DOI: http://dx.doi.org/10.4314/star.v4i2.44
ISSN: 2226-7522(Print) and 2305-3372 (Online)
Science, Technology and Arts Research Journal
Sci. Technol. Arts Res. J., April-June 2015, 4(2): 316-323
Journal Homepage: http://www.starjournal.org/

Original Research

Determinants of Value Addition Initiatives Use by Fish Farmers in Kwara and Kogi States, North Central Nigeria

Olorunfemi, O.D[1]*, Adesiji, G.B[1,3], Oladipo, F.O[1], Adisa, R.S[1,2], Daudu, A.K[1], Suweba, G[2]

[1]Department of Agricultural Extension and Rural Development University of Ilorin, Ilorin, Nigeria

[2]Department of Agricultural Extension and Rural Development, Usumanu Danfodiyo University, Sokoto, Nigeria

[3]Department of Agricultural Economics and Extension Technology, Federal University of Technology, Minna, Nigeria

Abstract

The paper examines the activities of fish farmers as it relates to their use of value addition initiatives in fish farming and highlights the determinants of use of these initiatives in Kwara and Kogi States, Nigeria. A well-structured interview schedule was used to elicit information from two hundred and twenty respondents selected using a two-stage sampling technique. The findings indicated that the fish farmers fall into the economically active age group with a mean age of 44.1 years, majority (75.5%) were males, married (78.2%) and had one level of formal education or the other (83.1%). The respondents value addition initiatives use profile was still very low among the respondents and t-Test analysis revealed that there was no significant difference (even at 5 percent level of significance) in the level of use of value addition initiatives among the two constituent States of Kwara and Kogi. Logistic regression model of determinants of value addition initiatives use revealed that characteristics of household that were more likely to use value addition initiatives include the younger fish farmers; with larger household size; higher educational qualification; higher percentage contribution of fish farm income to total income and those with more years of fish farming experience. The study recommends an urgent need to package robust training programmes and advisory services for fish farmers by extension and other stakeholders and amelioration of the highlighted severe constraints in order to enhance their use of value added initiatives thereby making them to be able to tap into all the available potentials that exist in the aquaculture sector.

Article Information

Article History:

Received : 19-03-2015

Revised : 23-05-2015

Accepted : 09-06-2015

Keywords:

Determinants

Fish Farmers

Nigeria

Value addition Initiatives

***Corresponding Author:**

Olorunfemi, O.D

E-mail:

davidsoa2003@yahoo.com

INTRODUCTION

Fish farming continues to be the fastest growing animal food-producing sector and it out-pace population growth (FAO, 2011). It has been established that the livelihoods of millions of people worldwide are dependent on fish farming and that the fishery industry is crucial to the world economy (Greenfacts, 2004; Nwachukwu and Onuegbu, 2007). World aquaculture has grown dramatically in the last 50 years. From a production of less than 1 million tons in the early 1950s, production in 2006 was reported to have risen to 51.7 million tones, with a value of US$78.8 billion. This means that aquaculture continues to grow more rapidly than other animal food-producing sectors.

While capture fisheries production stopped growing around mid-1980, the aquaculture sector has maintained an average annual growth rate of 8.7 percent worldwide (excluding China, 6.5 percent) since 1970 (FAO, 2011). Annual growth rates in world aquaculture production between 2004 and 2006 were 6.1 percent in volume terms and 11.0 percent in value terms. In 2006, countries in the Asia and the Pacific regions accounted for 89 percent of production by quantity and 77 percent of value. Of the world total, China is reported to produce 67 percent of the total quantity and 49 percent of the total value of aquaculture production (FAO, 2011). ICLARM (2001), reported that aquaculture appear to be one of the last frontiers to increase contribution to food security in the developing world and it now represents the fastest growing agricultural industry in some countries, with fresh water aquaculture dominating total aquaculture production.

Fisheries occupy a unique position in the agricultural sector of the Nigerian economy. The contribution of the fisheries sub-sector to agriculture GDP was estimated as 4.0% in the year 2007, out of the total estimate of 40% being contributed by agriculture to GDP (FDF, 2008). Fish demand in Nigeria is put at about 1.2 million metric tons per annum, and the total domestic fish production can

only supply 511,700 metric tons, leaving a shortfall of 680,000 metric tons of fish annually (Nwankwo, 2005). This therefore opens up a multitude of possibilities and opportunities for Nigerian fish farmers. Despite the large available market for fishery and aquaculture products, many subsistence fish farmers still encounter difficulties in selling their products profitably. Several visible pointers have revealed that a major reason why fish farmers seem not to have been able to harness the potential in the sector is due to the inadequate use of value addition initiatives.

