Fish Production and Marketing in Dundaye District, Wammakko Local Government Area, Sokoto State

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Abstract

The study was conducted in Wammakko local government area of Sokoto state. On the River Rima side where artisanal fish production and marketing on the landing site takes place. One hundred and twenty (120) respondents were selected via stratified random sample technique. Information was on demographic features, production, marketing, processing, and handling and consumer preferences with the aid of structured questionnaire. Descriptive statistics and gross margin analysis were used to analyse the data. The results revealed that 90% respondents were in age ranged of 26-55. Fish was marketed in fresh and fried forms in the landing site. Fifty percent (50%) of the respondents prefer Tilapia and *Heterobranchus* species and 57% spent ₦400 on fish monthly. Seventy two percent of the consumers prefer to take price of the fisherman. Profit margin of ₦9, 200 for fish mongers while ₦3, 720 for the fishermen were recorded. It was recommended that farmers should be enlightened on the new fishing techniques especially the production and management of artisanal fishing.

Key Words: Fish, production, marketing, cost and revenue, gross margin

Introduction

In Nigeria, fish is one of the most important source of animal protein, constituting up to 40%

of the total animal protein intake (Afolabi, *et al*, 1984, Basorum and Olucalehin, 2007). Fish performs this role because of its wide

acceptability being subject to fewer taboos than most other animal protein sources. Fish is highly nutritious and in addition serves as a source of income, and employment to many Nigerian (Mal-Musa, 1996; Eyo 2001, and Abiodun, *et al.*, 2004). However, fish production in the area is mainly artisanal characterized by simple gears, floating gounds, trap nets, labour intensive, low capital investment and low productivity. Marketing starts with a thorough understanding of the consumer himself, his needs, location, preference, attitudes, perceptions and socio-economic characteristics. Food marketing in general in Nigeria appears inefficient both in economic and operation. The fisheries sub sector is worst hit by post harvest losses, processing losses and marketing losses (Bolorunduro and Sule, 2001). These have been estimated at not less than 30%. This figure is alarming, for a nation that needs spend scarce foreign exchange in importing frozen or canned fish to supplement the deficit (Sule, *et al.*, 2001). The problems of marketing might account for the present deficit in supply of fish in Nigeria with its attended implications. FAO (2004) reported a fish demand gap of 31.4 % in Nigerian ranging from 2,035 and 1,396 million tonnes demand and supply respectively was recorded. This demand gap can be eliminated if improvement in production and marketing incentives were made at various levels to the farmers (Bossocho and Bernasek, 1990). Alamu (1992) and Modupe (2001) remarked that fish handling and marketing are very important stages in fishing industry, and it has been estimated that 20-50% of the world fish catch is lost through poor handling, processing, storage and distribution. Eyo (1997)

reported that fish production and marketing involves the processes of breeding, hatching, catching, handling and performance of all the business activities concern with the forward flow of fish from the suppliers until it gets to the hands of the ultimate consumers. Thus, this paper tries to analyse production and marketing of artisanal fish in Wamakko Local government area of Sokoto State.

Materials and Methods

This study was conducted in Dundaye District, Wamakko Local Government area of Sokoto State. This area lies on the River Rima Valley located between latitude 11° and 16° N and longitude 4° and 8° E. Four (4) villages were purposively selected: Darayo, Dundaye, Gumbi and Lokobi. A total of one hundred and twenty (120) respondents were selected via stratified random sampling techniques. Structured questionnaire were administered to ten fishermen, ten fish mongers and ten consumers from each of the four (4) villages in the selected district. Data on age, years of experience, and types of fish catch, preference of consumers, marketing activities and income generated were collected. Descriptive statistics and gross margin analysis were used to analysed the data.

Specification of Model

$$GM = GR - TVC$$

Where

GM = Gross margin (is the difference between the cost of production and the revenue generated)

GR = Gross revenue (Total revenue generated from quantity caught multiplied by

the selling price per unit sack/ basket, a standard measure used in the area which equals to 15kg of fresh market size fish).

