ASSESSMENT OF INFORMATION SOURCES IN POTENTIALS AND SKILLS OF FISH FARMERS PRODUCTION TECHNOLOGIES IN DELTA CENTRAL AGRICULTURAL ZONE OF DELTA STATE

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ABSTRACT
The study was carried out to assess information sources in potentials and skills of fish farmers' production technologies in Delta Central Agricultural Zone of Delta State. The specific objectives of the study include to: examine the socio-economic characteristics of fish farmers in Delta Central Agricultural Zone of Delta State, identify various sources of information mostly adopted and used by respondents in the area of study, assess respondents attitude towards spawning technologies in the state, and identify the perceived benefits derived by the fish farmers from available spawning technologies. Data were obtained from the farmers through the use of 105 structured questionnaire and interview schedule. Descriptive statistics was used to analyze the objectives of the study while inferential statistics (Logistics regression) was used to analyze the hypothesis of the study. Findings of the study showed that most (82.86%) of the respondents were males and married (60%). The respondents mean age, educational qualification and household size were 45.19 years, 15.54 years and 5 persons respectively. Farm size, farm experience and years of residence in community were respectively 3176, 11.43 years and 15.86 years. The Average farm income was N328,095.24. The farmers showed that they benefited in the area of increased knowledge, enhanced standard of living and farm output/productivity. Socioeconomic characteristics like household size (b = 2.153), farm income (b = 1. 414), educational status (b = 1.241) age (b = 0.728), marital status (b = 0.437), years of residence in community (b = 0.408) and farm size (b = 0.346) were significant variables to respondents perception and usefulness of spawning technologies. The study thus recommends that print media should be used by government agricultural agencies to disseminate agricultural information to farmers and that group meetings should be seen as a place where agricultural information can also be disseminated.Key words: Information, skills, fish, farmers, income, spawning, technologies.

INTRODUCTION

In Nigeria, the role of fish farming in meeting the protein need of the people cannot be over emphasized. The practice involves an artificial means of raising fishes in ponds, tanks or any suitable enclosures. It actually provides profitable means of livelihood for both rural and urban dwellers (Esobhawan and Ogundele, 2011). Fish is very nutritious, providing a good source of high quality protein and other essential nutrients, which are essentially important for mothers and growing children, it is low in calories and cholesterol levels but rich in protein (FAO, 2005). Due to the importance aforementioned, almost all natural fish stocks in the country, Nigeria, have been over exploited yet the production level has not been able to meet up with the demand for fish (Salau, *et al.*, 2014). The authors noted that the demand has not only been blamed on the steady increase in the nation's population but also very much on the dearth of information sources on improved fish farming and spawning technologies. To this end in view, the role of information in enhancing agricultural productivity development cannot be over emphasized hence it is said to be vital for increasing production and improving marketing and distribution strategies (Oladele, 2006).

On a general note, information is that which is capable of causing a human mind to change his/her opinion about the current state of the real world (De Watteville and Gilbert, 2000). In particular, agricultural information is that which brings about interactions with and influences agricultural productivity in a variety of ways (Demiryurek*et al.*, 2008). As posited by Aina *et al.*, (2005), agricultural information open windows for sharing experiences, best practices, sources of financial aids and new markets.

Meanwhile, the sources of agricultural information was pointed out by Daudu*et al.*, (2009) to include extension agents, contact farmers, family members, neighbors, friends, libraries and the media like radio and television. The fish production technologies information that could be sought on include; pond construction and management, breed selection, stocking, feeding, water management, sorting, harvesting, processing, storage, marketing, spawning and record keeping (Ofuoku*et al.*, 2008). From personal communication, it was gathered from the respondents of the study that spawning is carried out in a process or in the order of getting spawners read, collection of pituitaries or hormones, injection of female spawners, collection of milt (sperm of male), stripping of female spawners, fertilization of eggs and lastly, incubation of eggs.