Value addition initiatives define the agribusiness chain which encompasses production, processing, preservation/storage and marketing of an agricultural produce. It entails the transformation of an agricultural product into forms with higher value and diversified utilities. Such transformation creates utilities in time, location and form. It is the creation of time, location and form utilities that characterizes value adding (Ezike, Nwibo and Odoh, 2011). The potential of value addition initiatives within the agricultural sector is enormous. According to Dunlap (2006), apart from improving the profit potentials of farmers, value addition initiatives offer entrepreneurial farmers an opportunity to identify and pursue new products and new markets. The relatively underdevelopment of value addition initiatives in fish farming in Nigeria seems to be critically affecting the maximization of the prospects in the sector which the huge gap between demand and supply generates.

Therefore, there is the need to examine the activities of fish farmers as it relates to their use of value addition initiatives in fish farming right from production to marketing and highlight the factors determining the respondents use of these initiatives so as to speed-up efforts and properly refocus strategies employed by extension in developing advisory extension services on value addition initiatives in its various forms in the sector. To this end, the study sought to specifically describe the socio-economic characteristics of the fish farmers in Kwara and Kogi States, examine the value addition initiatives use profile of the fish farmers in the study area, determine the factors influencing their use of value addition initiatives in fish farming and identify the constraints to value addition initiatives in fish farming in the study area.

MATERIALS AND METHODS

The study was conducted in Kwara and Kogi States. These states are located in the North-Central geopolitical zone (middle-belt) of Nigeria in the areas that extend roughly from latitude ($6^0 30^1$ to $11^0 05^1$) north of the equator and longitude ($2^0 5^1$ to $7^0 45^1$) east of the prime meridian. This area is largely located in the savannah region of Nigeria. It is an ecological transition zone between the arid north and the moist south with temperature fluctuating between 30^oC – 37^oC in the year and rainfall of 1000 to 1500 mm annually. Kwara State covers an area of 36,825 square kilometres and has a population of about 2,365,353 while Kogi State on the other hand covers an area of 29,833 square kilometres and has a population of about 2.1 million people (NPC, 2006). Each of the States is divided into 4 zones by the State Agricultural Development Project (ADP) in consonance with ecological characteristics, cultural practices and project administrative convenience. Zones C and D in Kwara State and Zones A and C in Kogi State are the major areas where fish farming is prominent. According to the information obtained from the Kogi State Ministry of Agriculture, Lokoja, only about 2 major LGAs in these zones which are Lokoja and Kabba-Bunu account for about 80% of practical aquaculture in the State.

The target population for this study comprise the fish farmers in Zones C and D and Zones A and C agro-ecological zones of Kwara and Kogi State respectively. These are the zones where fish farming is prominent in the States.

Data collection was carried out with the aid of a well-structured interview schedule. A two-stage sampling technique was employed in the selection of the respondents. A purposive selection of two (2) LGAs each from the two ADP administrative zones (Zones C & D) in Kwara State and selection of one (1) LGA each from the two ADP administrative zones (Zones A & C) in Kogi State where fish farming is prominent and well-practiced based on the information obtained from the States' ADP and Ministries of Agriculture. This allowed for effective coverage of these zones according to the variations that exist in the practice of fish farming in the respective States. Forty (40) fish farmers in Kwara State and Thirty (30) fish farmers in Kogi State constituted an average of about one-third of the fish farmers present in the selected LGAs was randomly selected from the fish farmers' association chapter present in each selected LGA. This gave a total sample size of two hundred and twenty (220) fish farmers.