TCV = Total variable cost (cost incurred on hooks, threat, transportation, oil, condiments, baits, labour, etc)

Results and Discussion

The demographic features of the respondents such as age, occupations, and years of experiences in fishing activities were presented in table 1.

Table 1 shows that age distribution of the respondents, ranging between (25-55) years with majority (90.8%) belonging to active population group. The physical activities involved in fishing and fish mongering requires very strong and energetic individuals. It has been discovered by researchers that the working class fishermen fall within the age group of 26-60 years. This finding is in conformity with the assertion of Bellu and

Bah (2004) who reported that 20-60 years old farmers provide labour force in fishing business in Banjul, Senegal. According to Ayinori (1999), age composition amongst others especially for family heads has an implication on decision making in the marketing process and also indicate future scope for changes in marketing system.

Sixty percent (60%) of the respondents were involved in fishing as their major occupation only, while 25% engage in both fishing and other farming activities and 15% of the respondents were involved in fishing and fish marketing. The indication given by this findings is that majority of the people are engaged in fishing related activities. It is therefore an important activity in the study area influenced by water resources of the two rivers flowing in the area (Rivers Sokoto and Rima).

The table 1 also shows the number of years of experience by farmers in the area. Thirty

Table 1: Demographic characteristics of the respondents

Characteristics	Frequency	Percentages
26-35	38	31.6
36-45	36	30
46-55	35	29.2
56-65	11	9.2
Total	120	100
Occupation		
Fishing	72	60
Fishing and farming	30	25
Fishing and marketing	18	15
Total	120	100
Experience in fish marketing years		
1-5	22	27.5
6-10	32	40
11-15	24	30
16 and above	2	2.5
Total	80	100

Source: Field survey

percent of respondents had (11-15) years experience, followed by those between 1-5 years (27.5%) were those with 16 years and above (2.5%). Respondents with highest years of experience are expected to be better fishermen and marketers because of the numbers of years in the enterprise.

Types of fish catch

The type of fish in an environment is dependent on a number of factors such as climatic conditions, food availability, water source and its associated quality parameters, etc. Table 2 shows the types of fish caught by the respondents. There are different fish species in the study area, but the most common ones are shown. Table 2 revealed that 12.5% of the respondents caught Tilapia and *clarias*, 15% caught *Bogrids*, *Mormyrids* and *lates niloticus*, 5% caught *Labeo spp* and others e.g. *heterobranchius* while the

remaining 67% caught *tilapia*, *clarias*, *bogrus bayad*, *lates niloticus*, *labeo spp* and *heterobranchius* showing the common ones caught according to the respondents are tilapia, *heterobranchius bogrids* and *mormyrids*. The farmers over the years acquired skills of identifying consumers preference, processing and marketing of these caught species. This result was in agreement with that of Tamuno, *et al.* (2007) in Bayelsa State, they identified seven types fish species of commercial value in the area that are most preferred by the consumers.

Seasonal operations

Farmers in this part of the country operate on seasonal basis because of the nature of water body. More volume of water is seen in the rainy season with high fishing activity. Less activity in the dry season noticed with few farmers in action. Table 3 shows fish caught seasonally.

Table 2: Type of fish species caught in the Sokoto and Rima rivers in the Daudu district

Fish catch	Frequency	Percentages
<i>Tilapia and clarias</i>	5	12.5
<i>Bogrids, mormyrids and lates niloticus</i>	6	15.5
<i>Labeo spp and others</i>	2	5.0
All of the above	27	67.5
Total	40	100

Source: Field survey

Table 3: Distribution of fish catch according to seasonal operation

Season	Frequency	Percentages
Wet season	4	10
Dry season	26	65
Both season	10	25
Total	40	100

Source: Field survey

Results in table 3 reveals that 65% of the respondents operate in fish catching most before the onset of raining seasons (i.e. dry season) because then volume of water is low and the fish can easily be caught in bulk while 10% operate in wet season and the remaining 25% operate both wet and dry seasons. During wet seasons, the level of water is very high so catches are low. (Sack/basket is equivalent 15 kg of fresh fish of market size)

Table 4 revealed that 24 fishermen catch $\frac{1}{2}$ sacks per day, 12 fishermen catch 1 sack of fish per day and 4 fishermen catch 2 sacks of fish per day. The average daily catch per fishermen was computed to be 0.8 sack per day. The quantity of fish caught by the farmer depend on his experience, the location along the river, the type fishing gear and the time of fishing.