Aderet*et al.*, (2006) stressed that for the information to have its quality and convey its meaning, it should be free from bias, get to the farmers at the right time of need and it should answer the users questions of what, why, when, who and how. Unfortunately, this

is not the case as the information available to the fish farmers has not been quality enough to make it possible for fishes produced to meet demand. The lag calls for ideal and quality information that would help the farmers improve in their fish farming and fish farming technologies especially spawning technologies and other information needed for improved production levels. Against this background, the study seeks to assess information sources in potentials and skills of fish farmers' production technologies in Delta Central Agricultural Zone of Delta State. Specifically, the study hopes to;

i. Examine the socio-economic characteristics of fish farmers in Delta Central Agricultural Zone of Delta State.
ii. Identify various sources of information mostly adopted and used by respondents in the area of study.
iii. Assess respondents attitude towards spawning technologies in the state, and
iv. Identify the perceived benefits derived by the fish farmers from available spawning technologies.

Hypothesis of the Study

H_{o1}: There is no significant relationship between respondents' socio-economic characteristics and their perception of the usefulness of spawning technologies in Delta State.

METHODOLOGY

Study Area

The study was carried out in Delta State.Geographically, the State is accommodated between longitudes 5.00^0 and 6.45^0 North and latitudes 18^0 and 23^0 South. It is flanked by Edo State to the North, Ondo State to the North-West, Anambra State to the East and it is bounded in the South by the Bight of Benin and has an Atlantic Coastline of 160km (AWC, 2006). It is an oil rich, agricultural producing and one of the six states in the south-south geopolitical zone of Nigeria. It was created from the defunct Bendel State on 27th August 1991. Delta State has 25 Local Government Areas with its capital at Asaba. Its population size is 4,170,214 (based on 2006 census figure) and it occupies a land area of 17,698 Km^2 (AWC, 2006). The state has a diverse ethnic and tribal group mostly made up of the Isoko, Ika, Urhobo, Itsekiri,Izon, Ukwani and Aniocha speaking people. The predominant occupation of the people is farming, oil prospecting, civil service, trading and commerce (AWC, 2006). The report stated that Delta State is divided into three agricultural zones, namely: Delta North, Delta Central and Delta South and they respectively have 9, 10 and 6 LGAs. The state is marked by two distinct seasons, they are the dry and rainy and this makes it possible for a variety of crops (like rubber, cassava, yam, plantain, maize oil palm, etc) to be grown in the state.

Sampling

The study was limited in scope to sources of information on fish production technologies and the skills of fish farmers in Delta Central Agricultural zone of Delta State.

Multiple stage sampling technique was used for the study. The first stage involved the purposive selection of four (4) Local Government Areas (LGAs) from Delta Central Agricultural zone of the state. The LGAs are Sapele, Udu, Ughelli North and Ughelli South. The reason for their purposive selection was strictly based on the intensity of fish produced in the area. The second stage involved the selection of three (3) towns from each of the LGAs thus making the number of towns to be twelve (12) (Sapele town, Amukpe and Songhai were selected from Sapele LGA; Ekete, Otor-Udu and Asagba from Udu LGA; Ughelli, Agbaro and Agbarah from Ughelli North; while Utor-Jeremi, Ekakpamre and Okpare were selected from Ughelli South). The third stage involved the purposive selection of ten (10) fish farmers domiciled in the selected towns. Efforts were made to ensure that the selected fish farmers have experience, implying that they must have been in the business for more than three years and such was got from the list of registered fish farmers in Delta Agricultural Development (ADP).

This gave a total of one hundred and twenty (120) farmers. These farmers were administered with the question instrument and out of all returned instruments one hundred and five (105) (87.50%) of them suitable for analysis was used for the study.

Primary and secondary data were used for the study. Primary data were sourced through the use of questionnaires (for the literate farmers) and interview schedules (for non-literate farmers). The question instruments were screened for validity through the face-content method by experts in the field of Agricultural Extension. The instruments reliability was achieved through the use of Alpha Crombash method which produced a coefficient of 0.73, indicating a high level of reliability. The instruments were administered and retrieved by the researcher duly assisted by the enumerators and some staff of Delta Agricultural Development Programme (DADP).

