

**PROFITABILITY OF FISH PRODUCTION AMONG MEMBERS OF COOPERATIVE SOCIETIES IN OKRIKA LGA IN RIVERS STATE**

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**ABSTRACT**

*In many riverine areas, fish farming is not a new venture, but the challenge is to meet the fish demand for people. The study examined profitability of fish production among members of cooperative societies in Okrika Local government area of Rivers State, Nigeria. Two hypotheses that were formulated in line with the study specific objectives and research questions guided the study. The theoretical anchor of the study is on collaboration theory. The descriptive survey design guided the study and questionnaire was the major instrument of data collection. Data obtained were analysed using descriptive analytical tools like frequency tables, averages, percentages, scale analysis. The findings revealed that there was a weak but significant correlation ( $r=0.219$ ; significant @  $.001$ ) between years of cooperative membership and fishing investments. Again, there was a modest correlation ( $r=0.513$ ; significant @  $.001$ ) between fish revenue and net returns. The study concluded that there is a significant relationship between years of cooperative membership and investments in fishing years by fishers, as well as between fish revenue and net returns. Therefore, the study recommends amongst others, that cooperatives should assist members in the marketing and/or disposal of the fish caught so as to obtain competitive bargains from fish consumers, especially in the urban centres.*

Key words: Profitability, investment return and investment cost

**INTRODUCTION**

Fisheries constitute an important sector in Nigerian agriculture, (Kudi et al, 2008) providing valuable food (Ohen and Ahang, 2007, Etim et al 2007) and employment to millions and also serving as source of livelihoods mainly for rural dwellers in coastal communities. Fishing communities such as Okrika local government area had from time engaged in fishing business. The value of the fish is held very high as the average fisherman reserves the biggest portion for his consumption.

In recent years the reverse is the case as fisherman sells all without keeping any for consumption. This is sequel to the fact that several challenges had influence his catch and return. Fishing co-operative had been

recognized to be helpful in supporting fishing activities in the rural areas. It has been noted that Fishing makes an important contribution to world protein as it serves as supplement for animal protein especially as cost of affording animal seems to be far beyond the reach of an average income earner (Samson, 1997). Nigeria has a coastline of 3,122km shared by 8 states (Lagos, Ogun, Ondo, Delta, Bayelsa, Rivers, Akwa-Ibom and Cross River) out of a total of 36 states in the country, and this coastal fisheries are important and contribute at least 40 percent of fish production from all sources in Nigeria between 1995 and 2008 (FAO, 2011).

The fishery activities in Nigeria are mainly done by the artisanal sector. The coastal and the brackish water constitutes the major areas of production, followed by the inland rivers and lakes. Aquaculture production and industrial fishing is still at very low ebbs. Since 1987, there has been a yawning gap between domestic demand of 1.5 million metric tons and domestic supply of 0.5 million metric tons of fish. Initially, this demand-supply gap was not noticeable when the economy was buoyant as a result of importation of frozen fish. However, the present economic recession and scarcity of foreign exchange to pay for import, has necessitated the need to step-up production through aquaculture. The huge import bill on frozen fish by the Federal Government of Nigeria which amounted to N30 billion (\$400m) in year 2002 alone calls for urgent attention in the area of artisanal and aquaculture production. In the same vein, the growing urbanization, improved market integration and the concurrent supply crises from capture fisheries, small and larger scale investment are gaining interest in aquaculture production which provides a source of income rather than simple subsistence, and can be incorporated into local agricultural systems to diversify production base.

But the needed vibrancy and growth in the sector has not been realized due to certain constraints. Readily identifiable here are poor infrastructures, high level of rural poverty (over 80% of rural poor live below the poverty line), environmental problems (e.g. pollution in coastal areas arising from gas flaring, oil spills and industrial wastes), civil unrest in the Niger Delta, climate change effects (sea level rise, coastal erosion and flooding, increased environmental temperatures and wind storms) and degradation of coastal areas through human action (e.g. sand-filling activities which destroy breeding grounds). Indeed, these may have been responsible for reluctance of investors to move into the sector.

But high prices of the various fish species such as cat fish and tilapia and the size of fish consuming population are indicators that fish farming could still be viable and worthwhile investment. Attempts made to identify constraints affecting the aquaculture subsector in Nigeria revealed the tendency to consider fish farming as a foreign donor-driven technology, characterized by inherent multi-dimensional constraints (FAO 2000). These constraints were site-specific and the envisaged solutions to them were deemed to be above the ability and circumstances of the largely small-scale fish farmers who were more familiar with artisanal and inland fishing activities.

