Rural Economics and Development

Analysis of Costs and Returns of Artisanal Fish Marketing in Kebbi State, Nigeria

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Abstract

Fishermen involved in marketing and distribution of their daily fish catch incur additional cost apart from fishing. This study analyzed the costs and returns of artisanal fishing activity in Kebbi State, Nigeria. A multi-stage sampling method was used to select 82 fishermen which constituted the sample size for the study. Descriptive statistics and net return model were used to analyze data collected. Results revealed that 47.1% were within the age range of 25-40 years, 11.8% had formal education and 84.4% were engaged in fishing as their major occupation. The average investment of a fisherman in the study area was estimated at ₦ 64, 267, while net returns from sales of fresh fish varied between ₦ 58.22 and ₦ 208.2 for whole sellers and retailers respectively. The study concludes that although fishing is profitable, the return on investment is low thereby leaving the operators vulnerable to loss in case of downward shift in market price of fish. The study recommends that more fishermen should be encouraged to seek for alternative sources of income, while others are provided with fishing inputs or trained on modern fishing techniques and fish farming. Inactive fishermen cooperatives should be strengthened for better bargaining power for higher returns.

Keywords: *Artisanal fishing, Fishing inputs, Cost, Net return*

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Introduction

Artisanal fishing is a main source of livelihood for those residing in riverine communities. According to the FAO glossary annex, they are sometimes referred to as small-scale fisheries. These are traditional fisheries involving fishing households, using relatively small amount of capital and energy, small fishing vessels (if any), making short fishing trips, close to shore, and mainly for local consumption. Artisanal fisheries can be

subsistence or commercial fisheries, providing for local consumption or export (FAO, 1998). Previous studies (Fregene, 2002, Ojo 2004, Suleiman, 2007) revealed that fishing is an economic activity which requires capital investment which is characterized by the use of dug-out, wooden canoes that are often not motorized, operated by individual or small groups using labour intensive gears of relatively low level of productivity. In general, artisanal capture fisheries, which are low capital, low operational costs and limited gear coverage, characterize fishing activities in Nigeria (Fregene *et al*, 2003). It may not be capital intensive at the level of artisanal fishermen in the north because subsistence practices characterize the artisanal fisheries as also observed in Lagos and Rivers States by Adesehinwa and Bolorunduro (2007). Fishing inputs commonly used include canoe, paddles, hooks, gill nets, cast nets, beach seining and drift nets.

However, there are costs component associated with fishing and the disposal of the catch. This is true as fishermen are engaged in marketing and distribution of their daily catch (fresh fish) in addition to fishing. The marketing activities carried out by fishermen include transportation of catch via various means (use of canoe, donkey, bicycle, motor cycle etc) from the waterside to various markets for on-ward selling, preservation of fish to reduce post-harvest loss of the highly perishable commodity. Although fishermen do not incur production costs, they employ labour to catch (harvest) fish from natural water bodies and incur costs in their daily struggle to dispose the highly perishable commodity.

Price is determined by direct bargaining between the sellers and buyers (Alam *et al*, 2012). This is the experience of many developing countries where artisanal fishermen operate. At the primary markets, fishermen lack bargaining power and market information. The lack of bargaining power is mostly due to the highly perishable nature of fish as a commodity and the gluts experienced at certain periods. In such instances, the fisherman is forced to sell at a price resulting in low net returns or net margin or profit. Lack of adequate fish handling, processing techniques and storage facilities have therefore contributed significantly to the low supply of fish to poor rural dwellers that depend on fisheries as a source of livelihood.
The focus of this paper is to analyse costs and returns involved in the supply of fish from the point of catch to consumer in the study area; as well as to determine the profitability of artisanal fishing in the study location.

2. **Methodology**

2.1 ***Study Area***

The was conducted in Kebbi State which is made up of twenty-one Local Government Areas (LGA) according to KSG (1998) and four Agricultural Development zones namely; Zone I (Argungu), Zone II, (Bunza), Zone III (Zuru) and Zone IV (Yauri). Artisanal fishing is the major source of livelihood due to availability of numerous inland water bodies such as Rivers Niger, Rima and Ka. These rivers are sources of water for irrigation, domestic use, fishing and transportation. Other sources of livelihoods include arable farming, animal rearing, art works, food crop processing, building and construction works.