Data were analyzed using descriptive (frequency, percentage mean and standard deviation) and inferential statistics. Farmers socio-economic characteristics was analyzed using frequency, percentage and mean, while respondents sources of information, their attitude and perception of spawning technologies and the derived perceived benefits from available spawning technologies were analyzed using a four-point Likerttype scale, scored as follows Strongly Agree (coded 4), Agree (coded 3), Disagree (coded 3) and Strongly Disagree (coded 1). It produced a weighted mean score of 2.50 (obtained as 4+3+2+1 = 10/4 = 2.50). Mean values of 2.50 and above indicated that the respondents agreed or preferred the sources of information on spawning

technologies, agreed to the respondents attitude and perception and agreed to the perceived benefits perceived derived from the available spawning technologies.

Furthermore, the hypothesis of the study was analyzed using Logistic regression. The variables in the model were specified as;

Y = Perception of the usefulness of spawning technologies (very useful = 1, useful =0)
X_1 = Gender (dummy: male = 1; female = 0)
X_2 = Age (years)
X_3 = Education (years)
X_4 = Marital status (single = 1, married = 2, divorced = 3, widow(er) = 4)
X_5 = farming experience (years)
X_6 = Farm size (number of fishes in ponds)
X_7 = Household size (number of people living and feeding together)
X_8 = farm income (₦)
X_9 = Years of residence in community (years)

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

The socioeconomic characteristics of the respondents is shown in Table 1. Results showed that most (82.86%) of the fish farmers were males while few (17.14%) were females. The large difference between the number of males and that of the females is a proven fact that the business is gender biased and this may not be unconnected to the tedious nature of the farming activities and its capital intensiveness.Confirming this thought, some of the female farmers (through personal communication) disclosed that they didn't enter into the business on their own thought, but that they inherited their fish farms from their late husbands. Odebode and Arimi (2011) supported the dominance of males in the fish farming business.The average age of the respondents was 45.19 years and majority (40.95%) of them belonged to this category (50 – 59 years). The result indicated that the respondents were a little elderly and this could be attributed to the financial demand of the business which can mostly be met by the elderly. This result is in line with that of Okwuokenye and Oriakhi (2014) which stated that fish farmers are usually a little elderly people,

The results showed that majority (60%) of the farmers were married. Others were single, divorced and widow(er) in the proportion of 7.62%, 13.33% and 19.05% respectively. The dominance of married people most likely with children in the business is an indication that it is a source of their livelihood. This result is in consonance with the findings of Akinbili*et al.,* (2008). They acknowledgedthat most married farmers depend on their farm products to improve on their economic livelihood. The mean of the educational level of the farmers was 15.54 years and majority (45.71%) belonged to this category. The result implies that they were in their secondary educational level. About 33.33% were below secondary school level while about 21% had schooled beyond secondary school level. The result implies that the respondents were literate and so can understand and apply fish production technologies. Agreeing with this result, Ewuola and Ajibefun (2000) stated that possession of formal education helps to enhance farmer's capacity to understand and work with new ideas that could boost productivity.

Most (45.71%) of the respondents household size was between 6 – 8 persons and the mean was about 5 persons. About 44.77% and 9.52% of the farmers had household size of less than 6 persons and more than 8 persons respectively. The result implies that majority of them (going by the African context) had small household size. Having small household size will help to improve the economic welfare of the household when the proportion of the dependents is respectively low. Results of Mohammad *et al.,* (2011) agreed with this finding as they advanced similar household size of farmers from their study on Fadama III project. The farm size of the respondents was measured on the number of fishes in stock. The mean farm size was about 3176 fishes. Majority (27.62%) of the respondents belonged to the average class. About 40.95% and 31.43% respectively had a farm size of less than 3001 and more than 4000 fishes. The result implies that the farmers are commercial farmers.

Results on farming experience of the respondents revealed an average of 11.43 years. About 36.19% of the farmers had less than 10 years farming experience while about 26.67% of them had more than 14 years farming experience. The implication of the result is that most of the farmers are experienced in fish farming business and this puts them in the position to know what they need as far as the business is concerned. Similar farm experience was reported by OKwuokenye and Oriakhi (2014). They reported the average farm experience of farmers to be 10.24 years. Years of residence of farmers in their community was found to have a mean value of 15.86 years. Majority (29.52%) of the farmers had stayed in their community for 15 – 19 years. The indication is that they have been living in the communities for a long period of time. Such a period of time can go a long way in imposing much confidence on the farmers and allowing them know where to go get the necessary information needed to improve their farms.

