.6% said fishing is a minor occupation while artisan is their major work, 10.8% said fishing was a minor occupation while trading was their major work, 15.6% said butchery was a major occupation, 0.4% said transporting was a major occupation, while 3.6% said cattle rearing was their major occupation. One can see from this result that the study areas are largely dominated by fisherfolks who are mainly into fishing profession.

Table 1 shows that 20% do not have a minor occupation, 9.6% said trading was a minor occupation, 5.6% said artisanship was a minor occupation, 46.8% said fishing was a minor occupation, 0.4% said herbalism was a minor occupation, 4.4% said transporting was a minor occupation, 2.4% said cattle rearing was a minor occupation, 6.4% said butchery was a minor occupation, 1.2% said barbing was a minor occupation, while 3.2% said labour work was a minor occupation.

Table 1 shows the responses of the respondents based on credit source. 92.4% said their credit source for fishing activities is through personal savings while 7.6% said it is through cooperatives. It can be said thus that those who source for income from co-operatives are likely to get better yield than their fellow counterparts because they readily buy equipments needed for fishing activities.

Table 2 above shows that most of the respondents are into commercial fishing. It is revealed that those into commercial fishing earn more income than the others.

Table 2 also shows that 77.6% said the reason for fishing is to make profit, while 22.4% said it is for home consumption. It is observed that not all the respondents are into fishing mainly because of profit making as a result there is decline in the fish caught in the area.

Table 2 above indicated that 25.2% said their method of disposal of catch is through middlemen, 52.8% said it is directly to the consumers, while 22% said they do not dispose it at all. Table 2 above shows that most of the respondents are into fishing mainly because of making profit. It is revealed that those who went for fishing early in the morning make more profit than those who

went late in the evening.

From the result in Table 3, 58.8% of respondents said the peak marketing period is between April and June while 41.2% said it is between

Table 2: Distribution of respondents' fishing characteristics
Result on fishing characteristics

Type of fishing		
Commercial	171	68.4
Subsistence	79	31.6
Total	250	100
Reason for fishing		
For home consumption	56	22.4
To make profit	194	77.6
Total	250	100
Method of disposal of catch		
Through middlemen	63	25.2
Direct to consumers	132	52.8
None	55	22
Total	250	100
Years of fishing experience		
1 – 5 years	107	42.8
6 – 10 years	143	57.2
Total	250	100
Fishing period		
Morning	86	34.4
Evening	115	46
Both	49	19.6
Total	250	100
Number of fishing days		
1 - 4 days	18	7.2
5 - 8 days	232	92.8
Total	250	100
Migratory fisherfolks		
Yes	186	74.4
No	64	25.6
Total	250	100
Fishing duration		
4 – 6 months	100	40
7 – 9 months	102	40.8
Above 9 months	48	19.2
Total	250	100
Type of fishing gear used		
Cast net and spear	93	37.2
Hook and line	64	25.6
Lift net and drag net	40	16
Gill net and Gura trap	53	21.2
Total	250	100
Type of fishing craft used		
Dug out canoe	123	49.2
Ghana made canoe	50	20
Out board engine	13	5.2
None	64	25.6
Total	250	100
Age of craft		
1-4 years	127	50.8
5-8 years	59	23.6
None	64	25.6
Total	250	100
Ownership of craft		
Bought	162	64.8
Inherited	30	12
No canoe	58	23.2
Total	250	100

July and September of each year.

The result in Table 3 also shows that 51.6% of the respondents use family labour as the type of labour used in fishing activities and as a result of this, little or no expenses is incurred during fishing activities. 18% use hired labour and 30.4% use self labour. It is also revealed from the study

Table 3: Distribution of respondents marketing characteristics
Result on marketing characteristics

Peak marketing period		
April – June	147	58.8
July – September	103	41.2
Total	250	100
Time of Sale of Catch		
After harvest	163	65.2
After storage	87	34.8
Total	250	100
Type of labour used		
Family labour	129	51.6
Hired labour	45	18
Self labour	76	30.4
Total	250	100
Method of selling fish		
In baskets	164	65.6
Singly	26	10.4
None	60	24
Total	250	100
Average monthly income		
₦1000 – 20000	109	43.6
₦21000-40000	125	50
₦41000-60000	13	5.2
Above ₦60000	3	1.2
Total	250	100
Membership of cooperatives		
Yes	167	66.8
No	83	33.2
Total	250	100
Benefit derived		
Taking loans	98	39.2
Access to middlemen	1	0.4
Control of price	69	27.6
Not a member	82	32.8
Total	250	100
Problems faced in fishing		
Storms	35	14
Post harvest losses	19	7.6
Lack of capital	33	13.2
Harsh weather	23	9.2
Over exploitation	27	10.8
Dangerous aquatic animal	16	6.4
No modern equipments	27	10.8
Flooding	28	11.2
Water borne disease	24	9.6
Inadequate storage facilities	16	6.4
Poverty	2	0.8
Total	250	100
Method of preservation		
Smoking	116	46.4
Sun drying	70	28
Icing	20	8
Salting	44	17.6
Total	250	100

