

An investigation into the factors facilitating extension services available to fish farmers in Ijebu-Ode agricultural extension zone, Ogun State, Nigeria

Olaoye*[1], O.J., Ezeani[2] , S.I. and Onifade[1], O.T.
[1.]Agricultural Media Resource & Extension Centre, Federal University of Agriculture, Abeokuta.
[2.]Federal College of Education,Osiele, Abeokuta
*Corresponding Author: olaoyeoj@funaab.edu.ng

Abstract

Extension services bridge the gap between research and farmers for increased productivity and improved livelihood. The study investigated the factors facilitating extension services available to fish farmers in Ijebu Ode Agricultural Extension Zone, Ogun State, aimed to determine fish farmers' preferences, the costs and returns of fishes and the constraints hindering extension services available to the respondents. Purposive and simple random sampling techniques were used to select respondents from all the six extension blocks in Ijebu Ode Zone of Ogun State ADP. One hundred and seventeen fish farmers were randomly sampled using structured interview schedules. The study revealed the mean and standard errors of age, household size and fish farming experience as 46.6±0.9 years, 6±0.3 persons and 6±0.4 years, respectively; 67.5% were male, married (76.1%) and all were literate. Formal sources of extension services available to fish farmers were extension agents from ADPs (99.1%), JDPC extension workers (54.7%) and NGOs (44.4%).Informal sources include; friends and relations (70.9%), extension guide/bulletins (70.9%), and the mobile phone (41.9%). Farmers showed preferences for extension services like field demonstrations (91.5%), fishing inputs marketing information (88.0%), farm record keeping (81.2%) and environmental management (79%). There was significant association between fish farmers' marital status ($\chi^2 = 29.67, p < 0.05$), educational status ($\chi^2 = 22.63, p < 0.05$) and nature of extension services available to them. However, no significant relationship was found between the nature of extension services available and age ($r = 0.012; p > 0.05$), years of experience ($r=-0.074; p<0.05$) and house hold size ($r = 0.033; p > 0.05$). There was association between nature of extension services available to fish farmers and their profitability (($\chi^2 = 173.088, p < 0.05$). For more effective extension service delivery, this study recommends better linkage of fish farmers to credit sources, favourable government policy on agriculture, proper funding of extension service and remuneration of extension personnel.

Key Words: Contact fish farmers, Extension services, Extension agents, Fisheries development, Fish farming, Ijebu Ode zone

Introduction

Extension service as one of the pillars for development plays an important catalytic role in aquaculture and rural development efforts in Ogun State, Nigeria. It serves as the source of information on new technologies for fish farming communities which when adopted can increase and improve farmers' production performance and quality of life and income, thereby liberating households from poverty (Bonye *et al*., 2012, DFID, 2001).

Various organizations are involved in extension services in Ogun State, Nigeria.

These include public-funded institutions such as the Ministry of Agriculture and Natural Resources, Extension Services Unit; Ogun State Agricultural Development Programme (OGADEP), a variety of Non-Governmental Organizations (NGOs) such as Justice Development Peace Commission (JDPC), Justice Development and Peace Movement (JDPM), Farmers' associations, Universities Extension Centres, public and private agro-chemical input suppliers.

The task of information exchange, as indicated by Oladele (2001) and Yahaya (2003) is usually accomplished through various approaches of agricultural extension service delivery. These include; Training and Visit (T&V), Unified Agricultural Extension Services (UAES), Contact Farmer or Farmer-to-Farmer and Transfer of Technology approach to extension service delivery to ensure that farmers adequately access information for enhanced production. Importantly, the extension systems constitute a framework through which farmers are organized into functional groups in order to gain access to production resources such as credit, inputs, marketing services and information on government development programmes (DFID, 2001).