Table 1: Socio-economic characteristics of respondents of the study. (N= 105)

Socio-economic variables	Categories	Freq.	Percentage	Mean
Gender	Male	87	82.86	
	Female	18	17.14	
Age	< 30	7	6.67	
	30 – 39	17	16.19	
	40 – 49	22	20.95	
	50 – 59	43	40.95	
	≥ 60	16	15.24	45.19
Marital status	Single	8	7.62	
	Married	63	60.00	
	Divorced	14	13.33	
	Widow(er)	20	19.05	
Educational qualification (yrs)	No Formal edu.	6	5.71	
	Primary edu.	29	27.62	
	Secondary edu.	48	45.71	
	Tertiary edu	22	20.95	15.54
Household size	< 3	15	14.29	
	3 – 5	32	30.48	
	6 – 8	48	45.71	
	9 – 11	10	9.52	5.30
Farm size (No. of fishes)	< 1000	10	9.52	
	1000 – 2000	16	15.24	
	2001 – 3000	17	16.19	
	3001 – 4000	29	27.62	
	4001 – 5000	21	20.00	
	➢ 5000	12	11.43	3176.19
Farm experience (yrs)	< 5	13	12.38	
	5 – 9	25	23.81	
	10 – 14	39	37.14	
	15 – 19	17	16.19	
	20 & above	11	10.48	11.43
Years of residence in community (yrs)	< 5	5	4.76	
	5 – 9	9	8.57	
	10 – 14	26	24.76	
	15 – 19	31	29.52	
	20 & above	34	32.38	15.86

Source: Field survey:, 2018

Farm income range of respondents

The farm income range of the farmers is shown in Table 2. The results revealed that the average farm income of the respondents was ₦328,095.24 and this is the category (₦300,000 – ₦399,000) majority (29.52%) of the farmers belonged.From the result, it was revealed that 36.19% and 34.29% of the respondents respectively earned below ₦300,000 and above ₦399,000. The result indicated that the farmers are averagely doing well in their fish farming business. The result of Esobhawan and Ogundele (2011) confirmed the economic profitability of fish farming business.

Table 2: Farm income range of respondents

Farm income range (₦ '000)	Freq.	Percentage	Mean
<100,000	9	8.57	
100,000 – 199,000	14	13.33	
200,000 – 299,000	15	14.29	
300,000 – 399,000	31	29.52	
400,000 - 499,000	25	23.81	
≥ 500,000	11	10.48	328,095.24

Source: Field survey: 2018

Respondents' sources of information on spawning technologies

Analysis of the respondents sources of information on spawning technologies were displayed in their means and standard deviations and also ranked according to the level of how regular the sources are (see Table 3). Findings revealed that television (mean = 3.08) was the most regular source of information on spawning technologies. This source was followed by radio (mean = 2.95) and workshop/seminars (mean = 2.81). Other regular sources include phone calls (mean = 2.61), demonstrations (mean = 2.55) and farmers cooperatives (mean = 2.53).

From personal communication, the farmers acknowledged that television and radio were good and regular sources of information because of the wide spread of its coverage and the number of farmers that could be reached at a particular time. Workshops/seminars and demonstrations were also regular information sources. The farmers classed these later sources as good sources due to the level of practicability displayed in the process of training.Phone call was also expressed as a regular source and this was unconnected to the number of farmers that could be reached within specific time limit and the distance it could go. Also identified as a regular source of information to spawning technologies was farmers cooperatives. The farmers noted that they are able to brainstorm and reach a reasonable technology which they adopt in their fish farms.