2.2 ***Data collection***

A multi-stage sampling method was used in sampling the respondents. In the first stage, 21 Local Government Areas were stratified into four clusters in accordance with the existing Agricultural Development (ADP) zones. In reference to the hydrological

features of the State, three ADP zones (Argungu, Bunza and Yauri) were purposively selected in the second stage to represent the areas where artisanal mostly reside and carry out fishing activities. Information obtained from the Monitoring and Evaluation (M&E) unit of the State's ADP reveal that the three zones are representatives of the State in terms of artisanal fisheries activities. Some of the LGAs in Argungu and Bunza zones were located along the flood plain of Sokoto Rima River; while some LGAs in Yauri zone were located along River Niger. In the third stage a representative LGA was purposively selected in each zone, giving a total of three LGAs for the study. In each LGA, two important fishing communities were identified for interaction with target audience. Six fishing communities were involved in this study. Selection of fishing communities was thus, achieved by liaising with the Monitoring and Evaluation (M & E), and the Fisheries Units of Kebbi State Agricultural and Rural Development Authority (KADP). Majority (about 50%) of the fishermen operates in Yauri and Argungu zones (Bolorunduro, 2004); however, the exact populations per LGA were not available. Primary data were collected from fishermen both individually and from groups. A total of 82 fishermen were selected for the study. Focus Group Interviews were conducted for 48 fishermen from six fishermen groups and questionnaire administered to 34 fishermen.

2.3 *Method of analysis*

The analytical tools used in the study include descriptive statistics to describe the socio-economic characteristics of the fishermen, simple budgetary analysis 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 is given by:

$$NR = P - (\sum X_{1....n}) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where:

NR = Net return from marketing of fresh fish

X_1 = local government revenue (₦)

X_2 = Transport charges (₦)

X_3 = Commission paid to selling agents (₦)

X_4 = Packaging or repackaging cost (₦)

X_5 = Labour cost for catching fish (₦)

X_6 = depreciation on fishing gears (per day) (₦)

P = Selling price of unit quantity of fresh fish (measured in small metal basin of 15kg.

3. Results and discussion

3.1 *Characteristics of the fishermen*

Results of the socio-economic characteristics are presented in Table 1. Majority (47.1%) of the fishermen were within the age group of 25-40 years and 88.2% did not have formal education, but had undergone Arabic education. All the fishermen were from Hausa tribe. However, other tribes that were found in the fishing communities of Kebbi State include Fulani, Kabawa and Kambari. The cultural settings of Hausa people encourages early marriage among both sexes, hence all the fishermen were married. Fishing was the major source of livelihood (82.4%) in the study area and males dominated it. Dominance of male in artisanal fishery sub – sector had been reported by Onemolease and Oriakhi (2011).

The fishermen had an average of 26 years of fishing experience, while most of the fishing activities of these fishermen (52.9%) were located around water bodies close to their settlements and other watersides within the State (35.3% of fishermen). However, a small number (11.8%) of the fishermen traveled outside the State for fishing. This could be an indication of contentment with the returns from fishing within the state. Fishing, according to the fishermen was a major economic activity, which requires skilled men in the art of fishing and within the productive age. Most (67.6%) of the fishermen went fishing once a day while 32.4% fish twice per day.

Fishing activities go on for up to eight months of every year but with varying fishing magnitude from one month to another depending on availability of fish in the water bodies (Figure 1). During these periods, fishermen were actively involved in fishing, selling of the catch or processing before selling. The business of fishing as shown in Table 1 starts as early as 5:30am and ends in the evening (39.2%) or commences late between 7:00pm to 8:00am spending the whole night fishing and ending during the early hours of the following morning (35.1 %). This could be viewed as tedious for those above 50 years and children and were therefore involved in alternative activities which are fishing related (making of fishing gears and hawking of fish products). In recent years, the efforts of extension activities in the State have encouraged fishermen to belong to cooperatives or fishing groups in their various localities (97.1%). However, most of the fishermen had been members of these groups/cooperatives for not more than five years (67.7%). They fished as individuals and not as groups despite being members of fishermen groups or cooperatives.

3.2 *Investment requirement and returns of artisanal fisherman*

The average investment of a fisherman in the study area was estimated at ₦ 64, 267. 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. Half of the capital investment (51.9%) is required to purchase four fishing nets of various sizes. Different sizes of fishing nets are effective in catching different species and sizes of fish.

The proportion of the investment required to purchase, hooks, canoe, cast net (b*irgi*t) and fish traps (u*ndurtu) w*ere found to be about 20.8%, 15.6%, 9.3% and 2.5% respectively (Table 3).

