Nigerian Journal of Fisheries and Aquaculture 2(1): 6 – 14, May 2014

Department of Fisheries, Faculty of Agriculture, University of Maiduguri, Nigeria
Available on: www.unimaid.edu.ng
ISSN-2350-1537

Resource-Use Efficiency of Male and Female Fish Farmers in Maiduguri: A Comparative Analysis

*[1]Mohammed, S.T., [1]Ghide, A.A., [1]Shettima, B.G. and [1]Umoru, M.Y.
[1]Department of Agricultural Economics, University of Maiduguri, Nigeria

Received January 15, 2014 Accepted February 13, 2014

ABSTRACT
This paper examined the resource-use efficiency of fish farmers in Maiduguri metropolis, Borno state, Nigeria. The specific objectives of the study were to examine the socio-economic characteristics of fish farmers, analyze profitability of fish farming, estimate the production function of fish farmers, determine the resource-use efficiency of fish farmers and investigate problems militating against fish farming in the study area. Respondents for the study were chosen first by purposive selection of male and female fish farmers to form the sampling frame. From the list of male and female farmers 16 each were selected proportionately at random to form 32 respondents for the study. The data used were derived from primary sources by means of structured questionnaires. Descriptive and inferential statistics were used to analyze the data. Descriptive statistical tools used were frequency distributions and percentages while inferential tools comprised net farm income analysis, Ordinary Least Square (OLS) regression analysis and efficiency ratio. The result revealed that majority of the male and female farmers were aged between 31 and 40 years. Most of the farmers have tertiary education and fish farming experience of between 1 and 5 years. Most of the respondents were married and have household sizes of between 7 and 9 persons in a family. Fish farming was found to be profitable with average profit per kilogram of ₦359.23 and ₦306.10 for male and female farmers respectively. Significant factors that determine fish production in the study area were feed, number of fingerlings and labour. These resources were however found to be over utilized by both male and female farmers. Major problems affecting fish farmers were high cost of fish feeds, inadequate improved fingerlings and lack of credit facilities. The study concluded that fish farming is a profitable venture and production resources were not efficiently utilized. There is evidence also that fish enterprises suffer some production constraints. It is therefore recommended that efficiency could be attained if resources that were excessively used are reduced and cheap sources of good production resources are exploited.

Key Words: Resource-Use Efficiency; Fish Farmers; Comparative Analysis; Maiduguri; Nigeria.

INTRODUCTION

Fish is of immense importance in providing protein for humans. It improves nutrition in that it has a high nutritional value in terms of high protein retention in the body (Anthonio and Akinwume, 1991). Fish and fish products constitute more than 60% of the total protein intake in adults especially in rural areas (Adekoya and Miller, 2004). It contains essential amino acids mostly lacking in plant sources, vitamins such as A and D, minerals such as phosphorous, calcium and sulphur, and also contains low levels of cholesterol (LSMAC, 2003). Fish can convert food into body tissue more efficiently than most farm animals, transforming about 70 percent of their feed into flesh (Dougherty *et al.*, 2000). When compared with livestock, fish require less space, time, and money and has a high feed conversion rate

*Corresponding Author: E-mail –stmohammed@yahoo.com

(FAO, 2001). It is the cheapest source of protein Worldwide (Nzeka, 2003). Fishery products are potential answers to the growing problem of World's dietary animal protein shortage (Egwui, 2000).

In Nigeria most of the fish consumed are sourced from the wild (artisanal fishery) usually by small scale fishers using traditional fishing gears. Animal protein provided is insufficient to meet the requirement of the people. As at 2002, demand for fish was put at 2,168,000 metric tonnes while total production of fish per annum is 452,146 metric tonnes (FAO, 2002). This indicates a short fall of more than 79% suggesting a large production gap that can be filled by aquaculture.

Fish farming is the rearing of fish in tanks or enclosures under controlled or semi- controlled conditions usually for food. Fish farming activity in Nigeria started only about 50 years ago (Olagunju *et al.*, 2007). It has the potential of producing at least 65,815 tonnes of fish per annum in Nigeria (Tobor, 1990) in 2013, Nigeria produced over 400,000 metric tonnes of culture fish. This far exceeds the potentials. This potential is no longer relevant. Fish farming is a practice carried out by both men and women. This is unlike artisanal fishery which is mainly dominated by the men while the women are mostly involved in processing and other post-harvest activities. Studies have shown that women were found to be actively involved in fish farming and they have significantly contributed to the growth of the fishery sector in India (Sunderarajan, 2006).