Table 3: Respondents sources of information on spawning technologies

Information sources	Mean	Standard Dev.	Ranking
Television	3.08*	0.88	1
Radio	2.95*	0.83	2
Relation /neighbour	2.23	0.64	7
Farmers cooperatives	2.53*	0.63	6
Phone calls	2.61*	0.75	4
Group meetings or discussions	1.94	0.41	9
Demonstrations	2.55*	0.68	5
Workshops/seminar training	2.81*	0.71	3
Newspaper (print media)	2.14	0.61	8

Regular source of information (mean ≥ 2.50)
Source: Field survey, 2018

Respondents' attitude towards spawning technologies

The respondents' attitude towards spawning technologies is shown in Table 4 below. The results revealed that the farmers agreed with five out of the twelve technologies analyzed in the study. They include farmers need to select spawners before spawning (mean = 3.58), the need to be sure and particular of the hormone to use for spawning (mean = 3.14) and they need to weigh the fishes before spawning (mean = 2.77). Other attitudes agreed by the farmers are that farmers need to wash their hands before carrying out spawning (mean = 2.65) and that farmers can spawn at any time of the year.

Through personal communication, the farmers advanced that there is need to select the spawners and also weigh them before spawning. Doing this would help assure them of the fishes maturity which perhaps guarantees productivity. Again being sure of the hormone to use would help to ensure the productivity of the fishes at peak level. The farmers also acknowledged the need to wash hands before spawning. This would help guide against contamination which may disrupt the process. Finally, they (fish farmers) stated that spawning is more preferably carried out at cool hours of the day and at cool seasons.

Table 4: Respondents' attitude towards spawning technologies

Spawning technologies	Mean	Standard Dev.
Farmers don't need to select spawners before spawning	1.94	0.83
Farmers need to select spawners before spawning	3.58*	0.41
Farmers can spawn at any time of the year	2.53*	0.62
Farmers can carry out spawning at anywhere of his/her choice	2.01	0.80
Farmers can spawn at any time of the day	2.41	0.72
Farmers need not weigh the fish before spawning	2.31	0.67
Farmers need to weigh the fish before spawning	2.77*	0.61
Farmers need not wash their hands before spawning	2.37	0.49
Farmers need to wash their hands before spawning	2.65*	0.51
Farmers need not be sure and particular of the hormones to use for spawning	2.11	0.49
Farmers need to be sure and particular of the hormones to use for spawning	3.14*	0.48

**Agreed with attitude (mean ≥ 2.50)*
Source: Field survey, 2018

Respondents perceived benefits from spawning technologies

Table 5 shows the perceived benefits derived by the fish farmers from use of available spawning technologies, which underscores their reasons for the use of spawning technologies. The table shows that there are various benefits the fish farmers derived from the use of available spawning technologies. Although, the benefits ranked or rated differently amongst the farmers. However, amongst these benefits, enhancement of fish output/productivity (mean = 3.47) was agreed as the most perceived benefit. This was followed by the farmers perception of improvement of their standard of living (mean = 3.44), increased knowledge of fish farming practices (mean = 3.42) and availability of fry and fingerlings all-round the year (mean = 3.31).

Other perceived benefits the respondents seemed to have derived from spawning technologies were provision of better rates of fertilization and hatching (mean = 3.21), the possibility of having hybrid fishes from the use of spawnners (mean = 2.98), providing the fishes with better conditions of growth and survival (mean = 2.64) and that it has facilitated their linkage to fish input providers (mean 2.59).

Enhancement of farm output/income and improvement in the farmers standard of living were attested to by the report of Esobhawan and Ogundele (2011) where they stated that artisanal fishery sector holds the key to the country's (Nigeria) domestic fish production and it is likely to make the country self-sufficient in fish production. The facilitation of linkage to fish farm input providers and the availability of frys and fingerlings allthe year round were agreed by Peace (2015). The author stressed that fish spawning technologies joined in the provision of constant supply of stocking materials all year round.

The benefit of advancing better rates of fertilization and hatching was acknowledged by Roy (2018) whose report stated that those fishes that don't lay eggs in stagnant water/stream only get along through artificial breeding that takes advantage of improved spawning technologies. Again, the same report of Roy (2018) agreed with the farmers' perceived benefit of having spawning technologies resulting to provision of better conditions of growth and survival as it stated that spawning technologies brings about producing high quality minnow species and production of good size and weight of fishes. Perceived benefit that has to do with the possibility of having hybrid fishes from the use of different spawnners was as well agreed by Roy's (2018) report where he stated that it is possible to produce hybrid fishes by mixing different species of fishes.

