

Socioeconomic Analysis of Artisanal Fishing and Dominant Fish Species in Lagoon Waters of EPE and Badagry Areas of Lagos State

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ABSTRACT

The dominant fishes of Epe and Badagry waters, Lagos State, Nigeria as well as the socioeconomic conditions of artisanal fisher folks in Lagos State were studied and analyzed. A total of one hundred and one fisherfolks were interviewed during the study. The study showed that most of the fisherfolks in the area were mainly illiterate and depend mostly on local creditors/middlemen for finance. Fishing activities within the community were found to be profitable. However, the relatively large family size maintained by most of the fishermen portend adverse effect on their economic growth and standard of living. Provision of adequate credit facilities, social and fishing amenities including preservation and transport facilities in addition to enlightened fisherfolks would enhance the socioeconomic status of the artisanal fishermen in the study area.

Keywords: Socioeconomics, fisherfolks, artisanal fishing, species, lagoon waters, Lagos State

INTRODUCTION

In the past three decades, the supply of fish in the Nigerian markets is steadily on the decline. This is largely due to the low catch levels of the traditional fishing techniques and other related factors. Fish is a valuable source of complete protein with the most balanced amino acid profile (Olawusi-Peters, 2008.). The flesh of fish is similar to that of meat in structure, but contains a greater percentage of water. He further notes that fish is more easily digested than meat. Adeyemo (2003) also reported that fish and fish based products provide cheap but high quality protein compared to bush meat, poultry, pork or beef. Apart from protein, fish also contains a wide variety of vitamins which include vitamins A, B (thiamine, riboflavin, nicotinic acid) C, D and E. Fish compliments meat as the cost of the latter is beyond what most Nigerian can afford (Adedokun, *et al.*, 2006, Oladimeji *et al.*, 2013). In Nigeria, the artisanal fishery covers operation of small motorized or non-motorized canoes by fishermen in the coastal areas. This provides jobs for over 400,000 fishermen in the coastal areas and members of their families (Akegbejo-Samsons, 1997). Quite a sizeable proportion of the Nigerian population depends on fishing as a source of income. Apart from being an income earner to many Nigerians especially people in coastal, riverine and lake areas of the country, people earn their living from fish processing and marketing while others engaged in fisheries research (Soyinka and Kusemiju, 2007; Bolarinwa, 2012).

The fisheries sub-sector of the Nigerian economy is made up of artisanal, industrial and cultured fisheries. The artisanal covers the operations of small-scale canoes, fisheries operating in the coastal areas, creeks, lagoons, inshore water and the inland rivers. The artisanal fishery is characterized by low capital outlay, low operational costs, low technology application and it is labor intensive (Adedokun *et al.*, 2006, Bolarinwa, 2014). However, Williams (2006) identified the fishery sub-sector as one of the untapped potential in Africa. The bulk of fishery activities in Africa and particularly Nigeria are carried out by small-scale fish farmers, perhaps this made the sub-sector accounts for an average of 4.87% of the Gross Domestic Product between the year 2000 and 2004 (CBN, 2004). This development contradicts the fact that Nigeria is blessed with abundant varieties of aquatic resources of several inland and fresh waters, lakes, rivers, swamps, flood plains and so on. It is equally against the backdrop that fisheries significantly contributes to the economy in terms of employment

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generation of 10 million people in Africa and food for over 20 million people in the world (Williams, 2006).

A major agricultural sub-sector where achieving food security has become elusive in Nigeria is the fish production subsector. Demand for fish in Nigeria stands at about 1.5 million metric tonnes per annum while domestic production is just 511,700 metric tonnes. The nation spends about N150 billion (US\$1 billion) annually to bridge the gap between supply and demand (CBN, 2011). Consequently, several policy measures have been put in place to stimulate local fish farming. Till date, the results from the colossal investment and policy have not yielded the desired results.

Recent threats all over the world, point to a decline in landing for capture fisheries, an indicator that fish stocks have approached or even exceeded the point of maximum sustainable yield. From statistical data on fish production in Nigeria, production has declined from 1984 till date to less than 400,000 metric tonnes when compared with 508,000 metric tonnes in 1982. (FDF, 2008). Again there is a very high demand for fish in Nigeria with increase in population and income but there is a significant short fall between demand and supply to about 0.44 million metric tonnes. Food even more than clothing or shelter is the indispensable necessity of mankind. Despite various efforts to increase fish production, not much has been done to increase the productivity, profitability, activities, and problems of artisanal fishermen in Lagoon water. Increase in fish production will contribute to the well-being of the economy as a whole as this will improve the nutrition of the nation. Improvement in the nutrition of the nation will amount to national progress. Also, fresh fish provides an excellent source of protein for human diet. Again, with this research, artisanal fishermen might be able use the outcome of this study in the best way to enhance increase in productivity.

