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Assessment of artisanal fishing in Oyorokoto fishing settlement, Andoni Local Government Area of Rivers State, Nigeria

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ABSTRACT

The study assessed artisanal fishing in Oyorokoto fishing settlement, in Andoni Local government Area of Rivers State, Nigeria. The problem of decreasing yield of fish species reported by the fishermen is negatively affecting artisanal fishing business. This is resulting to declining interest showed by fishermen especially in Oyorokoto in doing fishing. The study estimated quantity of fish catch, profitability of artisanal fishing and identified constraints faced by the fishermen. A simple random sampling technique was used to select 120 fishermen from four communities in the area. Data collected were analyzed using descriptive statistics such as frequency, mean and percentages; gross margin model was used to estimate the profitability. The result showed that male fisher folks were predominant in artisanal fishing with 70%. Majority (50.8%) were between the age brackets 41-50 years and had spent 21-25 years doing fishing. Family members were the main source of labour with 52.5%. The study also revealed that ₦44,218. 00 was spent by an average fisher folk on variable inputs per month. Total revenue was estimated as ₦ 156, 300 while gross margin earned was ₦ 112,092.00. Water pollution, insufficient capital, problem of militancy, sea piracy, inadequate storage facilities were among the challenges faced by artisanal fishermen in the area. It is recommended that all relevant bodies in charge of ensuring safety of environment especially in the water ways should be more proactive in regulating and handling problems of water pollution and insecurity in the water ways.

Keywords: Assessment, artisanal fishing, Oyorokoto, fishing settlement

INTRODUCTION

Fish is an important source of food and income to many people in the developing world. In Africa, some 5% of the population, about 35 million people, depend wholly or partly on the fisheries sector, mostly artisanal fisheries, for their livelihood (Adeyeye, and Oyewole,

2016). New Partnership of African Development, (2005) reported that, artisanal fishing generates income for over 10 million people who are engaged in the fishing activities. This number of fishermen involved in this form of fishing had made fish become a leading export commodity for Africa. Prior to

the 1990s coastal fishing development was driven by socio-economic objectives including, nutrition, improvement of rural communities, generation of additional family income, creation of employment and diversification of income (FAO, 2007 in Adeyeye, and Oyewole, 2016).

Artisanal fishing had existed in Africa, including Nigeria before the 1950s when aquaculture was introduced. Since then artisanal fishing activities have increased steadily from a few hundred kilograms to over 45,000 metric tons in 2004 (FAO, 2007 in Adeyeye, and Oyewole, 2016). According to Adeyeye and Oyewole, artisanal fishing is of a great importance to economic development in Nigeria.

Fishery sector occupies a significant position in the economy of Nigeria contributing 4% to agricultural GDP (Lawal, et al., 2016). According to them, artisanal fisheries supplies 81.9% of the total domestic fish production in Nigeria. It is recognized as one of the fastest-growing fish production sectors especially in developing countries including Nigeria. The fishing method is characterized with small scale, low technology, commercial or subsistence fishing practices, particularly those of coastal or island ethnic groups found in most developing countries including some part of China and Asian countries. Artisanal fishing involves the use of traditional techniques such as rod and tackle, arrows and harpoons, throw nets and drag nets and traditional fishing boats mostly of small and moderate sizes (Jacquet and Pauly, 2008). It is in contrast with large modern commercial fishing practice which involves high technology in carrying out fishing. Apart

from contributing to increase in the availability of fishes and fish products in the market, artisanal fishing also employs 25 times the number of fishers (over 12 million people in Nigeria (Jacquet and Pauly, 2008). A study carried out by Adewumi, et al. (2012), profitability analysis showed that an average fisherman made a gross margin of ₦52, 883.99/fisherman/month. Also, Anyanwu, Mkpado and Ohaka (2009) reported that artisanal fishing in River Niger Onitsha, Anambra State, Nigeria was profitable.

However, it is surprising to note in recent time, a declining interest showed by artisanal fishermen especially in Oyorokoto fishing settlement in Andoni LGA. The number of persons engaged in the fishing activities is decreasing because some fishermen now abandon their fishing businesses for other economic activities. This is affecting quantity of fish catch from the fishing business which is also reducing volume of sales from the fishing activities. Oladimeji, (2018) observed that fish demand in Nigeria appear to increase at an increasing rate in the period 1970 to 2014. However, he noted that fish production from artisanal fishery exhibited a downward slope and the growth rate is dwindling creating a demand-supply gap deficit.

This scenario is worrisome because despite the presence of several water bodies, including man-made lakes found in Oyorokoto fishing settlement, artisanal fishermen are showing low interest in the business of fishing. This is so because as people are leaving the fishing business, commiserate number of new entrants seemed not be engaged in doing artisanal fishing business. In

addition, the problem of low fish catch reported among fishermen is becoming more rampant. This seems to pose serious threat to availability of fish products in the area as well as the survival of the fishing business.