Table 5: Respondents perceived benefits from spawning technologies

Perceived benefits	Mean	Standard Dev.	Ranking
Increased knowledge of fish farming practices	3.42*	0.53	3
Improved farm income	3.38*	0.57	4
Enhance farm output/productivity	3.47*	0.63	1
Improved standard of living	3.44*	0.53	2
Facilitated linkage to fish farm input providers	2.59*	0.78	9
Better rates of fish fertilization and hatching	3.21*	0.55	6
Better rates of growth and survival	2.64*	0.92	8
Availability of fry and fingerlings all-round the year	3.31*	0.46	5
Possibility of having hybrids fishes from use of different spawners	2.98*	0.68	7

**Agreed (Mean ≥ 2.50)*
Source: Field survey, 2018

Relationship between socio-economic characteristics of respondents' and their perception of the usefulness of spawning technologies.

Table 6 shows Logistic regression result analysis for the relationship between respondents' socio-economic characteristics and their perception of the usefulness of spawning technologies.The model Chi-square value (X^2 = 51.88; df = 9) was significant at the 1% level (Critical X^2 = 2.733). This simply means that the model is significant and appropriate for the test.

The coefficient of determination (adjusted R^2)was 0.617. This implies that the explanatory variables accounted for or explained 61.7% variation in the dependent variable i.e. farmers perception of the usefulness of spawning technologies. From result on the Table, seven out of nine explanatory variables have a significant influence on farmer's perception on the usefulness of spawning technologies in the study area. The variables are arranged in the order beta coefficient and they are discussed below:

Household size exacts the strongest influence on farmers perception on the usefulness of spawning technologies (b = 2.153; t = 4.826). The result was positively signed implying that larger households have greater perception of the usefulness of spawning technologies. The odd ratio was 2.413 and the implication is that farmers with larger households are two times likely to have a higher perception for the usefulness of spawning technologies. Higher perception for the usefulness of spawning technologies could be linked to having provided more yield and income in order to sustain their

livelihood. The result is supported by the assertion of Nagujja (2003). He asserted that higher perception for farm technologies would result to higher productivity which would be needed to cater for his/her household.

Farm income of the respondents was another factor that influenced farmer's perception. Its beta coefficient was 1.414, it was positively signed and its implication is that farmers with higher farm income have a higher perception for the usefulness of spawning technologies. Its t–value was 3.311 indicating that farm income was significant at 1% level. The odd ratio was 2.147 and this indicates that farmers with higher farm earnings are likely to have two times higher level of perception for the usefulness of spawning technologies. The result suggests that higher farm income has some level of influences on farmer's level of perception. Findings of Taiye *et al*., (2006) supports this assertion. They stated that farmer's level of income to a large extent influences their level of perception of agricultural innovations.

The result for educational status of the respondents (b = 1.241; t = 3.001) was positively signed and significant at the 1% level. The implication of the result is that more educated farmers are bound to perceive more of the usefulness of the spawning technologies. Education plays a significant role in enhancing farmer's capacity to appreciate and comprehend the use of modern farm technologies. The odd ratio (2.201) suggests that farmers who are more educated are twice more likely to have a higher perception of the usefulness of the technology. This finding is in line with the assertion of Eze*et al*., (2006) which acknowledged that education enhances farmer's ability to adopt improved farm technologies that will enhance output and income.

Age, the fourth most important determinant (b = 0.728; t = 3.299) was positively signed and significant at the 1% level. The result implies that older farmers have higherperception for the usefulness of spawning technologies. The odd ratio was 3.071 and so indicates that older farmers are three times likely to have higher perception for the usefulness of spawning technologies. The result corresponds with that of Okwuokenye and Oriakhi (2014) which stated that older farmers put up a higher perception to fish production technologies and this enables them produce and have more income.

Years of residence was the fifth major determinant. Its beta coefficient and t-value were 0.408 and 2.096 respectively. The result was positively signed thus indicating that farmers who have stayed longer in their towns/communities have a higher perception of spawning technologies. The odd ratio was 1.621 which thus implies that the number of years the farmers have stayed in their respective communities islikely to have about 1.6 times level of perception of the usefulness of spawning technologies.

