Research Article

Training Needs of Fish Farmers on Value Addition Initiatives in Kwara State, Nigeria

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Abstract | The research investigated the training needs of fish farmers' on value addition initiatives in Kwara State, North Central Nigeria. Data were collected using a two-stage sampling technique to select one hundred and sixty respondents for the study. A purposive selection of two Local Government Areas each from the two Agricultural Development Programme administrative zones (Zones C and D) in Kwara State where fish farming is prominent and well-practiced was carried out. Forty fish farmers were then randomly selected from the fish farmers' association chapter present in each selected Local Government Area. Interview-schedule was used to elicit information from the respondents. The findings revealed that the fish farmers were economically active with a mean age of 42.5 years, majority (73.1%) were males, married (74.4%) and had one level of formal education or the other (82.5%). Chi-square analysis revealed a significant relationship between the respondents' training needs on value addition initiatives and their age, educational level, years of experience and fish farm income. The value addition initiatives use profile of the fish farmers was still very low among the respondents and training was highly needed on value addition initiatives in seven major areas. It was recommended that robust training programmes and advisory services should be packaged by extension organizations and other stakeholders for fish farmers in the major areas of capacity deficiencies indicated so as to enhance their use of value addition initiatives from production to marketing.

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Introduction

Worldwide, fish production has grown dramatically in the last 50 years with fish food supply outpacing world population growth (FAO, 2014). The livelihoods of millions are dependent on fish farming and the fishery industry is crucial to the world economy (Nwachukwu and Onuegbu, 2007). In Africa, the fish sector provides income for over 10 million people engaged in fish production, processing and trade (NEPAD, 2005). It is estimated that Africa produced 7.3 million tonnes in 2003, and about 80% of this is produced by just two countries which are: Nigeria and Egypt (FAO, 2011).

Nigerians are high fish consumers and offer the largest market for fish and fishery product in Africa (Olaoye and Oloruntoba, 2011). The fisheries subsector occupies a unique position in the agricultural sector of the Nigerian economy as it contributes about one-tenth of the GDP of the sector (FDF, 2008). Its prospect continues to increase due to the huge gap between

fish demand and supply which leaves a shortfall of about 680,000 metric tons of fish annually necessitating government importation of fish worth N97 billion annually (Adekunle, 2013). This continuous increase in import bills for fish products is not a good omen for Nigeria's economy and thus creates opportunities for fish farmers to leverage on. However, despite the huge gap between demand and supply, Nigerian fish farmers seems not to be able to fully maximize the prospect in the sector due to the underdevelopment and use of value addition initiatives (Adefalu et al., 2013) as many fish farmers are still experiencing low profit margin or even inability to break even. Fish farmers are now experiencing pressures that come not only from lower selling prices, but also from higher input cost (EU, 2011). Akegbejo-Samsons and Adeoye (2012) revealed that only 25% of the 40 fish farms sampled in South West Nigeria operated their fish farming enterprise profitably while the remaining 75% were not. 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 in fish farming refers to the use of production methods, innovation and handling processes intended to improve the farmer's processes and products in order to lead to an enhancement in the customer base for the product and a greater proportion of income accruing to the fish farmer. It goes further to involve the enhancement in the processing, packaging and marketing of the product (Walia, 2007). Value addition improves the natural and conventional form, quality and appeal of a product subsequently increasing the consumer valuation beginning from the farm level to marketing of finished products (Mwinyihija, 2010). Value addition initiatives have a particular importance in that it offers a strategy for transforming an unprofitable enterprise into a profitable one. Thus processes connected with value addition initiatives appear to be one of the keys available to unlocking and improving the economic situation of this sector.

Adefalu et al. (2013) reported that a very low percentage of fish farmers were involved in processing and preserving their fish produce in studies carried out in areas within North Central Nigeria which is a very important initiative in value addition. This might serve as a key pointer to why a lot of income potentials embedded in the fish and aquaculture sector is lost. Since use of value addition initiatives are the drivers of profit maximization in the aquaculture sector, an efficient extension service should be the pillar of these efforts (Adekunle, 2013). Therefore, there is the need to research on the areas of knowledge deficiencies and training needs of the fish farmers in Kwara State, North Central Nigeria as it relates to value addition initiatives in fish farming in order to shed light on the areas of capacity building and advisory services that should be intensified by extension agencies on value addition initiatives in its various forms. To this end, the study specifically sought to describe the socio-economic characteristics of the fish farmers in Kwara State; identify the information sources preferred by the respondents in fish farming; determine the value added initiatives use profile of the fish farmers; identify the areas of training needed by the fish farmers on value addition initiatives.

Materials and Methods

The study was conducted in Kwara State. The state is 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°C – 37°C in the year and rainfall of 1000 to 1500 mm annually.

