

*Full Length Research Paper*

# **Analysis of fishing technology and fish production by women in small scale fish farming in Katsina Metropolis Katsina State, Nigeria**

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**This study was conducted to evaluate the productivity, profitability and level of technology of small scale fish farmers among women in Katsina metropolis, Katsina state, Nigeria. A well structured interview guide was used to collect primary data from thirty respondents from six wards (Kwado, Barhim, Kofar Sauri, Abattoir area, Kofar Durbi and Sabuwar Unguwa) based on their fish farming activities. The information collected was analysed using descriptive statistics. The result revealed that (60.0%) were in their active age distribution of 30-50 years; (80.0%) were married, (20.0%) have no formal education. (63.3%) has at least 10 years modern fish farming experience. Also, (80.0%) sourced their capital through personal savings. The result showed a gross margin of N7, 651,740 and a net income of N7, 348,260 which could be attributed to their performance. Concomitantly, the study shows that the constraints faced by the fish farmers and the size of the business especially in areas of access to modern fish farming skills, capital funding from government and commercial banks and non-usage of modern fish equipment, tools, improved fingerlings stocks and cost of fish feeds. The implication of these finding are critically examined and pertinent recommendations are proffered based on the salient findings of the study.**

**Key words:** Analysis, Fishing, Technology, Production, Women, Small Scale, Fish Farming, Metropolis, Katsina State, Nigeria.

## **INTRODUCTION**

The fisheries sector is an important source of livelihood, food security, income and employment for millions of people around the world (FAO, 2009). In Nigeria, there is a short supply of fish and its resources with an increase in human population which has put a combined effect on the fishing activities at the coastal areas or fishing localities (Adegibte et al., 2008).

However, due to the pressure on protein source of fish the necessity for a shift from captured fish sources to culture was envisaged. Culture fisheries are the creation of new life of fish species by other means than the natural means available (Pauline et al., 2015). The creation of new life is a chain of activities that is more or less similar

to natural production

Despite the dominance of women in fish marketing and processing (George, et al., 2011). It is sad to say that the living conditions of rural women have not changed significantly (Mafimisebi, 2004). The per capita income of an average rural dweller is considered to be too low. This is because between 70-80% of Nigeria's population is still engaged in subsistence agriculture and cannot afford to go in to commercial farming due to constraints such as inadequate capital and e.t.c.

It is a fact that over 50% of rural populations are female (George et al, 2011). They are engaged on a continuous basis in home-related and income-generating activities. Based on the aforementioned reviews, this survey focused on the involvement of women in fish production at household level in Katsina metropolis. This study therefore sets out to describe the socio-economic

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characteristics of the women involved in fish farming, type of fishing technology used by the women, quantity of fish they produce, amount of profit they make and constraints they faced.

## MATERIALS AND METHODS

### The study area:

The geographical location chosen for this study is the metropolitan area of Katsina, Katsina state Nigeria. The area coordinates are 12° 59'N 7° 36'E, 142 Km<sup>2</sup> with a total population of 318,459 (2006 population census). The choice of Katsina metropolis for this study is because of its abundance with small household business activities engaged by women and been in urban centre accessibility to skills of modern fish farming technology and western education among women.

### Sampling Procedure and Sample Size

Purposive and simple random sampling techniques were used in selecting respondents from the administrative zone of Katsina State Agricultural and Rural Development Authority (KTARDA). The six wards chosen are Kwado, Barhim, KofarSauri, Abattoir, KofarDurbi and Sabuwar Unguwa. This selection was purposively carried out based on the high degree of women fish farmers in these areas.

### Source of Data

The data used on this study were sourced from both primary and secondary sources. The Primary source was generated from Oral interview. The interview guide was designed in line with the objectives of the study which contained open ended and closed ended questions so as to allow the respondents express their opinion freely about the specific situation. The secondary data were sourced from internet and relevant publications.

## DATA ANALYSIS

### Descriptive Statistical Tools

Table, frequencies, percentages were used to describe the socio-economic characteristics of the respondents and constraints faced by women fish farmers in fishing enterprises. The characteristics studied, included the ages of the women, marital status, educational level on fish farming, marketing experience etc. Also the budgetary technique was used to determine the gross margin income of the women fish farmers. A model that was used in estimating the gross margin was;

$$GMI = \Sigma TR - \Sigma TVC \text{ ----- (i)}$$

$$TR = PY \cdot Y_i \text{ ----- (ii)}$$

$$TVC = P_{xi} \cdot X \text{ ----- (iii)}$$

$$TC = TVC + TFC \text{ ----- (iv)}$$

$$NI = GM - TFC \text{ ----- (v)}$$

Where:

GMI = Gross Margin Income (₦)

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

TC = Total Cost (₦)

NI = Net Income (₦)

Py = Unit Price of Output Produced (₦)

Y = Quantity of Output (Kg)

## RESULTS

Socioeconomic characteristic of the respondents and the results of the analysis showed that (60.0%) of respondents were in their active age distribution of 30 – 50 years; (80.0%) were married; (20.0%) have no formal education (63.3%) have acquired at least 110 years modern fish farming experience; (80.0%) sourced their capital investment from personal savings; (50.0%) have registered with fisheries society of association; (80.0%) volume of production is between 500 – 2000 fingerlings per season and an income generation of N7,348,260 and a gross margin of N7,651,740 as indicated in Tables 1 and 2.