### **Problem Statement**

Generally speaking, small-scale fishers do not often have the financial management skills to adequately manage their resources to optimize their revenue, and thence their profit. It does then appear to suggest that growth of the industry will ultimately depend on the socioeconomic characteristics of the fishers such as capitalization, educational level, fishing experience, gender, as well as membership of cooperatives. In particular, fishers' cooperatives may have a big role to play in raising profitability of artisanal fish farming. It is believed that Cooperatives in the small-scale fisheries sector are a way of maximizing long-term community benefits to deal with the threats of fisheries mismanagement, livelihood insecurity and poverty (harsh realities for many of the world's small-scale fishers). Available studies have focused largely on quantum of fishes caught and the associated revenue in Rivers State; but without being specific on Okrika LGA. This is considered a research gap. Also only few of available studies factored in the influence of membership of cooperatives and the associated activities on revenue, as well as fishing input supplies as possible factors explaining variations in profitability among fishers who belong to cooperative societies. Therefore, there is a need for the present study on fish production to carefully examine these research gaps.

### **Study Objectives**

The main objective of this study is to examine the relationship between fish production and its profitability among members of co-operative associations in Okrika Local Government Area, Rivers State. Specifically the study sought to: (i) determine the relationship between years of cooperative membership and returns on fishing investments; and (ii) assess the relationship between fishing inputs obtained from cooperatives and net returns on fishing investments.

### **Research Questions**

- (i) Does a relationship exist between fishers' years of cooperative membership and returns on fishing investment?
- (ii) Is there a relationship between fishing inputs obtained from cooperatives and net returns on fishing investments?

### **Research Hypothesis**

- (i) There is no significant relationship between fishers' years of cooperative membership and returns on fishing investment
- (ii) There is no significant relationship between fishing inputs obtained from cooperatives and net returns on fishing investments

## **RESEARCH METHODOLOGY**

### **Research Design**

This study was of a survey design. Also, to the extent that the study sought to assess the existence or otherwise of a relationship between fish production and its profitability, the analysis was correlational.

### **Area of Study**

This study was carried out in Okrika Local Government Area (LGA) of Rivers State South, Nigeria. Okrika is a Port town in Rivers State, capital of the LGA of the same name. The town is situated on a small island just south of Port Harcourt, making it a suburb of the much larger city. The average elevation of Okrika is 452 metres. It lies on the north of the Bonny River and on Okrika Island, 35 miles (56 km) upstream from the Bight of Biafra. The town can be reached by vessels of a draft of 29 feet (9 metres) or less.

### **Historical Background of Okrika LGA**

Formerly a small fishing village of the Ijaw people in the mangrove swamps of the eastern Niger River delta, Okrika became the capital of the Okrika kingdom in the early 17th century and actively dealt in slaves. It served as a port for the exportation of palm oil after the abolition of the slave trade in the 1830s, but it was a less significant port facility than either Bonny (46km South) or Opobo (81km Southeast). By 1912, Okrika had been completely eclipsed by Port Harcourt, and it was not revived as a commercial port until 1965, when the nearby Alesa-Elеме oil refinery was completed and pipelines were built to a jetty on Okrika Island. It also has a major gas plant facility (Alakiri gas plant) that supplies to the refinery and others. Refined petroleum products are Okrika's only significant exports. The town has considerable local trade in fish, oil palm produce, locally processed salt, cassava (manioc), taro, plantains, and yams.

The 2006 census determined the population of the Okrika LGA of the Rivers State of Nigeria was 222,026. Nine traditional towns constituted the Okrika Kingdom before 1913, these towns are Kirike, Ogoloma, Ogu, Bolo, Abuloma, Ogbogbo, Ibaka, Ele and Isaka. Most of these traditional towns also have satellite villages. Today the constituent towns of Okrika kingdom has increased to eleven towns. The additional two towns are Obumoton (Part of Port Harcourt City) and Koniju Town (Koni-ama). Obumoton is a collective name for Okrika villages acquired by the British Colonial Government in 1913 to establish a sea port now Port Harcourt. Some Ikwere Igbo villages were also acquired by the Colonial Government. Obumoton (old Port Harcourt township) is also part of Okrika Kingdom. The Koniju section of Kirike was declared Koniju town by a Rivers State high court in 1995. It is now also a constituent town of Okrika Kingdom.