Data were collected on the socio-economic characteristics of the fish farmers, the factors influencing their use of value addition initiatives in fish farming and the constraints to value addition initiative use among the fish farmers in the study area while the dependent variable was the value addition initiatives use profile of the fish farmers. These variables were measured as follows:

Value Addition Initiative use Profile of the Fish Farmers:

Analysis of the use of Value addition initiatives was carried out using their responses to different initiatives used in fish farming enterprise. Respondents were asked to indicate their value addition initiative use level on six dimension which are production initiatives containing 8 items, pre-processing initiatives containing 5 items, processing initiatives containing 6 items, smoking initiatives containing 8 items, packaging initiatives containing 5 items and marketing initiatives containing 8 items. These six segments contain a total of 40 initiative items that are used in fish farming. Respondents were instructed to indicate their level of use of these items using a 3-point likert scale of Used always (3), Used sometimes (2) and Not Used at all (1). A breakdown of the score in each segment was determined thus: production initiative use score was determined from a range of 8 (lowest) to 24 (highest); processing initiatives (combining pre-processing, processing and smoking initiatives) use score was from 19 (lowest) to 57 (highest); packaging initiative use score was from 5 (lowest) to 15 (highest) and marketing initiative use score was from 8 (lowest) to 24 (highest). The overall Value Addition Initiative Use Score of the respondents was determined from a range of 40 being the lowest level of use to 120 being the highest level of use score possible.

From their responses, the fish farmers were then classified into whether they have a low (non-use) use of value addition initiative or a high use of value addition initiative. Respondents with a total score of 40 – 79 was interpreted as low use of value addition initiatives while those with a score of 80 and above (which is about 50% and above of the total score possible) is considered to represent high value addition initiative use. Logistic regression model of determinants of use of value addition initiative was then estimated to examine factors determining the fish farmers' likelihood to use value added initiative. The logistic regression model is in the form of the ratio of natural logarithm of the probability of high use of value added initiative to the probability of low/non-use of value added initiative (i.e. log odds ratio), can thus be given as;

$$\text{Ln}\left[\frac{\pi}{1-\pi}\right] = \beta^1 X + \epsilon$$

Where π is the conditional probability of a farmers' use of value addition initiative, X is a vector of hypothesized explanatory variables which will include age, gender, marital status, educational level, household size, annual income, annual income from fish farming, fish farming experience, involvement in other occupation, membership of cooperative society, β is a vector of unknown parameters to be estimated and ϵ is independently and normally distributed random error term.

Constraints to Value Addition Initiatives in Fish Farming

A series of items were presented to the respondents and they were asked to rate these items as constraints on a 5-point likert type scale of Very severe (5), Severe (4), Somewhat Severe (3), A little severe (2), Not severe (1).

Data analysis was carried out using descriptive statistics such as frequency counts, percentages, mean scores and ranks. Logistic regression was used to identify the determinants of value addition initiative use while t-Test was used to test whether there is a significant difference between the use of value addition initiatives by respondents in the two states.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Findings from Table 1 revealed that the mean age of the respondents was 44.1 years with a standard deviation of 10.0. This implies that the respondents were generally in their economically active years indicating their ability to leverage on this attribute for a high degree of prospects and viability in value added production. This results agree with that of Adefalu *et al.* (2013) and Egbufor, Onemolease and Erie (2012) who reported that young able bodied men were the ones largely and actively involved in fish farming. This buttress the fact that fish farming also requires a high sense of maturity, vigour and energy which might be difficult for the aged to do. All these conform to the general view that modern fish farming requires people of the active age group (below 51 years) that are strong and have the required skills and knowledge (Adisa, Adeokun and Oladoja, 2006).

The gender of an individual can influence the type and quality of work carried out by the individual. The results obtained from the study indicated that there were more males (75.5%) involved in fish farming than females (24.5%). This is in agreement with Falola, Banjoko and Ukpebor, 2012; Olaoye and Oloruntoba (2011) and Ogunlade (2007) who revealed that males were mostly involved in fish farming than females. This can be attributed to the tedious nature of fish farming particularly in the aspect of culturing, as noted by Okonji and Bekerederemo (2011).

As further revealed in Table 1, majority (78.2%) of the respondents were married. This agrees with Egbufor *et al* (2012) and Olaoye and Oloruntoba (2011) who also reported similar trends in their study. The implication of this is that most of the fish farmers have family responsibility ties that will require more financial commitment which may serve as an impetus for them to adopt recommended fish farming practices that can enhance more income.

The household size is a determinant in production, consumption and income. In traditional agricultural economy, household size plays a significant role and provides the easiest avenue for reduction in labour cost through the use of family labour supply. Table 1 showed that majority (63.2%) of the respondents had a household size of 5 – 8 persons. The mean household size of 6 persons for the study is a little higher than the average persons per rural household as established by the National Bureau of Statistics (NBS) (2006). The implication of this is that respondents have dependent and are with great family responsibilities. This is in consonance with the report of Olapade and Adeokun (2005) where most of the fish farmers in Oyo State were also married with dependents.