Organizing fish farmers into functional groups will assist fisheries extension agents in directing resources more vigorously to fish farmers in the study area, the nation as a whole and further increase domestic fish production (Alamu *et al.,* 2004). This will help to solve the problem of total domestic fish production which has been found far less than the total domestic demand (Bada and Rahji, 2010) and the fear that the unsatisfied demand will continue to be met through importation unless policies and actions are geared towards improving domestic production in a sustainable way through aquaculture (Rahji *et al.*, 2001).Therefore, this study investigates the factors facilitating extension services available (appropriate technologies or the necessary agricultural information) to fish farmers in Ijebu Ode Agricultural Extension Zone of Ogun State, Nigeria with the following specific objectives , to:

i. describe the socio–economic characteristics of the fish farmers in the study area;
ii. ascertain the factors facilitating extension services available in the study area;
iii. determine fish farmers' preferences for the factors facilitating extension services available in the study area;
iv. determine the costs and returns in relation to factors facilitating extension services available to fish farmers; and
v. determine the constraints hindering extension serves availability in the study areas.

Significance of the study

Aquaculture has contributed remarkably to the Nigerian economy by boosting fish production in the country (Word Fish Centre "WFC", 2005). Consequently, this has assisted to augment fish supply from the wild. The high level of demand for fish and fish products in Nigeria brought about aquaculture extension services available to complement fish products from the wild. Ultimately, this will assist fisheries extension agents in directing resources more vigorously to fish farmers in the study area, the nation as a whole and further increase domestic fish production (Alamu *et al.,* 2004). This will also serve as a source of knowledge for students as well as local and international institutions in the development of aquaculture in Nigeria.

This research work will be made available to various stakeholders through organization of seminars, workshops, conferences and published in reputable journals and conference proceedings.

Research hypotheses

The following hypotheses tested in this study stated in null form were:

Ho_1: Socio-economic characteristics of fish farmers have no significant effect on the factors facilitating extension services available to them.

Ho_2: There is no significant association between factors facilitating extension services available and output (Profit) of the fish farmer.

Ho_3: There is no significant association between fish farmers' preferences and output (Profit) of the fish farmers .in the study area.

Materials and methods

The study was conducted in Ijebu Ode Agricultural Extension Zone of Ogun State, South western Nigeria. The zone has six blocks, consisting of Ala, Ago Iwoye, Ijebu Igbo, Isonyin, Ibi-ade, and Ijebu-Ife (Figure 1). (OGADEP, 2007; Olaoye *et al.,* 2010)

Data collection, Sampling procedure and Sample size

A combination of purposive and simple random sampling technique was used in selecting 117 respondents for the research study. The purposive factor was the ownership of fish farms. Based on this, the study concentrated on privately owned fish farms (Aromolaran, 2000). Simple random sampling technique was used to select the respondents from the list of fish farmers supplied by Ogun state Agricultural Development Programme (OGADEP) i.e. sampling frame.

Reliability and Validity of research instrument

The reliability test was done through the test-retest method in which the research instruments were administered to some selected respondents who were not included in the actual study population within the space of two weeks in order to ascertain the consistency of result obtainable from several administered instruments. A reliability coefficient (r) of 0.75 on the average obtained for each section of the research instrument was considered good and reliable measure as instrument for the data collection.

The research instrument was validated for face and content (as well as for clarity and purposefulness by the judgments of experts in fisheries and agricultural extension service.

Data Analysis

The data collected were subjected to descriptive statistics, budgetary technique and inferential statistics. Descriptive techniques such as frequency distribution and percentages were used to describe the socio-economic characteristics, determine the factors facilitating extension services available to the respondents, Fish farmers' preferences for the factors facilitating extension services available and constraints to extension services availability. The budgetary technique (economic indicators) was used to determine the costs, returns and profitability indices of the fish farming. Models used in estimating the costs, returns and profitability indices in relation to factors facilitating extension services available to fish farmers were according to Olukosi and Ehabor, 1988, Okwn and Acheneje, 2011.