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 70.6% of total cost. The net return from marketing of fresh fish was estimated as the difference between fishermen's selling price and the total marketing costs incurred. The analysis was based on the same unit of measure of the product (per small basin which is equivalent to 15kg of the fresh fish).

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. In achieving this task, fishermen transport the fish from point of catch to waterside thereby incurring transportation cost estimated at ₦ 68 per small metal basin (equivalent to 15Kg of fresh fish). They also pay ₦ 20 and ₦ 10 per each basin of fresh fish

Table 1:Socio-economic Characteristics of Fishermen in Kebbi Sate Nigeria

Socio-economic Characteristics	Frequency	Percentage
Gender		
Male	34	100
Female	0	0
Age distribution		
25 – 40	16	47.06
41 – 50	13	38.23
Above 50 years	5	14.71
Educational status		
Primary School	2	5.90
Secondary school	2	5.90
Arabic Education	30	30
Major occupation of fisherman		
Fishing	28	82.40
Farming	6	17.60
Years in fishing activities		
5 – 20	13	38.23
21 – 30	15	44.12
31 – 40	5	14.71
Above 40	1	2.94
Major fishing locations		
Waterside close to fishermen's village	18	52.94
Other Waterside within the state	12	35.29
Watersides outside the state	4	11.77
Frequency of fishing per day		
Once	23	67.60
Twice	11	32.40
Period of fishing daily		
5.30am-7.00pm	13	39.20
7.00pm-8.00am	10	28.40
Both period	11	32.40
Membership of cooperative society		
Yes	33	97.10
No	1	2.90
Years of group experience		
1 – 5	21	67.74
6 – 10	2	6.45
Above 10 years	8	25.81