It is against this background that this study attempts to provide answers to the following questions:

- i. What are the socio-economic characteristics of artisanal fish farmers in the study area?
- ii. What is the cost structure and profitability of artisanal fish farming in the study area?
- iii. What are the factors that affect profitability and sustainability of artisanal fish farmer in the study area?
- iv. What are the common fish species caught in the areas of study?
- v. What are the different types of fishing gears used at each location and their contribution to fishing activities?

Objectives of the Study

The main objective of the study is to examine the socioeconomics of artisanal fisherfolks and distribution of fish species in lagoon water of Lagos State.

The specific objectives are to:

- i. Describe the socioeconomic characteristics of artisanal fisherfolks in the study area;
- ii. Analyze the cost structure and profitability of artisanal fish farming in the study area;
- iii. Describe the factors that affect the profitability and sustainability of artisanal fisherfolks in the study area;
- iv. Identify the dominant fish species at the landing sites;
- v. Identify the type of fishing gears used at each location and their contribution to fish landing.

MATERIALS AND METHODOLOGY

The study was carried out in Epe and Badagry divisions of Lagos State, a State created on May 27, 1967 by virtue of State (Creation and Transitional Provisions) Decree No. 14 of 1967, which restructured Nigeria's Federation into 12 States. It shares boundaries with Ogun State both in the North and East and is bounded on the west by the Republic of Benin. In the South it stretches for 180 kilometres along the coast of the Atlantic Ocean. The smallest State in the Federation, it occupies an area of 3,577 sq km. 22% or 787sq. km of which consists of lagoons and creeks. Lagos State has 20 Local Government Areas (LGAs) and it is described as the nation's commercial nerve centre. Fishery activities are concentrated in Epe, Ibeju-Lekki, Eti-osa and, Badagry. Both primary and secondary data were used to achieve the objective of the study. The instrument used to obtain data was through pre-test, well-structured and validated interview schedule directed at the artisanal fishermen in Epe and Badagry Area of Lagos State.

Techniques of Data Analysis

Objective 1 was analysed using descriptive statistics while objective 2 was analysed using budgetary analytical technique.

$$\Pi = TR - TC;$$

$$GM = TR - TVC$$

$$TC = TFC + TVC$$

Objective 3 was however analysed using descriptive statistics while objective 4 was analysed using regression analysis. The regression equation is stated thus:

$$Y = f(X_1, X_2, X_3, X_4, \dots, X_n)$$

Where

Y = Quantity of fish harvested per month.

X₁ = Number of fishing trip per month,

X₂ = Size of net,

X₃ = Labour in man days

X₄ = Gender

X₅ = Age

X₆ = Years of experience,

X₇ = Level of education,

X₈ = Size of household,

RESULTS AND DISCUSSION

Socioeconomic Features of the Respondents

The descriptive analysis of socioeconomic characteristics of respondents in the study area in Table 1 shows that age is an important socioeconomic characteristic because it affects productivity, output and adoption of innovation. It was observed that majority (37.3%) and (35.3%) of the respondents' ages in Epe and Badagry are between 40 and 49 years and between 30 and 39 respectively. 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 Olaoye (2010). 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 the 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 (72.5%) and 82.4% of the respondents in Epe and Badagry 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 (Jibowu, 1992; Adeyemiet *et al.*, 2002).

Education plays important role in technology adoption. Results showed 74.5% and 43.1% have one form of educational exposure, but was higher in Epe than in Badagry. This result substantiated the findings of Lawal and Idega (2004). A relatively large household size was found in the study with a size of 5 persons per household with Epe having 37.3% and Badagry 33.3%. The finding supports the preponderance of large family sizes among the poor in rural areas (Kumolu-Johnson and Ndimele, 2010). However, small-scale fishing is very labour intensive, requiring labour contribution from the fisher's 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 larger families that can contribute positively to their livelihood. Membership of cooperative society was dominating, as result in table 1 revealed percentage range of 62.9% to 60.8% for Epe and Badagry respectively. Most respondents earned income above ₦200,000 per annum, indicating a fair motivation to the business.

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Family source of capital dominates (72.5%) the enterprise in the study areas. Clark *et al.* (2005), for instance, reported that the non-availability of a credit scheme taking into full consideration the peculiar circumstances of small-scale fisheries militate against capital –intensive expansion. Shortage of credit facilities was one of the major constraints to artisanal fishermen(Anyanwuet.al,2009).