The study population comprises the fish farmers in Zones C and D agro-ecological zones of Kwara State. This is the zone where fish farming is prominent in the State. Collection of data was carried out using a structured questionnaire. A two-stage sampling technique was employed in the selection of the respondents. A purposive selection of two (2) LGA each from the two ADP administrative zones (Zones C and D) in Kwara State where fish farming is prominent and well-practiced was carried out based on the information obtained from the State' ADP and Ministry of Agriculture. Forty (40) fish farmers which 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 one hundred and sixty (160) fish farmers.

Data were collected on the socio-economic character-

istics of the fish farmers, their preferred information source on fish farming, their value addition initiative use profile while the dependent variable was the fish farmers' training needs on value addition initiatives. These variables were measured as follows:

Training needs on value addition initiatives

a) Previous Training Received: Respondents were asked whether they have received any previous training on fish farming rated No (1) and Yes (2)
b) Respondents were presented with a list of areas of training they may need on value addition initiatives and they were asked to rate these items on a 3-point likert type scale of highly needed (3), moderately needed (2) and not needed (1).

Value addition initiative use profile of the fish farmers

Analysis of the Value addition initiatives utilization 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.

Information sources preferred

Respondents were asked to indicate their preference of some information sources on a 3-point likert type scale of Most preferred (3), Preferred (2), Not Preferred (1).

Data analysis

Data analysis was carried out using descriptive statistics such as frequency counts, percentages, mean scores, and ranks while Chi-square analysis was used as an inferential statistics to test the proposed hypothesis in the study.

Results and Discussion

Socio-economic characteristics of the fish farmers

Table 1 revealed that the average age of the fish farmers was 42.5 years. Fish farmers in the area are therefore generally in their economically active years hence giving them the privilege to leverage on this attribute for a high degree of prospects and viability in value added production. This result is corroborated by Egbufor et al. (2012) who reported that able bodied young men were the ones largely and actively involved in fish farming. This might be as a result of the fact that fish farming needs a high sense of vigour and energy which might be difficult for the aged to cope with. These are all in line with 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 et al. 2006).

The results showed that there were more males (81.7%) involved in fish farming than females (18.3%). As pointed out by Okonji and Bekerederemo (2011), this is due to the tedious nature of some aspect of fish farming such as culturing which a lot of females may not be able to cope with. This agrees with Falola et al. (2012) who reported that males were mostly involved in fish farming than females.

Furthermore, Table 1 showed that majority (88.3%) of the fish farmers are married thus implying that majority 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 mean household size of the respondents was 6 persons further confirming 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 a close neighbouring state to the study area were also married with dependents.

Table 1: *Socio-economic characteristics of the fish farmers*

Socio-economic Characteristics	Frequency	Percentage (%)	Mean
Age (Years)			
≤ 30	17	10.6	42.5years
31 – 40	67	41.9	
41 – 50	37	23.1	
51 – 60	31	19.4	
> 60	8	5.0	
Gender			
Male	117	83.1	
Female	43	26.9	
Marital Status			
Single	30	18.8	
Married	119	74.4	
Widowed	6	3.8	
Seperated	5	3.1	
Household Size (Persons)			
1 – 4	46	28.8	6persons
5 – 8	96	60.0	
9 – 12	18	11.3	
Educational Level			
No formal Education	28	17.5	
Primary Education	42	26.3	
Secondary Education	46	28.7	
Tertiary Education	44	27.5	
Fish Farming Experience (Years)			
≤ 4	65	40.6	
5 – 9	61	38.1	6.3years
10 – 14	29	18.1	
> 14	5	3.1	

Source: *Field Survey, 2014;* **N**: *160*

Table 1 further revealed that majority (85.0%) of the respondents were literate thus suggesting that fish farming is dominated by literate persons. This high level of literacy among the respondents is expected to enhance innovativeness and success among them. Riddler and Hishamunda (2001) reporting a similar result 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. The result is in consonance with Adefalu et al. (2013) and Ogunlade (2007) where they stated that most of the fish farmers in Kwara and Osun State, Nigeria, respectively, were formally educate.

Majority (85.0%) of the fish farmers had 5 years and above fish farming experience. On the average, the fish farmers have been into fish farming for about 6 years implying that most of them 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 agreed that new entrants into the aquaculture sector are at a higher risk compared to experienced fish farmers.