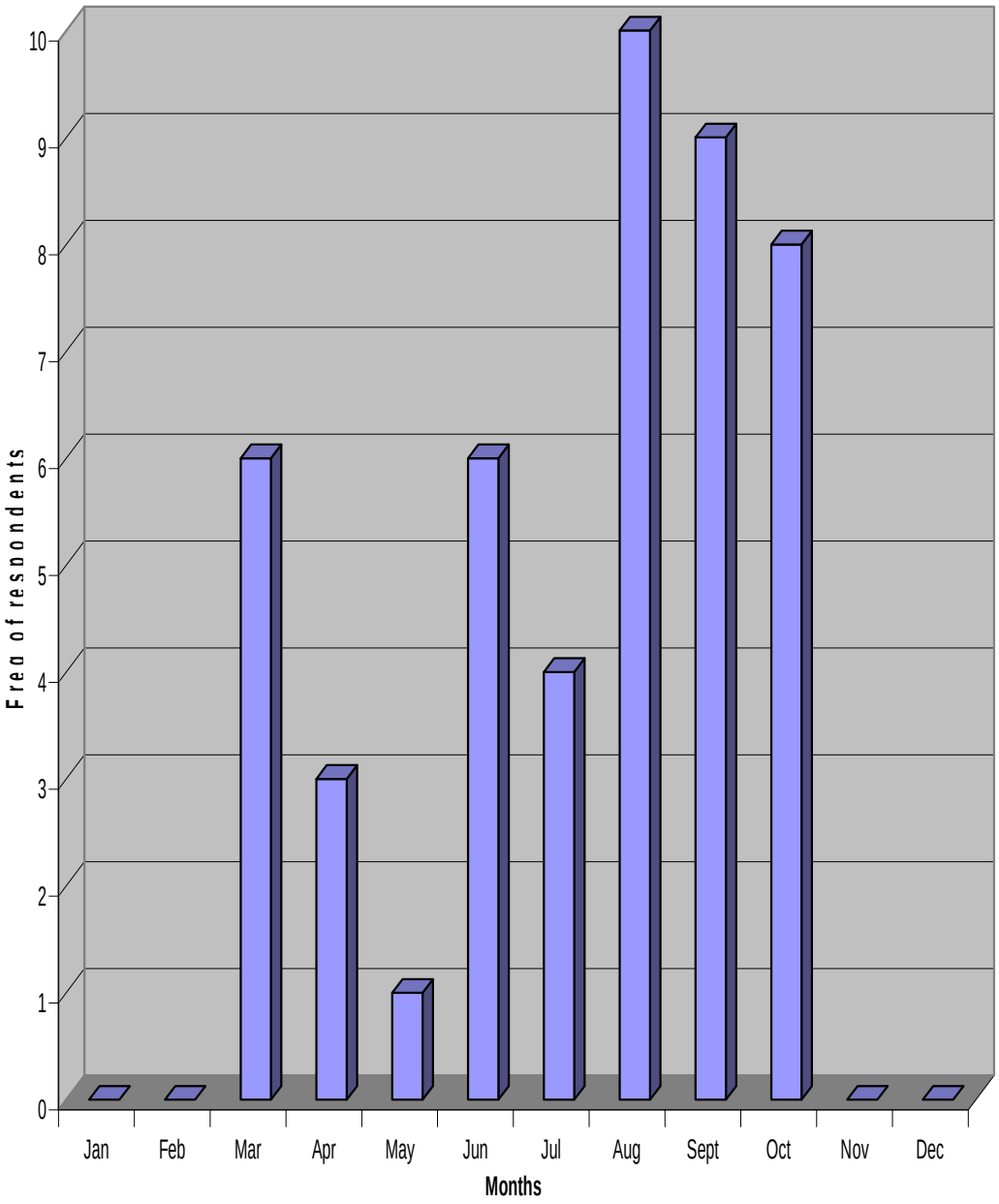

Figure 1: Distribution of fishermen by months of fishing

Table 3: Investment requirement of artisanal fisherman

Fishing gears	Expected life span (years)	Average number owned	Unit cost (₦)	Investment (₦)	Daily depreciation value per day (₦)
Cast net (*Birgi*)	2	3	2000	6000	8.20
Canoe	11	1	10000	10000	2.48
Fishing nets	2	4	8333	33332	45.54
Hooks	3	5	2667	13335	12.10
Fish trap		20	80	1600	
(Undurtu)	3				1.46
	3	20	80	1600	1.46
Total				64,267	69.78

Table 4: Costs and returns from marketing of fresh fish by fishermen in Kebbi State

Variable	Costs Components and Participants	Urban Market	
		Wholesaler	Retailer
	Fishermen (Direct sale to market participants)		
P	Average Selling Price per small metal basin (15 Kg)	800	950
X_1	Local Government Revenue	10	10
X_2	Transport Charges	68	68
X_3	Commission	20	20
X_4	Packaging	50	50
	Total marketing cost	148	148
X_5	*Labour (based on 10.5hrs of labour = 1.31mandays)	524	524
X_6	Depreciation on Fishing Gears (per day)	69.78	69.78
$\sum X_{1\ldots n}$	Total marketing cost +Labour Cost and Depreciation Value	741.78	741.78
NR	Net Return	58.22	208.22

to Local Government and commission agent respectively. In addition, ₦ 50 is spent on packaging. Packaging is achieved by use of locally available materials (baskets and leaves etc). Packaging is an important aspect of fresh fish supply, because it helps to reduce the rate of fish deterioration thereby reducing post-harvest losses. Net returns from sales of fresh fish varied among fishermen in the State depending on whether fishermen sell their catch to urban wholesalers to make a net return of ₦ 58.22 or ₦ 208.22 to urban retailers.

An assessment 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. However, a number of constraints need to be overcome before this can be achieved. The view is that small-scale fishers and processors can get better prices for their products by shortening the fish supply chain and increasing their bargaining and lobbying power (INFOFISH, 2008).

4. Conclusion

The study concludes that artisanal fishing industry in Kebbi State is dominated solely by men who are mainly small scale but full time operators within the productive age bracket and with varying degree of experience in the art of fishing. Hence the art of fishing could be sustained in the state. Artisanal fishing in the state requires reasonable capital investment for fishermen to operate successfully. Although profitable, the return on investment is low thereby leaving the operators vulnerable to loss in case of slight downward push in market price of the commodity. This is in addition to the fact that fishing in the State is labour intensive.

More fishermen should be encouraged to seek for alternative sources of income, while others can be enabled by the government with subsidized fishing inputs (5-15 horse power outboard engines and fishing gears of various mesh sizes). Fishermen could be trained on improved fishing techniques and fish farming. In addition inactive fishermen cooperatives should be strengthened so that members could secure fishing inputs. This could enhance better bargaining power and thus give more access to better market prices that will translate to higher returns. Small-scale fishers and processors can get better prices for their products by shortening the fish supply chain and increasing their bargaining and lobbying power. In this regard, the formation of marketing cooperatives should be encouraged and existing associations of small-scale fishers and processors strengthen by providing support for institution building.

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