The consideration of men and women as separate entities when examining development activities has become virtually a universal preoccupation (Oseni, 2004). It has been established that fish farming is a good source of income and since it is undertaken by both men and women (Mohammed *et al*., 2011), it has therefore become relevant to carry out a comparative analysis of the performance of male and female fish farmers in Maiduguri, Borno State where fish farming was found to cut across gender divides. The objective of the study is to investigate the relative performance of male and female fish farmers in resource inputs utilization with a view to stemming the tide responsible for performance differentials.

METHODOLOGY

The study was conducted in Maiduguri metropolis, the capital of Borno State, Nigeria. It has a total land mass of 50,778 square kilometres and lies between latitudes 11^{O} and 14^{O}N and longitudes 10^{O} and 14^{O}E (Borno State Ministry of Land and Survey, 2007). Maiduguri has a population of about 521,492 people of which 290,449 were males and 231,043 were females (National Population Commission, 2006). Temperature ranges from 35^{O}C to 40^{O}C during most part of the year while average rainfall is about 647mm per annum (Lake Chad Research Institute, 2007). Major crops cultivated by the people include: maize, millet, guinea corn, groundnut, cowpea and vegetables such as spinach, tomato, onion, pepper and sorrel. Livestock reared by the people include: Sheep, goat, cattle and poultry. Artisanal fishery is common due to natural water bodies in and around the state. Fish farming is becoming popular within the metropolis and production cuts across gender groups.

Data collection

A list of fish farmers in Maiduguri metropolis was compiled to form the sampling frame. The number of male and female farmers was similar therefore equal number of respondents was selected by random sampling technique. By this, 16 each of male and female farmers were chosen making a total of 32 respondents. Primary data used for the study were collected directly from the farmers using structured questionnaires.

Data analysis

Descriptive and inferential statistics were both used to analyse the data obtained. Frequency distribution, percentages and Net Farm Income (NFI) analysis were the descriptive statistical tools used while multiple regression using Ordinary Least Square (OLS) method was the inferential statistical tool used.

The model for Net Farm Income is expressed as: NFI= GR – TC Where, NFI= Net Farm Income (₦/kg). GR= Gross Return from sales of fish (₦). TC= TVC + TFC, TC= Total Cost (₦), TVC= Total Variable Cost (₦), TFC= Total Fixed Cost (₦), The Multiple Regression model used is explicitly expressed as: $Y= \alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + e$; Where, Y=Output of fish (kg), X_1= Quantity of feed (kg), X_2=Stocking density (number of fingerlings), X_3=Cost of labour (₦), X_4=Cost of medication (₦), X_5=Quantity of water used (Litres), e= Error term, α, β_{1-5}= Coefficients to be estimated.
The best fit functional form was chosen based on the following criteria:
i. Magnitude of the coefficient of determination (R^2);
ii. Statistical significance of the coefficients;
iii. The *a priori* expectation; and
iv. Signs of the coefficients.

The *a priori* expectation was that output will increase with increase in quantity of feed, stocking density, labour, medication and water. Resource use efficiency was determined using the following expression: r = MVP/MFC, Where, r = efficiency ratio, MVP= Marginal Value Product, MFC= Marginal Factor Cost

The MVP was estimated as: $MVP= MPP_{Xi}.P_Y$, The MVP of each of the resource inputs was estimated using the regression coefficients as follows:
$MPP_{xi} = \partial y/\partial x_i = b_i/x_i.Y$ double log function, Where; MPP=marginal physical product, X_i= mean value of input I, b_i= estimated regression coefficient of input I, P_Y= price of a unit of output, the decision criteria were as follows: r = 1, resource is efficiently utilised, r > 1, resource is underutilised, r <1, resource is over utilised.

RESULTS AND DISCUSSION

Socio-economic characteristics of male and female fish farmers

The socio-economic characteristics studied include; age, educational background, marital status, household size, years of experience in fish farming, primary occupation and goal of production. Table 1 shows socio-economic characteristics of the male and female respondents. Majority (62.50%) of the male farmers were between the ages of 21-40 years with only 12.50% above 50 years. This differs with that of the female respondents which shows majority (62.50%) were between the ages of 41-50 years with 37.50% between the age ranges of 31-40 years. This implies that fish farmers were mostly in their most active years in line with Mohammed *et al*. (2011). Farmers in their active age are expected to supply the labour required by the exercise.