Majority (83.1%) of the respondents were literate while the remaining 16.8% had no formal education. This suggests that fish farming is dominated by literate persons. The result agrees with Adefalu *et al.* (2013) and Ogunlade (2007) where they stated that most of the fish farmers in Kwara and Osun State, Nigeria respectively had formal education. Also Riddler and Hishamunda (2001) reported a similar result. They found out that successful fish farmers in Niger Republic were literate. Being literate will likely confer on the fish farmers' capacity to learn and be positively disposed to relevant information that can enhance their competencies in fish farming and use of value addition initiatives.

Majority (66.4%) of the respondents had 5 years and above fish farming experience while the remaining few (33.6%) had 4 years or less experience in fish farming. The mean years of fish farming experience of the constituent States ranges between 6.3 years in Kwara State and 8.9 years in Kogi State. On the average, the fish farmers have been into fish farming for 7 years with a standard deviation of 3.8. This shows that majority of the respondents had some level of experience in fish farming. As revealed by Riddler and Hishamunda (2001), experience is a risk management factor in fish farming. They opined that new entrants into the aquaculture sector are at a higher risk compared to experienced fish farmers.

Table 1: Socio-economic characteristics of respondents

Socio-economic Characteristics	Frequency	Percentage (%)	Mean	Std. Dev.
Age (Yrs.)				
≤ 30	18	8.2	44.1	10.0
31 – 40	81	36.8		
41 – 50	58	26.4		
51 – 60	51	23.2		
> 60	12	5.5		
Gender				
Male	166	75.5		
Female	54	24.5		
Marital Status				
Single	33	15.0		
Married	172	78.2		
Widowed	8	3.6		
Seperated	7	3.2		
Household Size				
1 – 4	54	24.5	6	
5 – 8	139	63.2		
9 – 12	26	11.8		
> 12	1	0.5		
Educational Level				
No formal Education	37	16.8		
Primary Education	66	30.0		
Secondary Education	63	28.6		
Tertiary Education	54	24.5		
Fish Farming Experience				
≤ 4	74	33.6	7.0	3.8
5 – 9	84	38.2		
10 – 14	51	23.2		
> 14	11	5.0		

Source: Field Survey, 2014 N = 220

Value Addition Initiatives use Profile of the Respondents

Results from Table 2 revealed that majority (73.2%) of the fish farmers had a low value addition initiative use score in fish farming while just a few (26.8%) of the respondents had a high value addition initiative use score. A more critical assessment of table 2 with focus especially on the constituent States of the study showed that their seems to be a higher level of use of value addition initiatives among the sampled respondents in Kwara State (29.4%) than that found in Kogi State (20.0%). The mean value addition initiatives use score for the study was 65.5 (score ranges from 40 minimum – 120 maximum) signifying a low use of value addition initiative among the respondents. This result agrees with Nwachukwu and Onuegbu (2007) who also reported a low use of fish technologies by fish farmers in Nigeria. The implication of this is that most of the fish producers in the study area make use of very little ideas, innovations, technologies and strategies that can bring about time, form or place improvement in their processes and products which are capable of increasing the proportion of income accrued to them. This may be a pointer to why the farmers are experiencing stagnation in their income in this sector.

Table 2: Distribution of Respondents according to their total value added initiative use level in fish farming production

Value Added (VA) Initiative Use Level	Kwara		Kogi		Pooled	
	Freq	Per.(%)	Freq	Per.(%)	Freq	Per.(%)
Low VA Initiative Use (40 – 79)	113	70.6	48	80.0	161	73.2
High VA Initiative Use (80 – 120)	47	29.4	12	20.0	59	26.8
Total	**160**	**100.0**	**60**	**100.0**	**220**	**100.0**

Source: Field Survey, 2014.

Cross Tabulation of Respondents Fish Growth Period and their Use of Value Added Initiative Score at the Production Stage

Table 3 revealed that majority (70.9%) of the respondents were categorized to have a very low value addition initiative use score at the production stage while just about 29.1% had a high production-stage value addition initiative score. The table further showed that a little above one-third (38.6%) of the respondents cultured their fish to table size between 5 – 6 months, 33.2% cultured their fish to table-size above 6 months while only a few (28.2%) were able to culture their fish to table size between 3 – 4 months. The interface of the two variables revealed that fish farmers that had low value addition initiative use score at the production stage are more likely to have their fishes growing to table-size at 5 months and above while those that had a high value addition use score at the production stage are more likely to culture their fish earlier within 3 – 4 months. The implication of this is that having a high production value addition initiative use score and fish culture time to table-size are directly related. Fish farmers with high production value

addition use score can have a higher turnover (about 3 times) of their products to the market within a year which will translate to more income for them.