Farm size plays important role in the perception of the usefulness of spawning technologies. The beta coefficient (b = 0.346; t = 2.500) was positively signed indicating that larger farm owners are likely to have higher level of perception of the usefulness of spawning technologies. The odd ratio was 1.338 and this indicates that farm size have about 1.3 times level of perception of the usefulness of spawning technologies. This could be adduced to the fact that owners of larger farms are likely to be susceptible to technologies that are sure of improving productivity and income.

The seventh most important factor, farming experience of the respondents (b = 0.341; t = 3.109) was as well positively signed and significant at the 1% level. The result implies that the more experience farmers have, the more perception they would have on the usefulness of spawning technologies. The odd ratio (3.315) indicates that farmers with more farm experience are likely to have three times level of perception of the usefulness of spawning technologies. Madukwe (2005) supports this finding as he advanced that high farming experience will result to increased training and indoctrination of the farmers that would bring about increased productivity and revenue achieved through farmers perception of agricultural innovations.

Table 6: Respondents perception and usefulness of spawning technologies

Variables	Coefficient (b)	t-value	Odd Ratio
Constant	-4.400	-1.775	0.050
Household size	2.153*	4.826	2.413
Farm income	1.414*	3.311	2.147
Educational status	1.241*	3.001	2.201
Gender	0.924	0.710	0.133
Age	0.728*	3.299	3.071
Marital status	0.437*	0.306	1.504
Years of residence in community	0.408*	2.096	1.621
Farm size	0.346*	2.500	1.338
Farming experience	0.341	3.109	3.315

Adjusted R^2 = 0.617; X^2 51.88;
Percentage Correction Prediction = 70.24
Critical t (5% = 1.96)

CONCLUSION AND RECOMMENDATIONS

The study revealed that most of the farmers were strong and active (mean age = 45.19), of secondary education level, producing an average quantity of 3176.19 fishes and making sales of up to the tune of ₦328,095.24, thus implying that they were doing well in their fish business. The fish farmers had many sources from which they were reached with information on agricultural information especially on spawning technologies,the result of which they have put into practice and this has actually paid off well as revealed in the perceived benefits derived from spawning technologies. Different explanatory variables like household size (b = 2.153), farm income (b = 1.414), educational status (b = 1.241) and age of respondents (b = 0.728)had positive and significant influence on farmers perception on the usefulness of spawning technologies. Other variables that had same influence were years of residence of respondents in community (b = 0.408), farm size (b = 0.346) and farming experience of the respondents (b = 0.341)

Based on the findings of the study, it thus recommends that:

i. The farmers noted that print media was not among their regular sources of information on spawning technologies. Print media is still till date one of the cheapest medium of dissemination of information and so government through her agricultural agencies should try to have particular page or particular newspaper(s) made available on particular days where credible and viable information on agricultural production should be published. It is hoped that this will go a long way in disseminating such information to the farmers.

ii. Group meetings should also be seen as places where such information on agricultural innovations could be disseminated. These meetings could be made to be visited by agricultural extension officers who, as part of their agenda, should have a talk-show with the farmers on latest agricultural technologies (like the spawning technologies). In doing this, such lofty information cannot elude the farmers.

iii. Some of the farmers didn't see the need to select and weigh spawners before spawning. As part of spawning technologies, there is need to select spawners and be sure that they meet the required weight and inject with the ideal hormones as booster before using them to spawn. The reason for abiding to this rule is that it helps to transfer (through hereditary) the good weight of parents to the offsprings.

iv. Farmers should also ensure that spawning is carried out only around the fish ponds and not anywhere as some of the farmers indicated. It is also advised that the exercise of spawning should be carries out in the evenings.; and

REFERENCES

Adereti, F.O., Fapojuwo, O.E. and Onasanya, A.S. (2006). Information utilization on cocoa production techniques by farmers in Oluyole Local Government Area of Oyo State, Nigeria. *European Journal of Social Sciences.*3(1): 1 – 7

African Women Championship (2006).*AWC Special Souvenir* of the 5th Edition of the championship held in Delta State, Nigeria. A special publication of the Delta State sports organizing committee of the championship. PP 10 - 19

Aina, L.O., Kaniki, A.M. and Ojiambo, J.B. (2005). Preface in: Agricultural Information in Africa,