Table 1 also shows that majority of the respondents (93.75% male and 75.04% female) had tertiary education. This may be attributed to the nature of the research area (Maiduguri metropolis). There are a number of tertiary education institutions and a good presence of government and private institutions in the city that provided opportunities to people in the vicinity to attain such levels. This is similar to the findings of Olagunju *et al.* (2007) where 63.3% of fish farmers in Oyo State Nigeria have tertiary education. Most of the respondents were married with 75.0% and 62.50% of male and female married, respectively. This indicates that most of the fish farmers in the study area were married. The implication of this finding to fish production could be viewed in the light of income diversification drive for married individuals apparently due to additional household responsibilities that could require extra money to finance. Ohen *et al*. (2009) also found 69% of fish farmers in Rivers State to be married.

Analysis of household size revealed that 56.25% and 68.75% of male and female farmers respectively had household size of 7-9 persons. Large household size in traditional agriculture could mean farm labour availability; this result suggests the availability of family labour to manage the fish farms.

Table 1: Socio-economic Characteristics of Male and Female Fish Farmers in Maiduguri Metropolis

Variable	**Male**		**Female**	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Age				
21-30	4	25.00	-	-
31-40	6	37.50	6	37.50
41-50	4	25.00	10	62.50
51 and above	2	12.50	-	-
Education				
Secondary	1	6.25	4	25.00
Tertiary	15	93.75	12	75.00
Marital status				
Married	12	75.00	10	62.50
Single	4	25.00	6	37.50
House hold size				
1-3	2	12.50	1	6.25
4-6	5	31.25	4	25.00
7-9	9	56.25	11	68.75
Experience (yrs)				
1-5	13	81.25	15	93.75
6-10	3	18.25	1	6.25
Primary Occupation				
Civil service	14	87.50	14	87.50
rading	2	12.50	2	12.50
Goal of production				
Profit	12	75.00	11	68.75
Consumption	1	6.25	-	-
Both	3	18.75	5	31.25

Source: Field Survey, 2011.

Majority of the farmers (81.25% male and 93.7% female) had farming experience of 1-5 years while only 18.25% male and 6.25% female had 6-10 years' experience. This suggests that fish farming is fairly a new occupation in the area. The primary occupation of the respondents is civil service with 87.50% the male and female respondents being on government payroll as a major income source. Only 12.50% of all the respondents had fish farming as their primary occupation. From this result, it can be deduced that majority of the farmers in Maiduguri are into fish farming as an additional source of income. As most of the farmers are civil servants, the result suggests that civil servants venture into fish farming to augment their income and could also be preparatory to retirement from service.

Production goals of the respondents show majority were into fish farming for profit. About 75% male and 68.75% female respondents indicate profit making as the primary goal of their businesses. This further reaffirms the position of fish farming as an alternative and veritable income source. Only 18.75% and 31.25% of the male and female respondents respectively indicated a dual goal of personal consumption and for profit.

Profitability of male and female fish farmers

Table 2 shows comparative analysis of costs and returns of male and female fish farmers in Maiduguri metropolis. Cost of fingerlings and feeds constitutes 95.30% and 93.90% of total cost for male and female farmers respectively. This shows that cost of feed and fingerlings accounted for majority of variable cost items in fish production in the area. This is in line with what was reported by Mafimisebi (2004) that cost of feed and fingerlings accounted for more than 60% of total variable cost. The cost of labour for both gender categories constituted 1.16% and 1.79% for male and female farmers respectively. The low cost of labour may be attributed to few services required from external sources or that labour provided by the family members was not accounted for in farm cost analysis.

In most cases farmers appear not to regard family labour as part of costs incurred in production simply because no money was paid in return for family labour. Economically speaking, family labour is imputed into production cost by considering the opportunity cost of labour services provided by a family member when such service is rendered elsewhere.

Male fish farmers had a profit of ₦359.23 per kg while the females had a profit of ₦306.10 per kg of fish sold. The male farmers' profit was higher than that of the female farmers even though the former incurred relatively higher cost of important inputs such as in procurement of fingerlings and feeds. However, the female farmers were also observed to have higher outlay in providing other variable inputs than their male counterparts. These discrepancies may be some of the reasons underlying the observed differences in profits between the two. Increase in cost without increase in price of output could reduce net profit. In this regard, male farmers have lower average cost in relation to female farmers and hence justifying profit differentials between the enterprises.