Table 3: Cross tabulation of Respondents Fish Growth Period and their Use of Value Added Initiative Score at the Production Stage

Production Value Added (VA) Initiative Score	Fish Growth Period			Total
	>6 months	5 – 6 months	3 – 4 months	
Low VA Prod. Score (8 – 15)	73 (33.2)	83 (37.7)	0 (0.0)	156 (70.9)
High VA Prod. Score (16 – 24)	0 (0.0)	2 (0.9)	62 (28.2)	64 (29.1)
Total	73 (33.2)	85 (38.6)	62 (28.2)	220 (100.0)

Source: Field Survey, 2014.

Note: The values in parenthesis represent the percentage while the value outside represent the frequency.

Factors determining the Use of Value Addition Initiatives in Fish Farming

Ten factors were hypothesized as factors determining fish farmers' likelihood to use value added initiatives. These factors were Age (X1), Gender (X2), Marital Status (X3), Household Size (X4), Educational Level (X5), Other Occupation (X6), Cooperative Societies (X7), Annual Income (X8), Fish Farm Income (X9) and Fish Farming Experience (X10).

Result of the logistic regression as presented in table 4 revealed that the coefficient of Age (X1), Household Size (X4), Educational Level (X5), Fish farm income (X9) and Fish farming experience were significant at 5 percent level of significance implying that these factors significantly determine farmers' likelihood to Use Value Addition Initiatives. The remaining variable coefficients including that of Gender (X2), Marital Status (X3), Other occupation (X6), Cooperative Society ((X7) and Annual income (X8), are not significant even at 10 percent level of significance implying that these factors do not significantly affect fish farmers' likelihood to use value addition initiatives.

There is a positive relationship between the fish farmers' value addition initiative use status and the coefficient of household size, educational level, fish farming income, and years of fish farming experience implying that these variables increase fish farmers' likelihood to use value addition initiatives. On the other hand, there is a negative and significant relationship between the fish farmers' value addition initiative use status and the coefficient of age. This variable therefore decreases fish farmers' likelihood to use value addition initiatives.

An increase in Age (-3.106) tends to limit the fish farmers' likelihood to use value addition initiatives. This is evident considering the mean age of the respondents which is 44.1 years. It reveals that most of the farmers were already in their middle age category and this attribute usually might make them to be more conservative and less innovative thus reducing their tendency and willingness to want to try new things and prospects. This agrees with Nwaru, Onuoha, Iheke and Onyeachonam (2010) who noted that the mental capacity of an individual to cope with innovations decreases with advancing age.

Household size (3.197) has a positive and significant influence on fish farmers' likelihood to use value addition initiatives implying that an increase in household size tends to increase farmers' likelihood to use value addition initiatives. Most of the farmers in the area have fairly large household size considering their mean household size of 6 members which might likely provide family labour that can render less costly services as it regards the use of value added production, processing, packaging and marketing initiatives in fish farming thereby increasing the net gain of the farmers through reduction in cost of hired labour and increased accrued income through supply of value added products and services.

An increase in the educational level (2.852) of the fish farmers increases the farmers' likelihood to use value addition initiatives. Majority of the respondents being literate will most likely contribute positively to their information seeking behaviour. The ability to read and write will enhance the fish farmers' capacity to learn and be positively disposed to learning new competencies relating to value addition initiatives and adopting them.

Fish farm income (2.973) has a significant and positive influence on respondents likelihood to use value addition initiatives because most of the fish farmers that had a high value addition initiative use score were those who had a relatively high percentage contribution of fish farm to their total annual income thus indicating that the higher the income from fish farming, the more likely the motivation to adopt and use value added initiatives that will enhance more income from the enterprise.

The years of fish farming experience (2.445) has a positive and significant relationship with the farmers' use of value added initiatives. An increase in the number of years of farming experience increases the farmers' likelihood to use value added initiatives. Considering the 7 years average fish farming experience obtainable in the area, most of the fish farmers are not new entrant into the enterprise. This relatively long time experience is supposed to grant them the opportune exposure to the trend of inflow and outflow in the business thus allowing them to acquire enough skills that will enhance their capacity for a better output so as to gain more income from the enterprise.