It is against this background that the study assessed artisanal fishing in Oyorokoto fishing settlement, Andoni Local Government Area of Rivers State, Nigeria. Monthly quantity of fish catch and profitability of artisanal fishing were estimated and constraints faced by artisanal fishermen were identified.

RESEARCH METHODS

Study Area

The study was carried out in Oyorokoto fishing settlement, Andoni Local Government Area of Rivers, Nigeria. According to census data released in 2006, Andoni LGA population was 217,92 and estimated as 306, 200 persons in 2016 (Rivers State, Government, National Bureau of Statistics, 2016). Oyorokoto fishing settlement had a population of 30,000 person in 2006 and was estimated people in making It is economically significant in the area of fish production mostly by Artisanal Fishing system. Oyorokoto is bounded on Atlantic Ocean at the south, to the East by Bonny, to the West by Ngo the headquarters of Andoni local government area and to the North by Andoni River. It is a home to many languages speaking Andoni people including non-indigenes.

The inland part of Oyorokoto consists of tropical rainforest; towards the coast and many features of mangrove swamps. It is among the communities in Andoni where the crude oil is also extracted apart from only fishing activities. Oyorokoto fishing settlement also

provides valuable seafood's such as crabs, oysters, shrimps and sea snails among others.

The population of the study is the entire artisanal fishermen in Oyorokoto fishing settlement, Andoni Local Government Area of Rivers State, Nigeria. Oyorokoto fishing settlement has a population of 2000 fishermen (National Population Commission, 2006) and estimated as 2,572 in 2016.

Sampling Techniques

The study adopted multi-stage sampling of four (4) communities which were randomly selected from the six (6) communities in Oyorokoto fishing settlement which include; Ibot-OkponM Baba, Oyorokoto-Ngo, EbirinyaAgana and Ama-Licious. Lastly thirty fishermen were randomly selected from each community giving a total of 120 fishermen. A well-structured questionnaire was the instrument employed in the collection of data for the study. Oral interviews and personal observations were also employed for data collection. Discussion which was also focused on the various aspect artisanal fishing was also held with the fishermen.

Descriptive statistics such as frequency and percentage and gross margin model were the analytical tools used.

Model Specification

$$GM = \sum TR - \sum TVC; \sum TR = Py \cdot Q$$

Where: GM = Gross Margin

TR = Total Revenue (₦) and its estimated as quantity x price per kg

TVC = total variable cost (₦) which include cost of line, labour, food, fee for land space and transportation.

Py = Unit price of fish catch per kg

Q = Quantity of fish catch in kg.

RESULTS

Result of socio-economic characteristic such as age, sex, level of education, marital status, educational, household size, source of capital and years of fishing experience is presented on Table 1. The result on Table 1 showed socioeconomic characteristics of artisanal fishermen which indicated that

males dominated in the fishing activities and constituted 70.8 % while females were only 29.2%. It was also found that the dominant age range was 41-50 years which was 50.8%. Household size of 6-10 persons was 41.7% with majority fishermen spending 21- 25 years in fishing business which showed 34.2%.

Table 1. Result of socioeconomic characteristics of artisanal fishermen in the study area.

Variables	Frequency	Percent
Gender		
Male	85	70.8
Female	35	29.2
Age in years		
Below 30	13	10.8
31-40	25	20.8
41-50	61	50.8
Above 50	21	17.5
Marital Status		
Single	17	14.2
Married	39	32.5
Separated/ Divorced	14	11.7
Widow/Widower	23	19.2
Educational level		
No formal Education	45	37.5
Primary Education	30	25
Secondary Education	25	20.8
Tertiary Education	20	16.7
Household size in persons		
1-5	16	3.3
6-10	24	41.7
11-15	50	25
16-20	30	20
Source of labour		
Hired	40	33.3
Family	63	52.5
Exchange arrangement	17	14.2
Source of Capital		
Personal savings	19	25.8
Family members	29	24.2
Loan from friends	31	45.8
Isuzu (Akawo)	11	9.2
Incentives from government	18	15

Others	12	10
Additional occupation		
Trading	60	50
Commercial transporters	20	16.7
Hunting	10	8.3
Technicians	18	15
Wood carving	12	10
Fishing experience in years		
1-5	13	10.8
11-15	19	15.8
16-20	17	15.8
21-25	41	34.2
26 and above	8	6.7
Total	120	100

Source: Field survey 2015

Result on quantity of fish catch by artisanal fishermen is presented in Table 2. The result showed that the average daily quantity of fish catch by artisanal

fishermen in the study area was 26.0kg while weekly catch was 78.18kg. Cost and returns in artisanal fishing.