Table 2: *Sources of information preference of the fish farmers*

Information sources	Most preferred	Preferred	Not preferred	Mean score	Rank
Fish Farm Association	136 (85.0)	24 (15.0)	0 (0.0)	2.85	1st
Television	18 (11.3)	86 (53.7)	56 (35.0)	1.76	5th
Radio	75 (46.9)	60 (37.5)	25 (15.6)	2.31	4th
Print Media	9 (5.6)	73 (45.6)	78 (48.8)	1.57	7th
Extension Agent	59 (36.9)	94 (58.7)	7 (4.4)	2.33	3rd
Neighbours and Friends	128 (80.0)	28 (17.5)	4 (2.5)	2.78	2nd
Personal Consultants	12 (7.5)	51 (31.9)	97 (60.6)	1.46	8th
Cooperative Societies	16 (10.0)	75 (46.9)	69 (43.1)	1.67	6th
Computer/ Internet	12 (7.5)	32 (20.0)	116 (72.5)	1.35	9th

Mean Score derived from MP: *3;* **P:** *2,* **NP:** *1;* **N:** *160;* **Source:** *Field Survey, 2014;* **Note:** *The values in parenthesis represent the percentage while the value outside represent the frequency*

Information sources preferred by the respondents

Table 2 revealed the sources of information preference of the fish farmers. Out of the 9 sources of information presented to the respondents, four of these sources were prominently preferred. Using mean scores to rank the information sources according to their order of preference as indicated by the fish farmers, Fish farmers association ranked 1st with MS

= 2.85, Neighbours and friends was 2nd with MS = 2.78, Extension agent was third with MS = 2.35 and Radio was ranked 4th with MS = 2.32. This conforms to the report of Falola et al. (2012) who reported a similar trend. The remaining sources of information which includes Television, Cooperative Societies, Print media, Personal Consultants and Computer/Internet with mean score 1.78, 1.66, 1.54, 1.46 and 1.27, respectively, were less preferred. This shows that these four information sources were accessible and effective sources that the farmers would prefer to be used in disseminating and diffusing innovations and value added technologies in this area. The implication of this is that government and all other stakeholders in the aquaculture sector should focus more attention on the usage of these four sources of information when making efforts in capacity building and extension of information among the fish farmers in the study area.

Value addition initiatives use profile of the respondents

Results in Table 3 showed that more than two-third (70.6%) of the respondents had a low value addition initiative use score in fish farming while just a few (29.4%) of the respondents had a high value addition initiative use score. On the average, the value addition initiative use score for the fish farmers in the study area was 65.5 (score ranges from 40 minimum – 120 maximum) signifying a low use of value addition initiative among the respondents. This result is in consonance with the findings of Nwachukwu and Onuegbu (2007) who reported a low use of fish technologies by fish farmers generally in Nigeria. The implication of this is that most of the fish farmers 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. Brewin et al. (2009) found out that farmers that utilize both product and process value added innovation generate more income and are better able to compete favourably in the market and keep pace with competitors. This may be a pointer to why the fish farmers in the study area are experiencing stagnation in their income.

Fish farmers training needs on value addition initiatives

According to Figure 1, more than two-third (70.0%) of the fish farmers indicated that they had not participated in any form of fish farming training while less than one-third (30.0%) indicated they have received

Table 3: *Distribution of Respondents according to their Total Value Added Initiative Use Level in Fish Farming Production*

Value Added (VA) Initiative Use Level	Frequency	Percentage (%)
Low VA Initiative Use (40 – 79)	113	70.6
High VA Initiative Use (80 – 120)	47	29.4
Total	160	100.0

Source: *Field Survey, 2014.*

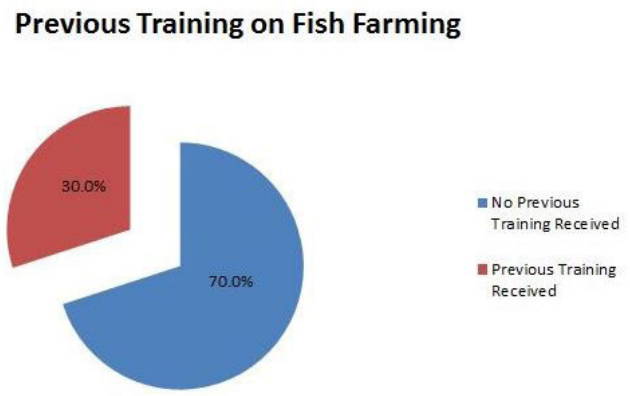

Figure 1: *Distribution of respondents' according to their previous participation in fish farming training*
Source: *Field survey, 2014*

one form of training or the other as it relates to fish farming. This goes further to reveal that not much has been done by extension services in extending training as it relates to the use of value addition initiatives to the fish farmers. This implies that majority of the respondents are not equipped properly with the requisite knowledge needed in fish farming before venturing into the enterprise and so they usually will have to learn a lot of things by their personal experience in the business. Meenambigai and Seetharaman (2003) asserted that training is the most singular factor that affects individuals, attitude, productivity, improvement, minimization of risks and quality of job performance in any endeavour. This might be a pointer to why majority of the respondents do not have a high value addition initiative use score. Their use of value added initiatives might be limited to only those initiatives they are able to personally conceive from their experience over the years and if they have a somewhat good information seeking behaviour, they also might be able to use more value added initiatives based on those initiatives they are able to gather from the experience of neighbour and friends around them. This should therefore gear up extension services to rise to the challenge of being the pillar in disseminating value

added initiatives, innovation, and technologies to the fish farmers for better profit maximization.