In summary, results from the logistic model revealed characteristics of fish farmers that are more likely to use value addition initiatives: those that are younger in age, those with larger household size, those with higher educational qualification, those with higher percentage contribution of fish farm income to total income and those with more years of fish farming experience.

Table 4: Logistic regression results indicating factors determining respondents likelihood to use value addition initiatives

Factor	Regression co-efficient	Standard Error	T – value
Age X_1	-3.106*	1.488	0.037*
Gender X_2	0.881	0.999	0.377
Marital Status X_3	-0.722	0.557	0.194
Household Size X_4	3.197*	1.166	0.006*
Educational level X_5	2.852*	0.793	0.000*
Other Occupation X_6	0.159	0.266	0.549
Cooperative Society X_7	0.685	0.852	0.422
Annual Income X_8	-0.518	0.394	0.189
Fish Farm Income X_9	2.973*	0.776	0.000*
Fish Farming Experience X_{10}	2.445*	0.837	0.004*
Model Chi-square	194.444		
-2 log likelihood for the model	61.391		
Overall case corrected predicted	95.0%		

*co-efficient significant at 5 per cent
Source: Analysis of Field Survey Data

Constraints to Value Addition Initiatives in Fish Farming

Table 5 revealed the constraints the fish farmers encounter in their use of value addition initiatives. Using mean score to rank the constraints items according to their order of severity as indicated by the respondents, "Inadequate access to capital and finance" (MS = 4.45), "High prices of inputs" (MS = 4.40), "Poor extension and capacity building services" (MS = 4.37), "Difficulty in getting good fish seeds" (MS = 4.16), "Inadequate communication between extension agents and fish farmers" (MS = 4.01), "Unstable government policies" (MS = 3.96) and "Lack of equipments and tools" (MS = 3.51) were very severe constraints as they ranked 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th respectively. The table further showed that the other listed constraint items whose mean score were below 3.5 were of lesser severity to the fish farmers in the study area. Some of the constraint items indicated as severe by the respondents in the study area agree with Adefalu *et al.* (2013) where they reported the lack of sufficient capital as a major challenge in fish farming. Ogunlade (2007) also revealed that the major constraints facing fish farmers were capital, security, feeds and fingerlings procurement. Similarly, Egbufor *et al.* (2012) also indicated that part of the major constraints facing fish farmers was unavailability of fingerlings as at when due and inadequate credits. The implication of all these is that the fish farmers' in the study area needs an urgent intervention from government and stakeholders on these severe challenges militating against their use of value addition initiatives. This will enhance the transformation of the aquaculture sector into a more profitable enterprise thus encouraging lots of old and new entrant fish farmers to tap into the potentials in the sector.

Table 5: Constraints to value addition initiatives in fish farming

Constraints	Very Severe	Severe	Somewhat Severe	A little Severe	Not Severe	Mean Score	Rank
Poor extension & capacity building services	107(48.6)	96(43.6)	12(5.5)	1 (0.5)	4 (1.8)	4.37	3rd
Inadequate access to capital and Finance	130 59.1)	73 33.2)	7 (3.2)	6 (2.7)	4(1.8)	4.45	1st
Inadequate entrepreneurial skills	29 (13.2)	61(27.7)	100 (45.5)	25 (11.4)	5 (2.3)	3.38	9th
Difficulty in getting good fish seeds	96 (43.6)	85 38.6)	26 (11.8)	5 (2.3)	8 (3.6)	4.16	4th
Inadequate communication between extension agents & fish farmers	92 (41.8)	68 30.9)	38(17.3)	15(6.8)	7 (3.2)	4.01	5th
Language barrier between extension agents and the farmers	4 (1.8)	8(3.6)	30 (13.6)	99 (45.0)	79 (35.9)	1.90	17th
Unstable electricity and high electricity tariffs	34 (15.5)	55(25.0)	92 (41.8)	26 (11.8)	13(5.9)	3.32	11th
High prices of inputs	113 51.4)	95 43.2)	4 (1.8)	3(1.4)	5 (2.3)	4.40	2nd
Lack of equipment and tools	39 (17.7)	60 27.3)	100 (45.5)	17 (7.7)	4 (1.8)	3.51	7th
Lack of technical know how	34 (15.5)	62(28.2)	96(43.6)	20(9.1)	8(3.6)	3.43	8th
Unstable government policies	73 (33.2)	99(45.0)	22(10.0)	18(8.2)	8(3.6)	3.96	6th
Inadequate market channels and networks	24 (10.9)	48(21.8)	120 (54.5)	23(10.5)	5(2.3)	3.29	13th
Unavailability of good water source	26 (11.8)	79 35.9)	75 (34.1)	30 (13.6)	10 (4.5)	3.37	10th
Weak prices and consumers perception about farmed fish	24 (10.9)	45 20.5)	100 (45.5)	35 (15.9)	16(7.3)	3.12	14th
Poor transportation facilities and network	17(7.7)	26 11.8)	87 (39.5)	60(27.3)	30(13.6)	2.73	15th
Poor GSM communication network	5 (2.3)	15 (6.8)	29(13.2)	92(41.8)	79 (35.9)	1.98	16th
Problem of middlemen	36 (16.4)	67(30.5)	72(32.7)	23 (10.5)	22 (10.0)	3.32	11th