### Fishing Technology and Modern Equipments

The respondents revealed that most (63.3%) of them do not have experience on modern fish farming skills, no advanced formal education. They do not have access to adequate funding of their business in order to boost production capacity and profit turnover.

The fish farmers use concrete and plastic ponds and stock *Clarius gariepinus* in ranges of 3m x 3m x 1.5m to 4m x 4m x 1.5m concrete ponds. Some few rear *Eoreochromis niloticus* (Nile tilapia). They gave less emphasize to water quality management and employ very few of the listed culturing materials/equipments:

- Weighing balances
- Meter ruler
- Scoop net
- Cast net/clap net
- Drag net and accessories
- Mosquito netting material
- Plastic buckets
- Plastic bowls
- ½ litre cups
- Hand towel

**Table 1:** Percentage age distribution and other variables of respondents

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
Age		
30 – 40	9	29.7
41 – 50	10	33.3
51 – 60	9	37.0
Above 60	-	-
Total	30	100%
Marital Status		
Single	-	-
Married	24	80.0
Divorced	03	10.0
Widow	03	10.0
Total	30	100%
Level of Education	06	20.0
No formal Education	03	10.0
Completed Pri. School	03	10.0
Unable to complete Pri. School	12	40.0
Completed Secondary School.	06	20.0
Unable to complete Sec. School	30	100%
Modern Fish Farming Experience		
0 – 10 years	11	36.7
11 – 20 years	-	-
21 – 30 years	-	-
Above 30 years	30	100%
Total	11	36.7
Duration Spent in Fish Farming		
0 – 10 years	10	35.0
11 – 20 years	14	45.0
21 – 30 years	06	20.0
Above 30 years	-	-
Total	30	100%
Source of Investment		
Personal savings	24	80.0
Loan from Banks	-	-
Government Grants	06	20
Total	30	100%
Volume of Production Output		
1 – 500 fingerlings	9	30.0
501 – 1000 fingerlings	6	20.0
1001 – 1500 fingerlings	9	30.0
1501 – 2000 fingerlings	6	20.0
Above 2000 fingerlings	-	-
Total	30	100%
Membership of Fisheries Societies		
Registered Membership	15	50.0
Non Registered Membership	15	50.0
Total	30	100%
Income Generation Volume		
N500,000 – 1,500,000	6	20.0
N1,500,000 – 3,000,000	9	30.0
N3,000,000 – 4,500,000	9	30.0
N4,500,000 – 6,000,000	6	20.0
Total	30	100%

Source: Field Survey, 2016

- Hand gloves
- Thermometer

- PH meter
- Water testing kit

**Table 2:** Respondents Fish Farming Technology Information

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
Fingerlings Stocks		
Improved brood stocks	10	36.7
Local brood stocks	20	63.3
Total	30	100%
Fish Feeds		
Improved fish feeds	15	50.0
Local fish feeds	15	50.0
Total	30	100%
Water Management		
Improved/Modern Technology	12	40.0
Local Tchnology	18	60.0
Total	30	100%
Fish Farming Equipments/Materials		
Employ Modern equipment/materials	9	30.0
Employ local equipments/materials	21	70.0
Total	30	100%

**Table 3:** Constraints Affecting Women Involvement in Fish Farming in the study area.

<b>Problems</b>	<b>Very Severe</b>		<b>Severe</b>		<b>Not-severe</b>	
	<b>Freq.</b>	<b>%</b>	<b>Freq.</b>	<b>%</b>	<b>Freq.</b>	<b>%</b>
Inaccessibility to credit	24	80	4	13.3	2	6.7
Scarcity of fish inputs	20	66.74	13.3	6	20	
Distance to market	8	26.74	13.3	18	60	
Poor maintenance	15	50	9	30	6	20
Unavailability of parts	9	30	11	36.7	10	33.3
Difficulties of access	4	13.36	20	20	66.7	
Climatic conditions	4	13.34	13.3	22	73.3	
Poor storage	6	20	6	20	18	60
Inadequate technology	24	80	2	6.7	4	13.3

**Source:** Field survey, 2016

- Disecting kit
- Sorting table
- Hardcover/exercise book

### Constraints to Fish Production in the Study Area

The result of the constraints to fish production in the study area revealed that inaccessibility to credit facilities was (80.0%), scarcity of fish inputs (66.7%), inadequate technology (80.0%) and some of the constraints faced by the women fish farmers in the study area are reflected in (Table 3) below;

### DISCUSSION

The study analysed the fishing technology of small scale

women fish farmers in relation to their productivity, profitability level in Katsina metropolis Katsina state, Nigeria. Most of the respondents were between the age of 30 – 50 years; an age in which they are considered highly productive and active to undertake strenuous task associated with farm work. This is in line with the assertion of Bello, 2000; Ashaolu et al..2006; Olaoye and Odebiyi, 2010; that age has positive correlation with acceptance of innovations and risk taking. Majority (80.0%) of women interviewed were married. Education is a paramount factor which can influence farm productivity and determine farmer's access to loan and repayment. Level of education according to the study showed that (20.0%) of the respondents had no form of education and close to (80.0%) their education level do not exceed secondary education. This is in line with the general opinion that most farmers are illiterates; most of

whom have dropped out of the formal school system, as evidence from the studies of Lahai et al, (2000) and Deigado et al, (2003).