Determinants of fish production

The double log function was the model that best fit the fish production data obtained based on the stated criteria. The result of the Ordinary Least Square regression analysis revealed R^2 values of 0.71 and 0.54 for male and female farmers respectively (Table 3). This indicates that about 71% and 54% of variation in yield of fish for male and female farmers respectively were explained by the specific factor inputs included in the model. The remaining 29% for male and 46% for female were accounted for by factors that were not included such as quality of water, mode of harvesting, years of experience in fish farming and other exogenous factors that are beyond the farmers control.

The coefficient of feed (X_1) was positively related to fish output and statistically significant at 5% and 1% for male and female, respectively. This shows that the weight gain increases with feed intake and feed is a determining factor of fish output. This finding agrees with Mohammed *et al.* (2011) who found a positive relationship between fish output and feed quantity. The coefficient of number of fingerlings (X_2) was positive and statistically significant at 5% for male and at 1% for female farmers. This indicates that fish output increases with the number of fingerlings stocked. The finding conforms with the *a priori* expectation that number of fingerlings stocked in the pond has a direct relationship to the quantity of fish harvested. Olagunju *et al*. (2007) also obtained a similar result.

The coefficient of cost of labour (X_3) was positive with fish output and statistically significant at 1% for both male and female farmers. This also conforms to the *a priori* expectation that the higher the productive labour used, the greater will be the level of output. Labour could relate to the time devoted in giving the desired care which the fish require for proper growth.

Table 2: Analysis of Costs and Returns of Fish Farmers in Maiduguri Metropolis

Variable	Male		Female	
	Value (₦)	Percentage (%)	Value (₦)	Percentage (%)
Gross revenue	3,520,470		2,920,000	
Variable costs				
Fingerlings	398,250	37.30	333,980	36.50
Feeds	619,740	58.00	525,000	57.40
Labour	12,390	1.16	16,400	1.79
Medicare	8,300	0.80	10,640	1.16
Fuel/lubricants	15,290	1.43	16,210	1.77
Maintenance	13,720	1.29	12,500	1.37
TVC	1,067,690		914,730	
Fixed costs				
Depreciation on ponds	218,188		158,418	
Depreciation on pumps	80,700		71,174	
TFC	298,888		229,592	
NFI	2,153,892		1,775,678	
NFI/kg	359.23		306.10	

Source: Computed from Survey Data, 2011.

Table 3: OLS Regression Results of Fish Production in Maiduguri Metropolis

Variable	Male		Female	
	Coefficient	t-values	Coefficient	t-values
Constant	0.637	1.779	0.729	1.878
Qty of feed	0.366	2.497**	0.148	2.521***
No. of fingerlings	0.225	2.070**	0.217	3.832***
Cost labour	0.248	2.884***	0.365	2.222**
Cost of medicare	0.125	1.040	0.438	0.844
Qty of water	0.065	0.755	0.112	0.662
R^2	0.71		0.54	

***Significant at 1%, **Significant at 5%.

The coefficient of medication (X_4) was positive but not statistically significant for both male and female farmers. Although medication is an important input in fishery management, non-significance of its coefficient in this study could be explained from the point of view of the existence of disease causing organisms or otherwise at a point in time. Certain seasons of the year may favour proliferation of fish disease causing organisms than others. In this regard, disease prevalence may be high during favoured periods and low during less favourable periods. Since fish can be produced severally in a year, the set produced during cool season for instance is less likely to be affected by diseases and data so collected are likely to render the coefficient of medication insignificant. The implication therefore is that medication in fishery management could be crucial in some periods and less so in others given the weather factors in a study area. The coefficient of quantity of water (X_5) was positive but not statistically significant which means that fish growth is not influenced by the volume of water it lives in.

Resource-use efficiency

*Corresponding Author: E-mail –stmohammed@yahoo.com

Analysis of resource use efficiency is presented in Table 4. The ratio of marginal value product (MVP) and marginal factor cost (MFC) were less than one (<1) in all cases indicating that feed, fingerlings and labour were excessively utilized by both male and female fish farmers in the study area. Although resources were all excessively utilised in both farms labour is clearly most over utilized (0.04 in both). Fingerlings were relatively most utilized in both male and female farms with efficiency ratios of 0.77 and 0.57 for male and female farmers respectively. Comparatively, the male farmers utilised it more than their female counterparts. The differences in profits of male and female farmers could be explained by the differences in their efficiencies in resource utilization. Wategire (2006) in his study of economics of fish farming in Delta State Nigeria, reported that the ratios of MVP and MFC for feed, fingerlings, and labour were 0.13, 0.09 and 0.67, respectively indicating that feed, fingerlings and labour were all excessively utilised in the study area.