The traditional towns that constitutes the Okrika nation has therefore increased from nine towns prior to 1913 to eleven towns as at 1995. The constituent towns are therefore: Okrika Town; Ogoloma Ogoloma

Town; Ogu Town; Bolo Town; Okuru Ama Town; Amadi-ama; Abuloma Town; Ibaka Town; Ogbogbo Town; Ele Town; Isaka Town; Obumoton; and Koniju Town.

**Population of Study** The study population consisted of all the members of the 11 registered Fishing Cooperatives in Okrika town, and they were 806.

### **Sample size and Sampling Techniques**

Samples are meant to represent a population when the entire population cannot be studied. In this study, multi stage sampling and simple random sampling were used. Out of the total of 806 members that made up the membership of the 11 registered fishery cooperatives in the LGA, 322 (40%) were conveniently selected as the study sample. This sample is clearly more than 10% of the population which conventionally is adequate. This study was encouraged in the choice of this sample size of 322 by the counsel of Alreck and Settle (1995), who maintain that it is seldom necessary to sample more than 10%.

### **Sources of Data**

Both primary and secondary sources of data were explored in the course of this study. Primary data were obtained through the use of structured questionnaires and personal interviews. Secondary data were collected from journals, related research reports, official government documents, conference papers, as well as the internet; the latter specifically for the purpose of the introductory section and the study literature review.

### **Method/Instrument of Data Collection**

The Questionnaire was the main instrument of collecting data; although this was complemented with some sessions of interviews. 332 copies of the study questionnaire were thus administered on the respondents. However, only 300 (representing a rate of return of 93.17%) useable copies of the questionnaire administered were eventually retrieved; and this represented the study sample size.

### **Tools of Data Analysis**

Data obtained from respondents were analyzed using descriptive analytical tools such as frequency tables, averages, percentages. Scale analysis were specifically used to describe, the socio-economic characteristics of the fishermen. Simple budgetary analysis was deployed to analyse costs and returns in fish marketing, while the straight line depreciation method was used to estimate depreciation on fishing gears used by fishermen.

The budgetary model was given by the expression:

$$NR = FR - (\sum X_1 \dots n)$$

Where:

NR = Net return from marketing of fresh fish

X<sub>1</sub> = local government revenue (N)

X<sub>2</sub> = Transport charges (N)

X<sub>3</sub> = Packaging or repackaging cost (N)

X<sub>4</sub> = Labour cost for catching fish (N)

X<sub>5</sub> = depreciation on fishing gears (per day) (N)

FR = Revenue realized from selling fresh fish by the fishers (N).

Inferential statistics (correlation) was used to evaluate relationships between and among variables. The Pearson Product Moment Correlation was adopted to establish the relationship between years of cooperative membership and quantum of fish caught by the fishers; and between revenue of fishers and fishing inputs obtained from cooperatives, and to test formulated hypotheses.

### **Socio-economic characteristics of the respondents**

The socio-economic characteristics of the members are analyzed in terms of their gender, age, marital status, educational level, family size, cooperative experience and status in the society. The observed socio-economic characteristics of respondents are presented below (table 1).

**Table 1: Distribution of Respondents According to Socio-economic characteristics**

	FREQUENCY	PERCENTAGE
<b>Gender</b>		
Male	180	60.0
Female	120	40.0
Total	300	100.0
<b>Age:</b>		
18 – 30	30	10.0
31 – 45	137	45.7
46 – 60	112	37.3
Above 60yrs	21	7.0
Total	300	100.0
<b>Marital Status:</b>		
Single	33	11.00
Married	183	61.0
Widow/widower	58	19.3
Divorced	26	8.7
Total	<b>300</b>	100.0
<b>Household Size:</b>		
< 5	110	36.7
6 – 10	117	39.0
11 – 15	61	20.3
>15	12	4.0
Total	300	100.0
<b>Educational</b>		
No formal Education	3	1.0
FSLC	36	12.0
WASSC/SSCE	91	30.3
NCE/OND	79	26.3
B.Sc./HND	62	20.7
M.Sc/Ph.D.	29	9.7
Total	300	100.0

**Table 2 No. of Years of Membership**

1- 5	21	7.0
6- 10	169	56.3
11 – 15	81	27.0
16 – 20	27	9.0
Above 20	2	0.7
Total	300	100,0

**Source: Survey data, 2017**

The gender distribution of the respondents shows that 60% were male while 40% were female. This should not be interpreted that there are more male than female cooperative members in the study area. The distribution according to age reveals that a majority of the respondents were between the age group of 31-45years followed by the age group of 46- 60years.