Marketing activities

Marketing plays vital role in business because it acts as a link between production and consumption. Marketing transaction of the respondents in the study area is presented in table 5 between the producers and consumers.

Table 5 reveals that 70% of the fishermen sold their fish in landing sites and 30% sold their fishes in the nearby village. This shows that majority of the fishermen sold their fish in the

landing site. Sales at this point minimize the cost of production, handling, transportation and marketing services all of which incurred cost are added to the consumers as selling points outside the landing sites. Furthermore the fishermen in the landing site sometimes had direct access to the consumers to bargain without any intermediary or middlemen. Majority of the respondents (72%) sale in small quantity, piecemeal or in few kilogrammes (less than 5 kg.) while the rest transact in whole sales. This may not be unconnected with the size of catches been small in quantity because of the traditional methods used for operations. The quantity sold daily varies or changes with the consumer's income at a point in time, consumer taste, demand and supply for fish.

The result in table 5 shows that 12.5% bought their fish from fishermen, 22.5% bought from fish mongers and 65% patronized both. Nevertheless, this depends on the time, the closeness of consumers to the fishermen or marketer. Out of the forty respondents, 72.5% of the consumers preferred price given by fishermen, 15% preferred price given by marketer and 12.5% are indifferent about price given. Most of the consumer preferred fishermen price because of the assumption that their price is lower compared with that of marketers, this may be due to low cost of production incurred

Table 4: Distribution of respondents according to daily catch

Quantity(sack)	Frequency	Percentages
$\frac{1}{2}$	24	12
1	12	12
2	4	8
Total	40	32

Source: Field survey

Table 5: *Marketing transaction activities of the respondents of fish*

Transaction/activities	Frequency	Percentages
Depots of sales by fishermen		
Landside	28	70
River site	12	30
Total	40	100
Quantity of sales;		
Small quantity (less than 5kg)	29	72.5
Larger sales	11	27.5
Total	40	100
Price tag on fish		
Fishermen	29	72.5
Markets/mongers	11	15
Both fishermen and mongers	40	12.5
Total	40	100
Preferred market places for consumer purchase		
Fishermen	5	12.5
Mongers	9	22.5
Both fishermen and mongers	29	65
Total	40	100
Seasonal scarcity experience by consumers		
Experience scarcity	26	65
Source fish throughout the year	14	35
Total	40	100
Mean of fish disposal by fishermen		
Fried	12	30
Fresh	5	12.5
Both fried and fresh	23	57.5
Total	40	100
Money spent on fish monthly by consumer (N)		
200	9	22.5
300	8	20
400	23	57.5
Total	40	100
Acceptability of fish species by consumers		
<i>Tilapia and clarias</i>	17	42.5
<i>Burgras burus and lates niloticus</i>	3	7.5
<i>Tilapia and heterobranchia</i>	20	50
Total	40	100

by fishermen and are willing to sell the commodity in order to avoid spoilage due to lack of adequate storage and processing facilities since fish is highly perishable.

The present study revealed that scarcity of fish is more pronounced during the rainy season which was attributed to rising water levels making gear operation difficult. Sixty five percent of the respondents sampled acknowledged fish scarcity in the rainy season. Thus during this period the fishermen resort to undertake other off fishing activities (farming) as a means of income, source of staple food to supplement family needs.

This survey revealed that fish is being sold as fresh or fried state but no smoking of any kind was noticed. Twelve percent (12%) of the respondents sale freshly caught species, 30% sale fried fish while 40% were engaged in both fried and fresh form. Prices of the products differ depending on the inputs used as a result of extra processing and value added.