Table 4: Resource-Use Efficiency Estimates for Male and Female Farmers in Maiduguri Metropolis

Variable	**Male**			**Female**		
	MVP	**MFC**	**Efficiency Ratio**	**MVP**	**MFC**	**Efficiency Ratio**
Quantity of feed	238	550	0.44	253	530	0.48
Fingerlings	23.1	30	0.77	18.9	33	0.57
Labour	6.3	175	0.04	5.5	145	0.04

Source: Computed from regression results.

Elasticity of production

Table 5 shows the elasticities of various inputs used in male fish farms. The sums of elasticities for the male and female farms were 1.05 and 1.29, respectively. This implies that if all inputs are increased by 1%, output will increase by 1.05% and 1.29% for male and female farms, respectively. Although both male and female fish farms had sum of elasticity of production greater than one (>1) implying increasing return to scale with female farms having higher increasing returns. Olagunju *et al.* (2007) in their study on cat fish production in Oyo State, Nigeria, reported that the sum of elasticity of major inputs used was 1.53 indicating increasing returns to scale. Similarly, Kudi *et al.* (2009) in their study of analysis of fish farming in Kaduna State, Nigeria, reported that the sum of elasticities of various inputs used was greater than one also indicating increasing returns to scale.

Table 5: Estimates of Production Elasticity's for Male and Female Farms in Maiduguri Metropolis

Variable	**Coefficient**	
	Male	Female
Quantity of feed	0.37	0.15
Number of fingerlings	0.23	0.22
Labour	0.25	0.37
Cost of medical care	0.13	0.44
Quantity of water	0.07	0.11
Elasticity of Production	**1.05**	**1.29**

Source: Computed from regression results.

Problems of fish farming

There are problems that confront fish farming in Maiduguri metropolis, Table 6 presents some of the pressing ones. The major problem confronting fish farmers in Maiduguri metropolis was high cost of feed as shown by 22.22% of the respondents. This problem was also acknowledged to be the most important

problem of fish farmers in Owerri agricultural zone, Imo state, Nigeria (Adeka *et al*., 2006). Unavailability of improved fingerlings was also found to be a major problem faced as shown by 21.30% of the respondents. This may be attributed to the few fish breeders in the study area. Egwui (2000) found scarcity of fingerlings in Nigeria to be a major constraint to fish farming which is as a result of few fish breeders in the country. Also, 21.30% of the respondents were affected by inadequate capital and/or access to credit facility. Lack of credit is a constraint to fish farming in Maiduguri.

Table 6: Constraints to Fish Farming in Maiduguri Metropolis

Problem	**Frequency***	**Percentage (%)**	**Ranking**
High cost of feed	24	22.22	1st
Improved fingerlings	23	21.30	2nd
Lack of credit	23	21.30	2nd
High temperature	14	12.96	3rd
Management	10	9.26	4th
Diseases	10	9.26	4th
Post-harvest losses	4	3.70	5th

*Multiple responses exist hence, frequency more than 32.

According to Central Bank of Nigeria (2008) report, only 2.1% of total loan disbursed to the agricultural sector between 1995 and 2008 went to the fishery sub-sector. This could be the reason why there is difficulty in getting access to credit. High ambient temperature, management difficulty and disease prevalence were rated as the 3rd and 4th problems of fish farming in the study area. Only 3.70% reported post-harvest spoilage as a problem of fishery in the study area even when high temperature was considered as the 3rd important problem. This low level of product spoilage may be because farmers sell their products immediately after harvest since fish demand is higher than supply apparently due to few producers or small scale nature of production enterprises existing in the metropolis.

Conclusion

The result of the study showed that fish farming is a profitable business venture which greatly contributes to the livelihood of both men and women in Maiduguri. Male farmers however received higher profits apparently due to their efficiency in resource utilization. The major determinants of fish production in the study area were feeds, number of fingerlings and cost of labour. Although resources were not efficiently utilized by both male and female farmers, they were relatively more efficiently used among male farmers. Cost of feeds, unavailability of improved fingerlings and lack of credit were the major problems militating against fish farming in the study area.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Research should be directed at providing feeds that can be produced at lower cost to improve farm profits.
2. Resources were found to be excessively utilized therefore, quantities of feeds, fingerlings and labour should be reduced.
3. Procurement of resource inputs such as feeds and fingerlings could be easier if farmers form cooperative associations. Fish farmers should therefore consider organizing themselves into cooperative associations so as to pool their resources together for better performance.
4. Government should assist fish farmers with flexible credit facilities to expand their ventures and to be able to procure improved purchased inputs.