Table1. Frequency distribution on socioeconomic features of respondents

Variable	EPE			BADAGRY	
	Categories	Frequency	%	Frequency	%
Gender	male	46	90.2	42	82.4
	female	5	9.8	8	15.7
Marital status	Married	37	72.5	42	82.4
	Single	14	27.5	8	15.7
Age (years)	20 – 29	3	5.9	9	17.6
	30 – 39	14	27.5	18	35.3
	40 – 49	19	37.3	6	11.8
	50 – 59	9	17.6	5	9.8
Educational Level	Above 60	6	11.8	12	23.5
	No formal education	13	25.5	29	56.9
	Primary school	16	31.4	8	15.7
Religion	Secondary school	18	35.3	13	25.5
	ND/NCE	4	7.8	0	0
	Christian	32	62.7	45	88.2
	Muslim	19	37.3	4	7.8
Household Size	Others	0	0	1	2.0
	3	14	27.5	17	33.3
	4	6	11.8	4	7.8
Level of hired labour	5	19	37.3	17	33.3
	6	11	21.6	12	23.5
	Nil	1	2.0		
	None	7	13.7	6	11.8
Annual income	1 – 3	26	51.0	26	51.0
	4 – 6	1	2.0	17	33.3
	7 – 10	1	2.0	0	0
Source of capital	Above 11	4	7.8	1	2.0
	< 50,000	1	2.0	1	2.0
	>100,000	7	13.7	3	5.9
	>150,000	6	11.8	8	15.7
Level of fish catch	=200,000	16	31.4	21	41.2
	>200,000	21	41.2	18	35.3
	Formal	7	15.9	7	13.7
Level of fish catch	Informal	37	72.5	37	72.5
	Nil	7	13.7	6	11.8
Level of fish catch	Small	20	38.5	5	10.0
	Medium	19	36.5	32	64.0
	Large	12	23.0	13	26.0

Source: FieldSurvey, 2014

Identification of Common Fishing Gears in the Study Areas

It was essential to establish respondents’ fishing gear used as it would enable the researcher have insight on most type of gears used by the respondent in the study area. Results show that 37.3% used hook and line as against 26.0% in Badagry and Epe respectively, whereas 27.6% used cast net and scoop net in Badagry as against 40.0% in Epe. 44.0% and 39.0% used 2 finger by 10(25.4mm) net in Epe and Badagry respectively.

Table2. Frequency Distribution of Common Fishing Gears

Fishing gear	Badagry		Epe	
	%	%	Frequency	%
Gill net	3	5.9	3	6.0
Cast net and scoop net	14	27.6	20	40.0
Hook and line	19	37.3	13	26.0
Scoop net and gill net	9	17.6	7	14.0
Gill net and cast net	5	9.8	7	14.0
4 finger by 16(25.4mm)	9	17.6	14	26.9

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2 finger by 10(25.4.mm)	20	39.2	22	42.3
4 finger by 10(101mm)	11	21.6	6	11.5
2 finger by 14(..mm)	5	9.8	6	11.5
4 finger by 22(..mm)	6	11.8	3	5.8

Profitability of Artisanal Fishing

The gross margin estimate for Epe and Badagry were ₦62,200 and ₦51,750 respectively with better performance from Epe. This was the trend for the Net Profit of ₦13,150 and ₦22,300 for Badagry and Epe respectively. From this study, the profitability index (PI) which is net profit (NP) divided by total cost (TC) was estimated and the result showed that Badagry had an index of 0.211 whereas Epe had 0.358 suggested that artisanal fishermen in Epe are more productive than their counterpart in Badagry. This result is supported by the study of Kareem *et al* (2012). This results show that the artisanal fishery business is highly profitable as noted by Abowei and Hart (2008) ;Aneneet *al.* (2010).

Table3. Cost Returns Structure of Artisanal Fishing in Lagos State, Nigeria.

Variable	Badagry	Epe
Revenue(N)		
Sales of fish	75,200	80,000
Variable cost		
Fuel	3600	4500
Fire wood	12000	6000
Labour	1600	1500
Transportation	3000	2000
Rope	500	300
Basket	1200	1500
Lamp	1550	2000
Total variable cost	23,450	17,800
Fixed cost		
Canoe	31,000	32,000
Paddle	950	700
Cost net	4500	3500
Smoking kiln	2150	3700
Total fixed cost	38600	39900
Total cost	62050	57700
Gross margin	51750	62200
Net profit	13150	22300
Profitabilityindex(PI)	0.211	0.358

Computed from Field data, 2014

Dominant Fish Species in the Study Area

From the table below, 70% of the respondents’ major catch were mullets (*atoko*) and soles (abo); 76% caught *Chrysichthysnigrodigitatus* (obokun); 60% caught (*Tilapia*) *Tilapia guineensis* and 44% caught (shrimps) in Badagry area of Lagos State. However, in Epe, 50% catch mullet and soles; 18% catch *Synodontisspp*(Akokoniko) 40% caught *Heterotisniloticus*(aika); 38% catch *Chrysichthysnigrodigitatus* (Obokun); 28% caught *Tilapia guineensis* and 8% caught *Gymnachusniloticus* (ejaosan)