The result in Table 5 also revealed that 22.5% of the respondents spent N200.00, 20%

spent N300.00 and 57% spent >100.00 and above on fish per month. The amount of money spent on fish monthly depend on the size of the family, the income, time of the season, cross price of other protein source such as meat. This shows that people in the area patronize fish as a source of protein. It was observed that the respondents in the study area consume more fish during the fish season in months of September to March in the study area. Because of the nutritional importance of fish as reported by Oladipo *et al.*, (1981) and Afolabi *et al.* (1999), most respondents do make purchase of fish as part of their meal budget.

Furthermore, most consumers in the area preferred Tilapia and *clarias* because they are more native and palatable 7.5% preferred *Barrus boyad* and *lates niloticus*, *labes carbie* species because there are also common in the study area and cheap and 50% preferred tilapia and *heterobranchas*. Thus fish is acceptable to all the respondents in the area, this is in line with the observation of Mai-Musi (1996) that fish is the most acceptable protein source.

Table 6: Average cost and revenue structure of fish by marketers (Mongers)

Items	Average cost (N)
Variable cost	Naira/season
Purchase of fish from fishermen	49,200.00
Transportation	10,000
Groundnut oil	24,000.00
Firewood/salt/salt, condiment	2,400.00
Packaging (paper, nylon bag)	400.00
Average no. of fish sack per season	9.6
Selling price per sack/basket of fish (Naira)	N 10,000
Total variable cost	N26,800.00
Gross revenue	N96,000.00 (9.6 *10,000)
Gross margin	N9,200.00

Source: Field survey, 2003

Profitability of fish production

This section analyses the cost and returns of fishermen and fish marketers incurred by the respondents. Costs of production are actual expenses incurred in producing (catching) one unit sack of fish (One unit sack/basket of fish is equivalent to 15 kg of fresh fish of market size) to the consumer. According to the respondents, cost of production involves cost of threads, hooks, gourd, nets, transportation, sack and basket, labour, marketer services etc. these variables greatly add to cost of production which reflects on the final price paid by the consumers. Table 6 indicate that the cost and revenue structure of the fish enterprises of the marketers spend over eighty thousand naira (N86, 800.00) per season and realized a revenue of ninety six thousand naira (N96, 300). Thus, the marketers earn a profit of N9, 200 seasonally.

Table 7 also expresses the profit in the fishermen with respect to the various requirements of their enterprises. The results indicates that marketer earn more profit than the fishermen. This may be attributed to the extra services rendered by the marketers in the form of time by keeping or preserving fish and merchandizing, thereby increasing its

selling life. This finding is similar one reported by Jones (1996), Gave, *et al.* (2006) that fish marketers in Adamawa State had higher profit than wholesalers/producers.

Though the enterprise was profitable, but the profit margin was very small in comparison with time, labour put in and economy of the country at this period by the farmers. This is attributed to the small size of the operation, use of traditional equipment, unaccounted expenses during operation by family.

Conclusion

Fish production and marketing in the river side of Dandaye district of Wammako local government area is profitable enterprise engaged by the fishermen and fish marketers. Though the marketers had more profit share than fishermen (producers).

Recommendation

It was recommended that the farmers in the area need to be enlightened on improved artisanal fish farming techniques and innovations that are geared toward enhanced production, management of fish resources and marketing

Table 7: Average cost and revenue structure of fishermen

Items	Average cost
Cash operation expenses	Naira/season
Fish gear	18,000
Hook	11,640
Cost of consumables sack, bait, net	1,000
Labour	5,000
Average no. of sack catch per season	9,6
Selling price per sack/basket of fresh caught fish	N4,100
Total variable cost	N35,640
Gross revenue	N 39,300 (9.6*4,100)
Gross margin	N 3,720

Source: Field survey 2005

strategy. This will go along way in ensuring conservation of the little fisheries resources in this natural water bodies.

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