5. Training of extension workers in the field of fishery would be an important measure to tackle farm management difficulties experienced by farmers.

REFERENCES

Adeka, C.N., Anyanwu, P., Ezenwa, P. (2006). Economic Analysis of Fish Farming in Owerri Agricultural Zone, Imo State, Nigeria. *Journal of Fisheries Society of Nigeria* 1:144-148.

Adekoya, B.B. and Miller, J.W. (2004). Fish Cage Culture Potential in Nigeria – An Overview, National Cultures. *Agriculture Focus*, 1(5): 10.

Anthonio, Y. and Akinwume, R.T. (1991). *Small Scale Fresh Water Fish Farming*. *Agromisa* Press, Netherlands, 1-3.

Borno State Ministry of Land and Survey (2007). *Annual Report*, 15-18.

Central Bank of Nigeria (2008). *Annual Report and Statement of Accounts*, Abuja, Nigeria.

Dougherty, C.P., Henricks, H.S., Reinert, I.C., Panya, L., Axerald, D.A. and Woodruff, T. (2000). Dietary Exposure to Food Contaminants across the United States. *Environmental Research*, 8: 188Pp.

Egwui, P.C. (2000). Construction of Homestead Concrete Fish Pond. *Anambra/Imo State Agricultural Development Programme Monthly Technology Review Meeting, Akwa, Nigeria*, 9Pp.

FAO (2001). Integrated Agriculture-Aquaculture: A Primer. *Fisheries Technical Paper*, No. 407, Rome Available on: www.fao.org/docrep/005/y1187e/y1187e07.htm#h, 149Pp.

Food and Agricultural Organisation, FAO (20 02), *Report of the FAO World Conference of Fisheries Management*, Rome, 60 Pp.

Kudi, T.M., Bako, F.P. and Atala, T.K. (2009). Economics of Fish Farming in Kaduna State Nigeria, *ARPN Journal of Agriculture and Biological Science*, 3 (5 and 6):17-21

Lake Chad Research Institute (2007). *Annual Weather Report*.

LSMAC (2003). *Homestead Farming*. Lagos State Ministry of Agriculture and Cooperatives. Lagos State Government Press, 5-7.

Mafimisebi, T.E. (2004). Determinants of Yield Performance of Commercialised Fish Farms in Two Local Government Areas of Ondo State, Nigeria. *The Journal of Ogun Agricultural Science.* (3):157-173.

Mohammed, S.T., Apagu, J. and Shettima, B.G. (2011). Economic Analysis of Cultured Fishery in Maiduguri, Borno State, Nigeria. *Journal of Sustainable Development*, 8(1and 2) 60-65.

NPC (2006). National Population Census.

Nzeka, U. (2003). Nigeria's Demand for Seafood is high. *U.S Department for Aqua Culture*. Available on:www.findarticle.com/P/articles, 25th June 2012.

Olagunju , F.I., Adesiyan, I.O. and Ezekiel, A.A. (2007). Economic Viability of Catfish Production in Oyo State, Nigeria. *Humecol* 21(2): 121-124.

Ohen, S.B., Agom, D.E. and Okon, U.H. (2009). Economics of Catfish Farming in Rivers State, Nigeria. *Proceedings of the 23rd Annual National Conference of Farm Management Society of Nigeria. 14th – 17th December*, Sokoto, Nigeria, 570-572.

Oseni,J.O.(2004). Structure and Operation Agricultural Extension in a Democratic and Deregulated Economy. National Conference of Agricultural Extension Society of Nigeria. *Annual Report*, 65-79.

Sunderarajan, M. (2006). Role of Women in Fisheries Putting the Pieces Together. *Proceeding of the Global Symposium on Women in Fisheries*, 5-6.

Tobor, J.G. (1990). The Fishing Industry in Nigeria. Status and Potentials for Self Sufficiency in Fish Production. *NIOMR Technical Paper*, 54:7-12.

Wategire, B.B. (1986). Economics of Fish Farming in Delta Area of Bendel State, Nigeria. Unpublished *M.Sc. Dissertation*. Department of Agricultural Economics, University of Ibadan, Nigeria. 86Pp.