Mean Score derived from VS=5, S=4, SS=3, LS=2, NS=1; N=220
Note: The values in parenthesis represent the percentage while the value outside represent the frequency.
Source: Field Survey, 2014.

Independent Sample t-test for Difference in Value Addition Initiatives Use by Fish Farmers in Kwara and Kogi States, Nigeria

An independent sample t-test was conducted to compare the use of value addition initiative use in Kwara and Kogi States, Nigeria. Table 6 revealed statistically that there was no significant difference between the value addition initiative use profile of fish farmers in Kwara State (M = 65.56, SD = 18.228) and fish farmers in Kogi State (M = 65.15, SD = 15.207). The implication of this is that none of the two states is better-off than the other in their use of value addition initiatives. The use of value addition initiatives in both constituent states of the study is still low and thus the capacity of the fish farmers need to be enhanced especially in the areas of high capacity need indicated and the constraints militating against its use removed thereby proffering solutions for a more profitable regime for the fish farmers in the two states.

Table 6: Independent Sample t-test for difference in value addition initiatives use by fish farmers in Kwara and Kogi States, Nigeria

	State	Mean	Std. dev	N	t	df	Sig.
Use of Value Addition Initiatives	Kwara	65.56	18.228	160	0.154	218	0.878
	Kogi	65.15	15.207	60			

Significance tested at 0.05 level
Source: Analysis of Field Survey data

CONCLUSIONS

The study concludes that value addition initiatives use in fish farming was still very low in the constituent states of the study despite the fact that fish farming accounted for more than one-third of the respondents' total annual income and some of the severe constraints encountered accounted for the low level of use of value addition initiatives by the fish farmers. Five factors were found to significantly ($p< 0.05$) influence fish farmers' likelihood to use value addition initiatives. These were age, household size, educational level, fish farm income and years of fish farming experience of the farmers.

Based on these findings, the study therefore recommends an urgent need for the packaging of robust training programmes and advisory services for fish farmers by extension workers, government agencies, Non-Governmental Organisation and other stakeholders. For maximum impact, value addition initiative use interventions should be focused more on fish farmers who are in the middle age category, educated and thus highly innovative. These represent the characteristics of farmers that are more likely to use value addition initiatives. Also, Government should package stable, realistic and workable long-term policies in the aquaculture sector that will include ameliorating the high prices of inputs in the sector and enhance easier access to high quality fish seeds through the setting-up of established hatcheries in the major areas known for fish farming including the study areas. Finally, ADPs and Ministry of Agriculture in the constituent States should look into solving the problem of inadequate communication that exist between extension agencies and fish farmers as identified by the respondents in order to ensure that fish farmers benefit from proper advisory services and capacity building efforts that will enhance their use of value added initiatives thereby making them to be able to tap into all the available potentials that exist in the aquaculture sector.

Conflict of Interest

All the authors declared no conflict of interest.

REFERENCES

Adefalu, L.L., Aderinoye-Abdulwahab, S.A., Bello, O.G., Olorunfemi, O. D., and Oba, S. A. (2013). Information Needs of Fish Farmers in Ilorin Metropolis, Kwara State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment* 9(2): 1-5.