Table4. Species Catch Distribution in Study Area

Botanical name &(common name)	Badagry		Epe	
	Frequency	%	Frequency	%
Mullet(<i>Mugil spp & Liza spp</i>)(Atoko)	35	70%	25	50%
Cynoglossusspp (Sole) Abo	35	70%	25	50%
<i>Synodontisspp</i> (Akokoniko)	-	-	9	18%
<i>Heterotisniloticus</i> (Aika)	-	-	20	40%
<i>Chrysichthysnigrodigitatus</i> (Obokun)	38	76%	19	38%
<i>Tilapia guineensis</i>	30	60%	14	28%
<i>Penauesduorarum</i> (pink shrimp)	22	44%	-	-
<i>Gymnachusniloticus</i> (Ejaosan)	-	-	4	8%

Source: Field Survey, 2014.

Major Challenges of Artisanal Fishing in the Study Areas

The study examined the constraints facing the fisherfolks in Epe and Badagry areas of Lagos State. The distance to markets and inaccessibility to credit predominate the challenges in the artisanal fishing in both Epe and Badagry areas. However, the inaccessibility to credit, high fuel cost, climatic conditions and poor boat maintenance were the severe issues. The study attempted to assess the major challenges affecting the sustainability and profitability of artisanal fishing in the study areas whether it is very severe, severe and non-severe to the respondents. The results on aggregation show that most constraints were regarded as severe by the respondents. For instance, the high cost of equipment, variability of climate, infestation by water hyacinth among others were major severe variables that limit the catch from artisanal fishing.

Table 5. Major constraints of artisanal fisher folks

Problems	Very severe		Severe		Non-severe	
	Freq	%	Freq	%	Freq	%
Inaccessibility to credit	8	15.7	31	60.8	11	21.6
Scarcity & high cost of net	6	11.8	31	60.8	10	19.6
High cost of equipment	6	11.8	33	64.7	7	13.7
Climatic conditions	4	7.8	43	66.7	10	19.6
Distance to market for inputs	7	13.7	29	56.9	11	21.6
Poor boat maintenance	7	13.7	23	45.1	7	13.7
Poor gear design	8	15.7	32	62.7	10	21.3
Infestation by water hyacinth	11	21.6	31	60.8	7	13.7
Menace of trawlers	7	13.7	29	56.9	11	21.6
Unavailability of Spare parts	10	19.6	29	56.9	9	17.6
Difficulties of access	7	13.7	26	51.0	10	19.3
Inadequate technology	10	19.6	24	47.1	11	21.6

Source: Survey, 2014

CONCLUSION AND RECOMMENDATIONS

The study revealed that the business of artisanal fishing is profitable in both locations, the non-availability of a credit scheme taking into full consideration the peculiar circumstances of small-scale fisheries militate against capital –intensive expansion. Generally, lack of liquidity and the poverty of the practitioners have retarded the growth of artisanal fisheries (Akanni and Akinwunmi, 2007; Olaoye *et.al*, 2010; Baruwa *et.al*, 2012). The availability of credit facilities for the use of the artisanal fisher folks could also increase the likelihood of their adopting the use of outboard engines as against the use of traditional, manual-propelled boats/canoes. The credit facilities will enable the fishermen to acquire the fishing machines that are capable of reaching far into distant waters and thus increase the fish catch levels of the artisanal fisher folks. This is important, because the nearby coastal waters are usually over-exploited and therefore depleted. Again, the target of increasing fish catch level by the fisher folks could also make them abandon the manually paddled canoes and adopt the use of modern outboard engines that reach out far into the water to make good catches (Akanni, 2008).

Recommendations

- Because of the role credit plays in productive ventures, the Government should make credit more accessible to the fishermen. The non-availability of a credit scheme taking into full consideration the peculiar circumstances of small-scale fisheries militate against capital –intensive expansion. Shortage of credit facilities was one of the major constraints to artisanal fishermen. Generally, lack of liquidity and the poverty of the practitioners have retarded the growth of artisanal fisheries. The availability of credit facilities for the use of the artisanal fisher folks could also increase the likelihood of their adopting the use of outboard engines as against the use of traditional, manual-propelled boats/canoes. The credit facilities will enable the fishermen to acquire the fishing machines that are capable of reaching far into distant waters and thus increase the fish catch levels of the artisanal fisher folks. This is important, because the nearby coastal waters are usually over-exploited and therefore depleted. Again, the target of increasing fish catch level by the fisher folks could also make them abandon the manually paddled canoes and adopt the use of modern outboard engines that reach out far into the water to make good catches.
- The fisherfolks should come together as group or cooperatives to be able to gain the benefits of economies of scale. This has become necessary to enhance the use more improved equipment which could impact positively on the productivity of the business.

- c) For the fisherfolks to make better price of their products, they should engage in forward integration by having refrigerators to preserve their catches and processing.

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