GM = ΣTR - ΣTVC…… (i)
TR = Py ·Yi……...……(ii)
TVC = Pxi · X ……...……..(iii)
TC = TVC + TFC …….……....(iv)
NFI = GM - TFC…… ……..(v)
BCR = TR/TC ……...…… (vi)
NPM = NFI/TR …… …(vii)
ROR = NR/TC…… ……..(viii)
NM = TR/TFC …….. …(ix)

Where:
GM = Gross Margin (N)
TR = Total Revenue (N)
TVC = Total Variable Cost (N)
TFC = Total Fixed Cost (N)
TC =Total Cost (N)
NFI = Net Farm Income (N)
Py = Unit Price of Output Produced (N)
Y = Quantity of Output (kg)
Pxi = Unit Price of Variable input i used (N)
Xi = Quantity of Variable Input i (kg)
NPM = Net Profit Margin (N)
ROR= Rate of Return on investment, %

Results and discussion

Result showed that the mean age of fish farmers in the study area was 46.59 years (Table 1). This implies that, fish farming as a labour intensive business requires the involvement of enthusiastic, agile and innovative individual (Olaoye *et al.*, 2010). Sanni, (2009) described this age bracket as mentally alert and with greater flexibility in accepting innovation and dealing with risks in fish farming business. Noting the importance of age, Oladoja and Adeokun, (2013) stressed the importance of young farmers' involvement in agriculture towards ensuring food security in Nigeria. Perhaps as a result of the labour intensive nature of the business, this study found that majority of the respondents was male (67.5%). Moreover, 76.1 percent were married. Fifty nine percent of the respondents completed secondary education which is an indication of easy comprehension of extension message or services. In addition, level of education will afford farmers the opportunity of keeping accurate record of activities on their farms. With majority of the farmers being married and having a household size of 6 persons, it is expedient that these categories of farmers have alternative sources of income to cope with family demands. Thus, this study also found out that 70.9 percent of the respondents are into the business as additional source of income because fish farming was done mostly on part basis indicating retired civil servants were common in fish farming business in the study area. The average fish farming experience of the respondents was 6±0.4 years which is an indication that fisheries business is gradually taking root in the study area. Majority (65.4%) of the respondents generated a mean income of less than ₦ 1,000,000.00 from fish farming enterprises per annum.

Table 2 shows that 87.2% of the respondents sourced extension information from the ADPs while very few (0.9%) sourced from NGOs. This implies that ADP in Ogun state are still the main extension arm of the government through which innovation are disseminated to farmers.. . Most (93.2%) of the respondents were aware of the presence of extension workers in the study area. This means that the likelihood of the respondents to have access to appropriate innovation at the right time during the production season is high. The extension information was disseminated mainly through the group method (53.8%), followed by the individual method (33.3%). This revealed that group dynamism still exist in the study area, meaning large clients will be reached at a time and focus group

Table 1: Percentage distribution of the socio economic characteristics of the fish farmers (N = 117)

Variables	Freq	%	Mean	SD	SE
Age (Years)					
=20	0	0.0			
21 – 30	10	8.7			
31 – 40	33	19.2			
41 – 50	43	36.9	46.59	9.85	0.91
51 – 60	33	28.2			
61 & above	8	7.0			
Sex					
Male	79	67.5			
Female	38	32.5			
Marital status					
Single	15	12.8			
Married	89	76.1			
Divorced	4	3.4			
Widowed	9	7.7			
Education level					
Complete Primary education	16	13.7			
Uncompleted secondary education	4	3.4			
Completed secondary education	69	59.0			
Uncompleted tertiary education	2	1.7			
Completed tertiary education	26	22.2			
Household size					
1 – 5	53	45.3			
6 – 10	55	47.1			
11 – 15	9	7.7	6.32	3.0	0.27
16 – 20	1	0.9			
Fish farming experience					
1 – 5	69	59.0			
6 – 10	39	33.3			
11 – 15	5	4.3			
16 – 20	2	1.7	5.96	4.19	0.39
21 – 25	1	0,9			
26 – 30	1	0.9			
Mode of fish farming practices					
Full time	34	29.1			
Part time	83	70.9			
Cooperative societies					
Membership	31	26.5			
Non membership	86	73.5			
Total income (₦)					
= 1,000,000	65	55.6			
1,000,001 – 2,000,000	15	12.8			
2,000,001 – 3,000,000	10	8.5			
3,000,001 – 4,000,000	6	5.1	1,741,578.1	2,372,420.9	224,172.7
4,000,001 – 5,000,000	8	6.8			
5,000,001 – 6,000,000	2	2.5			
6,000,001 – 7,000,000	11	9.4			