Table 2. Average quantity of fish catch by artisanal fishermen in the study area

Period of Fishing	Average quantity in (kg)(n=120)
Daily catch	26.06
Weekly catch	78.18
Monthly catch	312.72

Field survey, 2015.

The result on Table 3 showed that an average monthly amount of ₦44,218.00 was spent on the purchase of variable inputs used by an average fisherman in the study area. A monthly total revenue

realized was estimated as ₦156,300.00 while gross margin during the period was ₦112,092.00.

Table 3. Monthly average cost and returns of artisanal fishing in the study area

Items	Amount in naira (₦) per month
Cost of transportation	5,372.00
Cost of feeding	2,880.00
Fuel for boat engine / repairs	14,660.00
Cost of boat hires	4,000.00
Fee for land space	2,000.00
Bait	2,096.00
Cost hire labour	13,200.00
Total variable Cost (TVC)	44,218.00
Total Revenue	156,300.00
Gross Margin	112,092.00

Source: Field survey, 2015.

Table 4 showed that 83% of the fishermen agreed that pollution of the water bodies due to oil spillage and solid waste disposal was identified as constraints in artisanal fishing while 17% indicated that it was not a serious

problem. Other problems faced by fishermen as suggested by the data were high rate of sea piracy, high cost of transport, inadequate capital for supporting fishing business.

Table 4. Constraints faced by artisanal fishermen in Oyorokoto fishing settlement

Variables	n= 120	n= 120
	Yes (Freq (%))	No (Freq (%))
Problem of pollution of water bodies	100(83.33)	20(16.67)
Weather changes	90 (75)	30 (25)
High rate of sea piracy	89 (74.17)	31 (25.83)
Reduction of quantity of fish catch	87(72.5)	33 (27.5)
High cost of transport	83 (69.17)	37 (30.83)
Inadequate capital	81(67.50)	39(32.5)
Inadequate supports from government	80 (66.7)	40(33.33)
High rate of militancy	80(67.7)	40 (33.33)
High risk of loss of life in fishing	75 (62.5)	45 (37.5)
High rate of taxation	70 (58.33)	50 (41.67)
Inadequate processing and storage facilities	65(54.17)	55(45.83)

Source: Field survey, 2015.

DISCUSSION

The result on Table1 which is the socioeconomic characteristics of artisanal fishermen in Oyorokoto fishing settlement in Adoni LGA indicated that males were dominant in artisanal fishing with 70.8 % while the female fisher folks were only 29.2%. This finding suggests that male dominated the artisanal fishing. This is supported by Anyanwu, Mkpado and Ohaka, (2009); Lawal, Obatola, Giwa and Alhaji, (2016) who reported that males dominated the artisanal fishing in River Niger Onitsha, Anambra State and Lagos State, Nigeria respectively. The reason why male dominated the artisanal fishing could likely be due to the tedious nature in fishing operations which require lots of physical strength. Only strong and energetic women would be

able to cope with the tedious nature of work activities in fishing operations.

Table 1 also showed that the age range of41-50 years was 50.8% , while the range between 31-40 years was 20%. This is an indication that artisanal fishermen were in their active age, implying the sample population is strong and energetic and possess physical strength which is required for doing fishing. Only 10.8% of the respondents were below 30 years. The result is contrary to the findings by Lawal et al., (2016) who reported that respondents within age bracket 31- 40 years dominated fishing activities in Lagos State.

It was also reported that majority of the fishermen had household size average household size between 6-10 persons with 41.7%. Also 25% of them had

family size of 11-15 persons, 20% had family size of 16-20 persons, and only 3.3% had family size of 1-5 persons. This suggests that large family size in the study area would be able to assist them in their fishing business. This is very common in developing countries especially in Africa where family size seemed to be large and family members participate actively in the economic activities of their various families. Also, in Table 1, 34.2% of the fishermen spent 21-25 years doing fishing activities. It was reported that 15.8 % of the fisher folks had spent 11- 15 years doing fishing while only 6.7% of the respondents spent 26 years in fishing. It was found that 32.5 % were married. The result further showed that 37.5% of the artisanal fishermen had no formal education; 25% had at least primary education. Findings suggest that formal education is not an important variable to be considered in artisanal fishing business. Nevertheless, young fishermen would have learnt fishing skills from older ones as they participated in the fishing business activities along side with their family members.

It was found that 52.5% of the fisher folks got labour supply from family members. This is indicating that fishing business is done as a family business while 33.3% of them used hired labour. It was also found that 50% of them got their start up capital from personal savings and family contribution. Data suggested that 15% got capital for their fishing business as incentives from the government while 9.2% of them got from isusu (akawo) as source of capital.