that only those that uses out board engine only spend money on the fueling.

Table 3 reveals that 65.6% of the respondents sell their produce in baskets, 24% sell singly while the remaining 10.4% do not sell their catch at all. Those that do not sell are those that go into fishing simply for home consumption.

The result in Table 3 indicates that 66.8% of the respondents belong to cooperative association while 33.2% does not belong to any fishermen association. The larger percentage recorded from those that belong to an association is largely due to the benefits they derive from such an association.

From the chi-square analysis, it was discovered that there is no significant difference ($p=0.00$ and 0.002) between the two stations in their type of fishing. There is significant relationship between the two stations in their reasons for fishing ($p=0.00$). There is significant difference between the two stations in their fishing period ($p=0.00$). There is significant difference between the two stations in their migratory fishing activity ($p = 0.00$). There is no significant difference between the two stations in their fishing duration per annum.

There is no significant difference between the two stations in their fishing gear and mesh size. There is significant difference between the two stations in their average monthly income ($p = 0.00$). There is no significant difference between the two stations in the type of labour used for their fishing activities. There is significant difference between the two stations in the size of labour required for their fishing activities. There is no significant difference between the two stations in the number of fish caught per day. There is significant difference between the two stations in the selling price of fish ($p=0.00$). There is no significant difference in the preservation method between the two stations.

CONCLUSION

It can be deduce that the various activities around the water body are the reasons why there is a decline of fish catch in study area. A toilet is located directly towards the edge of the water body which releases dark and brown water into

Table 4: Chi Square analysis of the two stations

	Chi-square	df	p
Pearson Chi-square	0.6321759	1	.42656
M-L Chi-square	0.6332872	1	.42615
Yates Chi-square	0.4342131	1	.50993
Fisher exact, one-tailed			.25516
two-tailed			.49629
McNemar Chi-square (A/D)	20.66116	1	.00001
(B/C)	12.4031	1	.00043
Pearson Chi-square	13.02492	3	.00458
M-L Chi-square	13.32676	3	.00398
Pearson Chi-square	31.86423	16	.01042
M-L Chi-square	36.79567	16	.00224

the water. Blood from slaughtered cows are allowed to run freely and the remnants are washed directly into the water body. Also, along the side of the river are those processing the blood which is used as blood meal for producing livestock feed. All the waste from these activities are washed directly into the water thereby polluting the entire water body.

More so, further observation shows that the respondents were using fishing gears with small mesh sizes to catch fish which also affect the amount of fish catch in the study area. It was also observed that the number of fishing effort is high. This is as a result of the large population around the water body.

The study has shown that majority of the respondents had their fishing gear and craft either by inheritance or purchase; this will therefore enable them to adopt better production practices if a government service is extended to the people. Funding was also found to be through personal savings by the majority of the respondents. However, since a large percentage of the respondents are members of one association or the other, assistance in terms of funding could be better channeled through the associations. The socio-cultural characteristics showed that no fewer than four ethnic groups inhabited the study area as a result of the abattoir in the area. Other migrants groups were also found living together harmoniously. However, there is a continuous increase in the load of debris of human and abattoir waste being deposited in the water body.

RECOMMENDATION

From the study carried out so far on the socioe-

conomic lives of fisherfolks in Isheri and Ishasi area of Lower Ogun River, South West, Nigeria, the followings are therefore recommended:

1. Further research should be carried out to determine the physico-chemical parameters of the water body.
2. Associations existing among the respondents should be strengthened by the government and non-governmental organizations.
3. Government and corporate bodies should come to the aid of people living in these communities in order to solve the numerous problems encountered in the study areas.

Finally, considering the ecological and socio-economic importance of fish, it is imperative to put in place measures to adequately regulate the discharge of abattoir effluents into the natural water bodies.

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