Source: Field survey, 2013

survey/discussion shall be effective. Most (90.6%) had contact with extension workers fortnightly. This indicates that fisheries extension is at the centre of extension activities of ADP in Ogun State. Olaoye and Oloruntoba (2010) found that farmers that enjoyed frequent contact from extension agents adopted appropriate innovation more regularly. The improved technologies reached the respondents more often through oral and practical demonstration (95.7%).while 62.4 percent of the farmers perceived the teaching capability of the extension personnel as "very good".

Table 3 shows that demonstration using Small Plot Adoption Trial (SPAT) was mostly preferred by the fish farmers while

Table 2: Factors facilitating extension services available to the respondents (N = 117)

Variables	Freq	%
Source of information on fish farming		
ADPs	102	87.2
Ministry of Agriculture	3	2.6
NGOs	1	0.9
Friends and relatives	5	4.3
ADP and Universities	1	0.9
ADP and Ministry	2	1.7
ADP and NGOs	3	2.6
Awareness of extension agents		
Aware	109	93.2
Not Aware	08	6.8
Fish farming message dissemination methods		
Individual	39	33.3
Group	63	53.8
Integrated	1	0.9
Individual and group methods	14	12.0
Extension workers contact/visits		
Fortnightly	106	90.6
Monthly	1	0.9
Occasionally	4	3.4
I do not know	6	5.1
Perceived Teaching ability of extension workers		
Very good	73	62.4
Good	37	31.6
Fair	1	0.9
Poor	6	5.1
Extension demonstration		
Yes	112	95.7
No	5	4.3
Usefulness of demonstrated technology		
Extension agents aided fish farm decision		
Very often	90	76.9
Often	20	17.1
Never	7	6.0
Manner of new technology introduction		
Orally	0	0.0
Practical demonstration	5	4.3
Both	112	95.7

Source: Field survey, 2013

fish input sourcing and farm record keeping ranked 2nd and 3rd respectively. However, the least enjoyed service by the fish farmers is linkage to credit sources (9th). Although technology adoption is synonymous with practical demonstration, however, credit availability to farmers is important for enterprise development. Therefore, extension services made available to farmers should have credit acquisition, savings and investment component. This will enhance fisheries development in the area.

Table 4 presents the results of budgetary analysis for evaluating the costs and returns in relation to factors facilitating extension services available to fish farmers in Ijebu Ode Agricultural Extension zone, Ogun state. The total fixed costs (N88,730.94) and total variable costs (N1,339,614.94) gave rise to total costs (N1,428,344.94) which eventually produced total revenue of N1,741,578.00 and net farm income of N313,233.06 per production cycle during the 2012//2013 production season. The findings from the cost structure shows that the total variable cost accounted for 78.85% of the total cost, while the total fixed cost was analyzed to be 6.21%. Moreover, the fish feed consumed constitute 78.85% of the total cost. This was in line with the findings by Olaoye *et al*., 2012 that fish feeds constituted over 70% of total cost of fish production under intensive management. The profitability ratio in Table 4 shows that Benefit cost ratio was 1.22, rate of return was 0.22 and net profit margin was 0.18. This means the fish farming enterprises was viable.