Adisa, B.O., Adeokun, A.O. and Oladoja M.A. (2006). The Effect of Socioeconomic factors on Perceived Adequacy of training received by women in agriculture in Ijebu and Remo Division of Ogun State, Nigeria. *Journal of Agriculture Extension* 9: 101-109.

Dunlap, A. (2006). Checklist for Starting Value-Added Agriculture Enterprise. The Value-Added and Alternative Agriculture Start-Up. NC State University, College of Agriculture and Life Sciences. 2pp. Available online: www.agmrc.org.

Egbufor, H.E., Onemolease, E.A. and Erie, A.P. (2012). Capacity Development Needs and Constraints of Fish Farmers in Edo South Agricultural Development Zone of Edo State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment* 8(4): 1-6.

Ezike, K. N. N., Nwibo, S. U., and Odoh, N. E. (2011). Cassava Production, Commercialization and Value Addition. In: Odedina, S. A., Osuntade, O. B., Adebayo, K., Awodun, M. O. and Fapohunda, O. O. (Eds). Proceeding of the Farm Management Association of Nigeria Conference Held at Federal College of Agriculture, Akure. Pp 173-179.

Falola, A., Banjoko, I.K., and Ukpebor, P.O. (2012). Willingness-to-Pay for agricultural Extension Services by Fish Farmers in Nigeria: A Case Study of Kwara State, Nigeria. *Journal of Susutainable Development in Africa* 14(5): 197-207.

Federal Department of Fisheries (2008). Fisheries Statistics of Nigeria, 4th Edition. Federal Department of Fisheries, Abuja. 41pp.

Food and Agriculture Organization of the United Nations (2011). The State of World Fisheries and Aquaculture, Rome.

Green facts (2004). "World Fisheries Production". www.greenfacts.org/fisheries/04-utilization.htm. Retrieved on 15th January, 2013.

ICLARM (2001). ICLARM Strategic Plan 2000-2020.The World Fish Centre, Malaysia. 27pp.

National Bureau of Statistics (2006). Core Welfare Indicator Questionnaire Survey, Nigeria, 2006 Abuja.

NPC (2006). 2006 Population and Housing Census of the Federal Republic of Nigeria. Priority Table (Volume 1). National Population Commission, Abuja, Nigeria.

Nwachukwu, I. and Onuegbu, R. (2007). Adoption of Aquaculture Technology by Fish Farmers in Imo State of Nigeria. *Journal of Technology Studies* 33(1): 57-64.

Nwankwo, B. (2005). Nigeria may ban fish import. The Guardian Newspaper.

Nwaru, J. C., Onuoha, R. E., Iheke, O. R. and Onyeachonam, E. O. (2010). "Analysis of loan Demand by Farmers in Oshimili North Local Government of Delta state, Nigeria." In: Nmadu, J. N., Ojo, M. A., Mohammed, U. S., Baba, K. M., Ibrahim, F. D. and Yisa, E. S. (eds) *Commercial Agriculture, Banking Reform and Economic Downturn: Setting a New Agenda for Agricultural Development in Nigeria.* Proceedings of 11th Annual National Conference of National Association of Agricultural Economists (NAAE). Pp 77 – 82.

Ogunlade, I. (2007). Backyard Fish Farmers Information Needs in Osun State, Nigeria. Proceedings of AAAE Ghana Conference, 2007: 165 – 169.

Okonji, V.A. and Bekerederemo, B. (2011). Fish Farm management Practices in Edo State: Implication on Current Fish Supply Situation. In: Erhabor, C. I., Ada-Okungbowa, C. O., Emokaro and Abiola, M. O. (eds) *From Farm to Table: Whither Nigeria.* Proceedings of 12th Annual Conference of National Association of Agricultural Economists (NAAE). Pp 599 – 604.

Olaoye, O. J. and Oloruntoba, A. (2011). Determinants of Aquaculture Technologies Adoption among Fish Farmers in Obafemi-Owode Local Government Area of Ogun State, Nigeria. *Journal of Humanities, Social Sciences and Creative Arts* 5(1): 37-48.

Olapade, A. O., Adeokun, O. A. (2005). Fisheries Extension Services in Ogun State. Africa *Journal of Livestock Extension* 3: 78-81.

Ridler, N.B. and Hishamunda, N. (2001). Promotion of Sustainable Commercial Aquaculture in Sub-Saharan Africa, vol. 1. Policy framework. FAO Fisheries Technical Paper, No. 408/1. FAO 2001. 16pp.