The analysis of respondent according to their marital status reveals that 8.8% of the respondents were single, 61% were married, 19.3% were widowed, and 8.7% were divorced. Thus, it shows that the majority of the respondents were married.

The table also indicates that the household size of the respondents was on the average, high: 42.3% had family size of less than five members, 39% of the respondents had 6-10 members, 20.3% had family size range of 11-15 members while 4.0% had above 15 members. The distribution according to age reveals that 98.8% had acquired one level of education or the other.

The distribution according to educational level attained shows that over two-thirds of the respondents have had at least WASC or GCE. Only one percent has had no formal education. Twenty six percent and almost 27% had either OND/NCE or BSc/HND. Also 9.7% had either MSC or MA degrees.

Majority of the respondents (56.3%) had been members for between 6-10years, 27% had been members for between 11-15 years, 6.5% had 16-20years and 7% had 5years or less. Indeed, the distribution clearly reveals that 93% of the respondents had over 5years of cooperative experience.

### **Investment and returns of the artisanal fishers in Okrika LGA**

**Table 3: Fishermen investments on fishing gears.**

	<b>N</b>	<b>Sum</b>	<b>Average per fisher</b>	<b>Std. Deviation</b>
Out board engine	300	1913126.00	6377.0867	1293.64519
Canoe	300	1434844.50	4782.8150	970.23389
Fish traps	300	358711.13	1195.7038	242.55847
Floats	300	286968.90	956.5630	194.04678
Cast net	300	260880.82	869.6027	176.40616
Hooks	300	602674.20	2008.9140	2813.80484
Compass	300	148484.67	494.9489	100.40451
Total investment	300	5005690.21	16685.6340	4097.46531
Depreciation (10%)	300	500569.02	1668.5634	409.74653
Valid N (listwise)	300			

**Source: Survey data, 2017**

The average investment of a fisherman in the study area was estimated at N16.686 (Table 3). This capital is required to obtain the fishing gears, which are necessary for a fisherman to compete effectively in the fishing industry of the State. The fishermen invested N6377 and N4,783 in out board engine and canoe respectively. Other investments were on hooks (N2008), fish traps (N1,196), floats (N956), cast nets (870), and compass (N495).

**Table 4: Costs and returns of fish marketing, 2017**

	<b>N</b>	<b>Sum</b>	<b>Average per fisher</b>	<b>Std. Deviation</b>
<b>Fish Revenue</b>	<b>300</b>	<b>142745160.00</b>	<b>475817.2000</b>	295434.56782
Packaging	300	9248699.00	30828.9967	32342.08840
Transport	300	9402521.00	31341.7367	19296.59996
Labour	300	83091850.00	276972.8333	137777.73496
Depreciation	300	500569.02	1668.5634	409.74653
NetReturn	300	<b>40501520.98</b>	<b>135005.0699</b>	308428.16224
Net Return per Naira invested		8.0813	8.0913	
Valid N (listwise)	300			

**Source: Survey data, 2017.**

Table 4 shows the marketing prices, costs and returns according to selling location. Cost incurred in fishing reveal that labor was the highest single cost item with about N276,973. Other items in the expenditure profile

of the fishers are transport (N31,342), packaging (N30,829, and depreciation (N1,669). The net return from marketing of fresh fish was estimated as the difference between fishermen’s fish revenue and the total marketing costs incurred. Fishermen prefer to sell their catch at waterside to either urban wholesalers or retailers because these categories of buyers offer better prices. However, they also sell to some retailers who buy directly from the waterside.

The net returns from sales of fresh fish among fishermen in the State, nevertheless, the fishermen sell their catch to urban wholesalers to make an average net return of N135,005. Net returns per Naira invested was over N8. Further investigations revealed that cooperative societies were not dynamic and did not assist fishermen in marketing decision. Similar result was reported by Demena (2011) that although majority of the fishers encountered marketing problems, membership of cooperative societies played no major role in solving them. Literature reveals that fishermen can gain more profit margins through their involvement in value addition, product diversification, improvement of product quality and the access to new markets.(INFOFISH, 2008)

### TEST OF HYPOTHESES

#### Hypotheses one:

H<sub>0</sub>: There is no significant relationship between years of cooperative membership and returns on fishing investments of fishers.

H<sub>1</sub>: There is significant relationship between years of cooperative membership and returns on fishing investments of fishers.