Table 5 shows that the most (82.1%) prevailing obstacles to extension services availability was loans and credits with high interest rates, followed by poor financial status of the farmers (76.9%) this implies that fish farmers were hindered by non-attendance of organized paid training workshops and purchase of relevant training manuals as well as visit to extension organization for assistance while the least was negative attitude of extension workers (4.3%). This implies that the respondents operated on small scale level of production and at subsistence level. Therefore, farmers will need a lot of financial inputs to convert the knowledge and skills acquired through extension

Table 3: Fish farmers' preferences for the factors facilitating extension services available in the study area

Variables	Available	Not available	Rank according to preferences
Credit Facilities	34 (29.1)	83 (70.9)	9th
Fishing Input Market	103 (88.0)	14 (12.0)	2nd
Health talk	85 (72.6)	32 (27.4)	5th
Capacity building	58 (49.6)	59 (50.4)	7th
Saving & investment	49 (41.9)	68 (58.1)	8th
Farm record keeping	95 (81.2)	22 (18.8)	3rd
Literacy	86 (70.5)	31 (26.5)	6th
Environmental management practices	93 (79.5)	24 (20.5)	4th
Demonstration/SPAT	107 (91.5)	10 (8.5)	1st

Source: Field survey, 2013

Table 4: Costs and returns in relation to factors facilitating extension services available to fish farmers (N = 117)

Variables	Amount (<)	% total Cost
Fixed Cost		
Land	2,890	3.23
Water pump	10,960	12.35
Tanks construction	24,780.49	27.93
Plumbing materials	1,860	2.09
Deep well	464.68	0.53
Buildings	5,379.23	6.06
Drag net	9,704.76	10.94
Shovel/spade (Steel)	1.708.08	1.93
Wheel barrow	6,782.61	7.64
Steel Cutlass	1,642.47	1.85
Weighing scale	10,518.95	11.85
Generator	9,647.06	10.87
Net fencing	2,392.61	2.69
Total fixed cost	88,730.94	6.21
Variable Cost		
Fish seed	67177.78	5.01
Fish feed	989238.7	78.85
Lime	103706.3	7.74
Fertilizer	22273.02	1.66
Bowls etc	14916.67	1.11
Labour	33631.37	2.51
Land/pond/tank preparation	50082.31	3.74
Transportation	36091.84	2.69
Fuel/electricity	11638.03	0.87
Others	10857.73	0.81
Total variable cost	1,339,614	93.79
TOTAL COST	1,428,344.94	
TOTAL REVENUE	1,741,578	
GROSS MARGIN	401,964	
NET FARM INCOME	313,233.06	
BENEFIT COST RATIO	1.22	
RATE OF RETURN (ROR)	0.22	
NET PROFIT MARGIN (NPM)	0.18	

Source: Field survey, 2013

workers to production.

Moreover, 66.7 percent pointed out that unstable government policy poses a severe threat to fish farmers in the study area. Therefore, government should put in place farmer friendly policies that will enhance the performance of fish farmers in order to fight the menace of malnutrition in Nigeria through fish production.

Table 6 revealed a significant association between factors facilitating extension services utilized by farmers with marital status (χ^2 = 29.670, $p < 0.05$) and educational level (χ^2 = 22.625, $p < 0.05$).

Table 5: Constraints to extension services availability in the study area (N = 117)

S/N	CONSTRAINTS	SEVERITY			
		Very serious (4)	Serious (3)	Not a problem (2)	I don't know (1)
1.	Unstable Government policies on agriculture	78 (66.7)	34 (29.1)	5 (4.3)	-
2.	Inadequate number of extension workers	13 (11.1)	16 (13.7)	77 (65.8)	11 (9.4)
3.	Inadequate provision of basic/social amenities	37 (31.6)	66 (56.4)	14 (12.0)	-
4.	Poor financial status of the farmers	90 (76.9)	23 (19.7)	4 (3.4)	-
5.	Distance of extension organization to farmer's home	9 (7.7)	9 (7.7)	85 (72.6)	14 (12.0)
6.	Negative attitude of extension workers	5 (4.3)	2 (1.7)	83 (70.9)	27 (23.1)
7.	Inadequate mobility for extension workers	23 (19.7)	68 (58.1)	14 (12.0)	12 (10.3)
8.	Hostile environment/ community conflict	24 (20.5)	49 (41.9)	27 (23.1)	17 (14.5)
9.	Loans & credits with high interest rates	96 (82.1)	19 (16.2)	2 (1.7)	-
10.	Transportation problems	57 (48.7)	55 (47.0)	5 (4.3)	-
11.	Inadequate number of Agricultural education workers	8 (6.8)	64 (54.7)	27 (23.1)	18 (15.4)
12.	Unfavourable climatic conditions	35 (29.9)	67 (57.3)	11 (9.4)	4 (3.4)
13.	Socio cultural barriers	22 (18.8)	16 (13.7)	73 (62.4)	6 (5.1)
14.	Natural hazard/environmental degradation	24 (20.5)	71 (60.7)	12 (10.3)	10 (8.5)
15.	Illiteracy/inadequate education	24 (20.5)	69 (59.0)	22 (18.8)	2 (1.7)