Table 4: *Fish farmers training needs on value addition initiatives*

Training Needs	Mean Score	Rank
Various products & by-products obtainable from fish farming	2.14	13th
Standardization of products for both domestic and export markets	1.89	17th
Safety and Quality of products under hygienic conditions	2.46	7th
Proper water monitoring and management	2.33	10th
Proper record keeping	2.57	6th
Post-harvest handling of Fish products	2.67	3rd
Personal entrepreneurial skills and initiatives	2.20	11th
Maximizing Marketing Techniques & Channels in your area	2.16	12th
Improved processing techniques and initiatives	2.74	1st
Improved packaging and labelling initiatives	2.65	5th
Improved Fish farm design, construction & Management practices	2.74	1st
How to diversify your markets	2.11	14th
Group cooperation, dynamics and networking	1.90	16th
Fish seed production & Hatchery management	2.66	4th
Feed ration formulation, nutrition and feeding	2.43	9th
Disease diagnosis, prevention and control	2.45	8th
Access and use of some improved fish farming tools and technologies	1.97	15th

Mean Score derived from HN: 3; MN: 2; NN: 1; N: 160; **Source***: Field Survey, 2014*

Table 4 revealed that training was highly needed on "Improved fish farm design, construction and management practices" (MS = 2.74), "Improved processing techniques and initiatives" (MS = 2.74), Post-harvest handling of fish products" (MS = 2.67), "Fish seed production and hatchery management" (MS = 2.66), "Improved packaging and labelling initiatives" (MS = 2.65), "Proper record keeping" (MS = 2.57) and "Safety and quality of products under hygienic conditions" (MS = 2.46) as they ranked 1st, 3rd, 4th, 5th, 6th and 7th, respectively. The Table 4 further showed that training was moderately needed in the other areas of fish farming value addition initiatives. This implies that the respondents urgently need to have their competence in the use of value addition initiative in fish farming enhanced in the areas where training is highly needed. Okwu and Ejembi (2005) stated that training helps farmers acquire necessary skills to upgrade their production practices with positive implication on the efficiency of their production. Therefore, extension agencies, government and other stakeholders in the aquaculture sector should focus more attention on educating and enlightening the fish farmers on these areas in order to enhance their utilization of value addition initiatives which will thus translate into better income and improved livelihood for the fish farmers.

Relationship between selected socio-economic characteristics of respondents and their training needs on value addition initiatives

Table 5 revealed that there is a significant relationship between the fish farmers capacity building needs on value addition initiatives and their age (X^2 = 6.244), educational level (X^2 = 2.621), fish farm income (X^2 = 8.636) and years of fish farming experience (X^2 = 4.214), thus the null hypothesis was rejected. Furthermore, the table showed that there is no significant relationship between the fish farmers' training needs on value addition initiatives and their gender, household size and marital status thus the null hypothesis was accepted. This implies that the fish farmers training needs on value addition initiatives is most likely to be influenced by their age, educational level, years of fish farming experience and fish farm income while fish farmers' gender, marital status and household size may not have any significant influence on their training needs on value addition initiatives in fish farming.

Table 5: *Relationship between selected socio-economic characteristics of respondents and their training needs on value addition initiatives*

Variables	df	X^2	Significance	Decision
Age	4	6.244	0.011	Reject Ho
Gender	1	1.951	0.684	Accept Ho
Household Size	3	4.323	0.525	Accept Ho
Educational Level	3	2.621	0.005	Reject Ho
Fish Farming Experience	3	4.214	0.021	Reject Ho
Fish Farm Income	3	8.636	0.042	Reject Ho
Marital Status	3	1.273	0.316	Accept Ho

Source*: Field Survey, 2014;* **Significant level***: 0.05*

Conclusions

The study concludes that value addition initiative use

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in fish farming was still very low in the study area and the high number of farmers with no training in fish farming coupled with their indication of high need for training in major value addition areas accounted for the low level of use of value addition initiatives by the fish farmers. Based on these findings, the study therefore recommends the packaging of robust training programmes and advisory services by extension organizations and other stakeholders for fish farmers in the major areas of capacity deficiencies indicated in order to enhance their utilization of value added initiative from production to marketing. This will increase the level of income accrued to them thus making the enterprise more profitable.

Author's Contribution

Olorunfemi O.D. designed and conducted the research; Adekunle O.A. supervised the research; Oladipo F.O. and Oladele T.O. contributed during the design of the interview schedule and data collection phase of the study. Oladele O.I. evaluated and edited the manuscript.

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