The study also showed that 50% of the respondents were also engaged in trading, 16.7% them were engaged in

commercial transportation as their additional occupation, 15% of artisanal fishermen engaged in hunting while 10% of them were engaged in wood carving as their additional occupation.

The result on Table 2 showed that the average quantity of fish catch by artisanal fishermen 26.0kg. It was noted that 78.18kg fish was caught weekly while 312.72kg was recorded as quantity of monthly fish catch by an artisanal fisherman in the study area. The data on volume of catch suggests that the volume of fish catch is decreasing. This agrees with the finding by Chilaka, Nwabeze and Odili (2014), who reported that there is a problem of decreasing yield in the fisheries sub sector in Nigeria. This may be related to the problem of pollution of water bodies especially in the Niger Delta region of Nigeria where reports of crude oil pollution in the water bodies is becoming regular in the recent times. This is also supported by the finding of Ndubueze-Ogaraku, Onoja and Monsi (2016), which suggested that crude oil pollution may have contributed to the low shellfish catch recorded in the oil spill-affected communities in Rivers State, Nigeria.

The result on Table 3 showed that on average ₦44,218.00 was spent on purchase of inputs per month by an artisanal fisherman in the study area. Total revenue realized by them was ₦156,300.00 per month. Monthly gross margin estimate from fishing was ₦112,092.00. This result implied that the fishing business is profitable. This is supported by the findings of Anyanwu, Mkpado and Ohaka, 2009; Adewumi, et al. (2012), who stated that artisanal fishing was profitable in River Niger

Onitsha, Anambra and Kwara States respectively.

Result as showed in Table 4 showed constraints faced by artisanal fishermen in Oyrokoto fishing settlement. It was indicated that pollution of water bodies was 83.33% while 16.67% agreed that was not a problem. The problem of water pollution resulting from crude oil spillage is a serious problem in most fishing communities especially in the Niger Delta, Nigeria. This is supported by the finding of Ndubueze-Ogaraku, Onoja and Monsi (2016), which observed that crude oil pollution may have contributed to the low shellfish catch recorded in the oil spill-affected communities in Rivers State, Nigeria.

The report also showed 75% of the respondents agreed that variation in weather conditions is a constraint facing their artisanal fishing activity while 25% of them showed that water pollution is a constraint. This is not surprise because of the changing climate variations being experienced globally. This is supported by Adewumi, et al.(2012), study, who observed that problems of artisanal fishing include seasonal change in the volume of the river resulting from changes in weather variations.

The data further observed that 74% of the respondents stated that sea piracy is a constraint facing them in the study area and the incessant attacks by the sea pirates was limiting the fishing activities of the people. It was further revealed that 66.7% of the respondents stated that inadequate assistance from government is a constraint facing them in the study area. This finding tends to emphasize the point that capital needed for expansion of fishing business is a problem. This

report supports the finding of Adewumi, et al, (2012), who observed that problems of artisanal fishing were lack of storage facilities and lack of government support among others.

The report also showed that 69% of the respondents indicated that high cost of transportation is a constraint facing artisanal activities in the study area, 63% showed that high risk resulting to loss of human lives was a problem in artisanal fishing. It was reported that 67% indicated high rate of militancy as a constraint. High rate of fees charged by government and community agents was reported by the respondents as a constraint facing artisanal fishing in the study. It was also reported that 54.17% had inadequate processing and storage. This finding is agreement with the report by Anyanwu, Mkpado and Ohaka (2009), who reported that all the fishermen in the study area were of the view that cold room and other storage facilities were major problems.

Generally, these findings is suggesting that artisanal fishing is currently faced with myriads of problems as reported by Chilaka, Nwabeze and Odili (2014), who observed that fisheries sub sector is faced with huge challenges such as decreasing yield, inefficient management of fishing policy and commercial knowledge which are limiting its production potential. In same view Egesi, (2016) reported that major problems affecting fishing activities in the fishing communities, include; non -availability of fund, high cost of fishing inputs, high rate of post -harvest losses, pollution of water bodies by the oil companies and high cost of transportation.

CONCLUSION

The study concludes that artisanal fishing is dominated by males fisher folks and it is a profitable venture. However, the business is faced with myriad of problems ranging from water pollution, oil spillage and solid waste disposals, changes in water levels, sea piracy and militancy among others. It is recommended that;

1 All relevant bodies in charge of safety of environment especially in the water ways should be more proactive in regulating and handling problems of water pollution and insecurity in the water ways.

2 Artisanal fishermen should be encouraged to form cooperative society to enable them access grants and incentives from the government and development agencies to help acquire important facilities needed for the fishing activities.

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