Source: Field survey, 2013

Moreover, the result of correlation analysis shows that, there was no significant relationship between nature of extension service utilized by fish farmers and their age ($r = 0.012$, $p < 0.05$), years of experience ($r = 0.074$, $p < 0.05$) and house hold size ($r = 0.033$, $p < 0.05$).

Table 7 reveals a significant association between the factors facilitating agricultural extension services available to fish farmers and their output level (($\chi^2 = 173.088$, $p < 0.05$)). This implies that extension organizations should encourage services that will promote fish farmers' socioeconomic status in order to improve their living standard and profitability. Therefore, extension agencies should be wary of services that will enhance farmers' socio economic status and continued to provide same to them.

Table 8 reveals a significant association between farmers' preferences of factors facilitating agricultural extension services available to fish farmers and their output level. This implies that fish farmers in the area have continued preferences to utilize extension services that had the propensity for improving their profit levels. Therefore, extension agencies should be specific about extension of services that the farmers use more in order to improve more on them to enhance innovation adoption.

Conclusion and recommendations

The study found the factors facilitating extension services available to the fish

Table 6: Analysis of respondent's socio-economic characteristics and nature of extension services utilized by fish farmers

Variables	χ^2	Df	CC	Decision
Sex	6.484	3	0.090	NS
Marital status	29.670	9	0.000	S
Educational level	22.625	12	0.031	S
Variables	**R**		**P**	**Decision**
Age	0.012	0.897		NS
Household size	-0.074	0.440		NS
Years of experience	0.033	0.733		NS

Source: Field survey, 2013

NS = Not significant, S = Significant ($p > 0.05$), χ^2= chi square calculated, df = Degree of freedom, CC = Contingency Coefficient.

farmers in Ijebu Ode Agricultural Extension zone of Ogun State as both from governmental and non-governmental organizations. Governmental organizations in extension service include; ADPs, IDBPR, and the Ministry of agriculture while the Non Governmental extension service provider is mainly JDPC. Most fisheries extension service provided to farmers was through the ADP and the method demonstration was found most useful. Despite the activity of the ADP, financial/credit acquisition issues were not treated by the ADP and this has continued to constitute a major constraint to fish farmers in the study area. Farmers have poor financial status and were faced with the problem of high interest rate from money lending organizations, agencies and cooperative societies. This situation was further worsened by unstable government policies on agriculture; inadequate provision of basic/social amenities, inadequate mobilizes for extension workers, unfavourable climatic condition and socio cultural barriers.

There was found a significant association between factors facilitating extension

Table 7: Chi-square analysis of the nature of extension service available and output (Profit) of the fish farmer

Variables	χ^2	Df	CC	Decision
Output (Profit)	173.088	144	0.05	S

Source: Field survey, 2013

χ^2= chi square calculated, df = Degree of freedom, CC = Contingency Coefficient, S = Significant, NS = Not significant ($p < 0.05$).