**Table 5: Correlation on the relationship between Years of Cooperative Membership and Returns on Fishing Investments**

		Years of Coop. Membership	Returns on Fishing Investments
Years of Coop. membership	Pearson Correlation	1	0.219**
	Sig. (2-tailed)		0.01
	N	300	300
Returns on Fishing Investments	Pearson Correlation	0.219**	1
	Sig. (2-tailed)	0.01	
	N	300	300

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient as presented above (table 5) shows a weak correlation of 0.219 between years of cooperative membership and fishing investments, it was however significant at 0.01 levels. As a result of this, the null hypothesis one is rejected and the alternate hypothesis one is accepted. We then conclude that there is a significant relationship between years of cooperative membership and investments in fishing gears by fishers. Therefore, the result implies that cooperative membership has brought increased awareness on the members on the necessity to invest on fishing gears.

#### Hypotheses two:

H<sub>0</sub>: There is no significant relationship between fishing inputs obtained from cooperatives and net returns of fishers’ investments.

H<sub>1</sub>: There is significant relationship between fishing inputs obtained from cooperatives and net returns of fishers’ investments.

**Table 6: Correlation on the relationship between Fish Revenue and Net Returns on Fishing Investments.**

		Fish Revenue	net returns on investments
Fish Revenue	Pearson Correlation	1	.513**
	Sig. (2-tailed)		.01
	N	300	300
Net Returns on Investments	Pearson Correlation	.513**	1
	Sig. (2-tailed)	.01	
	N	300	300

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient as presented above (table 6) shows a modest correlation of 0.513 between fish revenue and net returns and it was significant at 0.01 levels. As a result of this, the null hypothesis two is rejected and the alternate hypothesis one is accepted. We then conclude that there is a significant relationship between fish revenue and net returns. Therefore, the result implies that net returns from investments are keeping pace with fishing revenue.

## CONCLUSION AND RECOMMENDATION

The findings are summarized and recommendations were made on the research as follow:.

### Summary of Findings

This study determined the profitability of fish production among members of cooperative societies in Okrika LGA, Rivers State Nigeria. Based on the results of the analysis the following were summaries of the relationships between years of cooperative membership and returns on fishing investments by fishers; and fishing inputs obtained from cooperatives and net returns of fishers' investment.

1. There is significant relationship between years of cooperative membership and returns on fishing investments of fishers ( $r = .219$ ; significant at 0.01).
2. There is significant relationship between fishing inputs obtained from cooperatives and net returns of fishers' investment ( $r = .513$ ; significant at 0.01).

### Conclusion

Fish production present a lot of opportunities under good hydrology. It is a situation whereby people use tools to catch fish for sale. Fish provides a very good nutrient supplement for man as it improves the diets of people and contributes to the nation's food security. Fish production can be cultured or captured from the inland waters or marine waters. Three types of aqua culture have been identified as semi-intensive, intensive and extensive pond; while capture system is the situation where farmer use boat with other implement to go into the sea to catch fish with hook, net or other means. The present study is focused on the capture system. The objectives of the present study were to assess the profitability of fish production among members of cooperative societies in Okrika LGA of Rivers State, Nigeria: to assess the relationship between years of cooperative membership and returns on fishing investments; as well as to assess the relationship between fishing inputs obtained from cooperatives and the net returns on investments among members of cooperative associations in Okrika LGA, Rivers State. To address these objectives, both descriptive and correlation analyses were conducted using data collected through field survey. In terms of the synergies deriving from the cooperative membership fish capturing was found to be a profitable business as evidenced by the returns from sales of fresh fish of N135,005 and Net returns per Naira investment of over N8. It is therefore hoped that as cooperatives endeavour to assist the fishers with increased investments in fishing gears, their fish catch increases and so also their profitability.

### Recommendations



Based on the findings and conclusion of this research work, the following recommendations were proffered:-

- i. Governments at both local and state levels, and especially the agencies that are saddled with responsibility of artisanal fishing promotion are urged to make use of cooperatives as channels for getting through to genuine fishers in the rural areas, and drawing awareness to the lucrative nature of fish farming to both subsisting and prospective farmers in the rural ties. . It is also suggested that governments should consistently make funds available make funds available to fishery cooperatives for on-lending to fishers for adequate funding of their fishing gears and inputs for sustainably improved fish farming and profitability. ii. These governmental interventions should be complemented with enhanced marketing strategies so as to obtain competitive bargains from fish consumers, especially in the urban centres.

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