Aina,L.O., Kaniki, A.M. and Ojianbo, J.B. (eds) Ibada: Third WorldInformation Services. PP.23 - 26

Akinbile, L.A., Hussain, L.A. and Yekinni, O.T. (2008). CDAs/CBOs participation in community based poverty reduction projects in selected communities in Ekiti State, Nigeria. Nigeria Journal of Rural Sociology. 8(1): 41 - 47

Daudu, S., Chado, S.S. and Igbashal, A.A. (2009). Agriculture information sources utilized by farmers in Benue State, Nigeria. Patsunk Journal. 5(1): 39 - 48

Demiryurek, K., Erden, H., Ceyhan,V., Atasever A and Uysal, O. (2008). Agricultural information system and communication networks: The case of Dairy Cattle Farmers in Samsun Province of Turkey. Information Research 13: 343

De Watteville, A. and Gilbert, L. (2000). Advanced Information and Communication Technology Oxford Heinemann Educational Publishers.P. 157

Esobhawan, A.O. and Ogundele, S.L. (2011). Cost and returns analysis and the problems affecting artisanal fishing business in Esan South Local Government Area of Edo State, Nig1qqqqqeria. The Nigerian Journal of Agriculture and Forestry.3(1): 109 - 126

Ewuola, S.O. and Ajibefun, A.I. (2000). Selected media and socio-economic factors influencing innovations adoption by small-scale farmers: Empirical evidence from Ondo and Ekiti States, Nigeria, Applied Tropical Agriculture. PP.24 –26

Eze, C.C., Ibekwe, U. C., Peter, O. and Nwajiuba, C.U. (2006). Determinants of adoption of improved cassava production technologies among farmers in Enugu State of Nigeria. Journal of Agricultural Extension 2(1): 37 - 44

Food and Agricultural Organization (2005). Nutritional benefits of fish cuds. Retrieved at: Fao.org/docrep/168. On 24th February, 2017 Fish Hatchery: An important aspect of aquaculture by Peace. Retrieved at https://agronigeria.com.ng on 4th June, 2018

Madukwe, M.C. (2005). Agricultural extension administration. In: S.F. Adedoyin (ed.) Agricultural Extension in Nigeria.Agricultural Extension Society of Nigeria. PP. 182 - 185

Mohammad, H.U., Umar, B.F., Abubakar, B.Z. and Abdullahi, A.S. (2011). Assessment of factors influencing beneficiary participation in Fadama II project in Niger State, Nigeria. Retrieved at: http://www.ajol.info/index.php/njbas/article/view/73885 June 25, 2012

Nagujja, S. (2003). The relationship between socio-economic characteristics of maize farmers and household food security in Eastern Uganda. Journal of Rural Development.19(1): 2 - 12

Odebode, S.O. and Arimi, K. (2011). Contribution of homestead fisheries to household food security in Afijio Local Government of Oyo State, Nigeria.African Journal of Agricultural Research and Development. 4(3): 50 - 58

Ofuoku, A.U., Emah, G.N and Itedjere, B.E. (2008). Information utilization among rural fish farmers in Central Agricultural Zone off Delta State, Nigeria. World Journal of Agricultural Science 4(5): 558 - 264

Okwuokenye, G.F. and Oriakhi, H. (2014). Influence of socio-economic characteristics on the perception preference of fresh fish production in Delta State, Nigeria. NOUN Journal of Management and International Development. 1(2): 92 - 111

Oladele, O.I. (2006). Multi-linguality of farm broadcast and agricultural information access in Nigeria. Nordic Journal of African Studies.15(2): 199 - 205

Roy's farm: Advantages of artificial breeding of fish/modern fishing methods. Retrieved at: https: //www.roysfarm.com. 4th June, 2018

Salau, E.S., Lawee, G., Lukaaaaa, E. and Bello, D. (2014). Adoption of improved fisheries technology in Southern Agricultural Zone of Nasarawa State. Journal of Agricultural Extension and Rural Development. 6(11): 339 - 346

Taiye, O.F. Adebola, O.A. and Adebayo, E.K. (2006). Social activities and socio-economic state of rural farmers cultivating improved maize in Kaduna State, Nigeria. Global Approaches to Extension Practice.2(1): 29 - 36