Table 8: Chi-square analysis preference of factors facilitating extension service available and output (Profit) of the fish farmer

Variables	χ^2	Df	CC	Decision
Output (Profit)	167.626	24	0.00	S

Source: Field survey, 2013

χ^2= chi square calculated, df = Degree of freedom, CC = Contingency Coefficient, S = Significant, NS = Not significant ($p < 0.05$).

services available to fish farmers, their marital and educational status. However, no significant relationship was found between the factors facilitating extension services available and their age, years of experience and house hold size. Thus, this study recommends that;

i. Extension services should include the better linkage of fish farmers to credit sources with "pocket friendly interest rates".

ii. Government should enact laws that will be favourable to increased agricultural/fish production while at the same time providing basic/social amenities to rural and peri-urban areas where fish producers reside. This will help to increase fish production and thereby solve bridge the production gap and curb the menace of malnutrition in Nigerian society.

iii. Extension service should be properly funded by government and remunerated of extension personnel for enhanced performance.

iv. Favourable government policy on agriculture.

References

Alamu, S. O., Abiodun, J. A., Miller, J. W. 2004. .Food security and poverty alleviation under the national special programme for food security. A preliminary socio-economic assessment of Yamama Lake, Kebbi state, Nigeria. Proceedings of the 19th Annual Conference of the Fisheries Society of Nigeria Ilorin, 29th Nov to 3rd December, edited by P. A. Araoye. Pp.149-162.

Bada, T.,Rahji, M. A. Y. 2010. Market delineation study of the fish market in Nigeria: An Application of Cointegration Analysis. *Journal of Agricultural Science,* 2, 3, 158-168.

Bonye, S. Z., Alfred, K. B., Jasaw, G. S. 2012. "Promoting Community-Based Extension Agents as an Alternative Approach to Formal Agricultural Extension Service Delivery in Northern Ghana", *Asian Journal of Agriculture and Rural Development,* 2, 1, 76 – 95.

DFID 2001. "Joining up donors< approaches to small and medium enterprise development", a discussion document for the small enterprise development's annual conference, Stockholm, DFID, London, UK. 97pp

Okwu, O. J., Acheneje, S. 2011: Socio-Economic Analysis of Fish Farming in Makurdi Local Government Area, Benue State, Nigeria. *European Journal of Social Sciences* – Vol. 23, 4, 508 – 514.

Oladele, O. I. 2001: Activities in Research-Extension-Farmers Linkage System in Southwestern Nigeria. *Journal of Extension Systems.* 17, 2,63-75.

Oladoja, M. A.,Adeokun, O. A. 2013. Assessment of market performance of cat fish farmers in Sagamu local government area of Ogun state, Nigeria. Nigeria *Journal of Animal Production,* 40, 1, 207 – 217.

Olaoye, O. J., 2010: Dynamics of the Adoption Process of Improved Fisheries Technologies in Lagos and Ogun States Nigeria. A Ph. D thesis in the Department of Aquaculture and Fisheries Management, University of Agriculture, Abeokuta, Ogun State, Nigeria. 337pp.

Olaoye, O. J.,Oloruntoba, A. 2010: Determinant of aquaculture technologies adoption among fish farmers in Obafemiowode Local government area of Ogun state, Nigeria. *Journal of Humanities,*

Social sciences and Creative Arts, 5, 1, 37 -48.

Olukosi, J. O.,Ehabor, P. O. 1988: Introduction to Farm Management Economics Principles and Applications. Agtab Publishers Limited Zaria, Nigeria. Pp. 77 – 88.

Rahji, M. A.Y., Popoola, L.,Adebisi, L. A. 2001: Analyses of the Demand for and Supply of Fish in Nigeria 1986-1997. *Journal of West African Fisheries*, 10, 543-550.

Sanni, A. O. 2009: Analysis of socio economic and institutional factors affecting adoption of aquaculture technologies in two local government areas of Kaduna state. MSc. Dissertation, Ahmadu Bello University, Samaru, Zaria. 211pp.

Yahaya, M. K. 2003: Development Communication: Lessons from Change and Social Engineering projects. Corporate Graphics Ltd, Ibadan. 240p.

Received: 10th April, 2014
Accepted: 21st August, 2014