In the study area adverse scarcity of improved fish inputs is a major threat to their performance (80.0%) of the respondents experience such constraints this could be in connection to their inability to access loans from banks, however, this contributes immensely to unavailability of fishing equipments and raw materials. (66.7%) resulting to lack of access to improved brood stocks improved fish feeds, proper water management technology.

From the survey, the costs and returns structure had a total income generation of N7,348,260 with a gross margin of N7,651,740 with an average production capacity of N15,000,000. The major constraints which remain one of the reasons for low participation of women in small scale fish farming enterprise in the study areas was a combination of inaccessibility to credit, lack of modern technology expertise, high cost of fishing inputs among others discussed.

## CONCLUSION

In Nigeria, the role of women in contributing towards the socio-economic livelihood of their households in fish farming was grossly undermined and their potentials were not fully harnessed. This study has shown that women have fishing potentials, as they were being used in the artisanal fisheries who were seen to be active in processing and marketing of fish. There are giant potentials for women to freely participate in actual fish farming if the socio cultural, technological and financial constraints such as lack basic social amenities, technical and skillfully handled by the extension workers. The women fish farmers should be supported by the federal, state and LGAs in provision of credit in supply of fishing inputs, social amenities provisions and processing tools. Financial supports should be made available timely and fish farmers should be encouraged to form themselves into cooperative societies for easy access to fishing inputs purchases and credit supplies.

## REFERENCES

- Adebayo, O. and Pitan, O.O. (2001). The Role of Women in Marketing of Frozen fish in Lagos of Nigeria, presented at the 16<sup>th</sup> Annual Conference of Fisheries Society of Nigeria (FISON) at Maiduguri. 4<sup>th</sup>-9<sup>th</sup> Nov. 2001 pp 156.
- Adegbite, D.A. and Oluwalana. E.O. (2004). Revolving loan scheme as a poverty alleviation strategy: A case study of women Groups in UNAAB Extension villages", *FAMAN J.* 7(2): 18-32.
- Adegbite, D.A., Oloruntoba, A.O. And Olaoye, O.J. (2008). Performance Assessment of Ogun State Agricultural and Multi-purpose' credit Agency - (OSAMCA) in credit delivery and operation (2004-2006). *J. Sustainable Develop. in Afr.* 10(3): 127-153.
- Ashaolu. F.O, Akinyemi, A.A. and Nzekwe, L.S.O. (2006). Economic viability of homestead fish production in Abeokuta metropolis of Ogun State, Nigeria./*UstV. J. Series A*, 6(2): 209 - 220.
- Bello, M.O., (2000). "Categorization of potential adopters for organic based fertilizer among vegetable farmers in Ojo LGA, Oyo State. B. Agric. Project University of Agriculture, Abeokuta. 120p.
- Delgado, C. L., Wada, N., Rosegrant, M.W.M , Meyer, S. and Ahmed, M. (2003). Fish to 2020: Supply and demand in changing global markets. International Food Policy Research Institute (IFPRI), Washington. D.C. and World fish-Centre, Penang, Malaysia. 235p.
- Food and Agricultural Organization, FAO, (2009).The state of world fisheries and Aquaculture 2010. Food and Agriculture Organisation, Rome. Italy. 20P.
- George, F.O.A., Idowu, A. A. and Odulate, D.O. (2011). Role of women in fisheries in coastal wetland areas of Ogun State, Southwest Nigeria.Proceedings of the Environmental Management Conference Federal University of Agriculture, Abeokuta, Nigeria. Pp3
- Lahai, B.A.N., Goldey, P.A. and Jones, G.E. (2000): "The gender of the extension agent zrAfarmers' access to and. participation in agriculture extension in Nigeria" *J. Agric. Educ. and Ext.* (6)4: 223-233.
- Mafimisebi, T.E. (2004). Determinants of yield performance of commercialized fish farms in two local Government Areas of Ondo State, Nigeria. *Ogun Journal of Agricultural Science* (3)1: 157-173.
- Ogunbadejo, H.K, Alhaji, T. and Otubusin, S. (2007). Productivity of labour in artisanal fish farming in Nigeria *Afri. J. Appl. Zool. Enviro. Biol.* 9: 74 - 77.
- Olaoye, O.J. and Odebisi, O.C. (2011).Economic viability for the use of microfinance ba:k loan on aquaculture development in Ogun State, Nigeria. *Int J. Fisheries and Aquaculture* 3 (4): 70-77.
- Olubanjo, O.O., Akinleye, S.O. and Balogun, M.A. (2007).Occupational characteristics, technology use and output determinants among fisher-folks in Ogun WatersideArea, Ogun State.*FAMAN (Farm Manage. Assoc. Nig. J.* (2): 1 -7.