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Fish Farmers' Access to Extension Information in Borgu Local Government Area of Niger State, Nigeria

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Oladeji J.O.[1] Olutegbe N.S.[2] and Aina I.M.[3]
Department of Agricultural Extension and Rural Development
University of Ibadan, Ibadan
[1]loisdaddy@yahoo.com, 08023250494
[2]siji004u@yahoo.com, 07032077856
[3]aina.irene@yahoo.com, 08055339594

Abstract
Fish farmers' access to extension information in Borgu Local Government Area of Niger State was investigated total of 120 fish farmers were interviewed. Frequency counts, percentages, PPMC and chi-square were used to analyse data. The majority (91.7%) were males, Christians (51.7%), married (58.3%). Also, 58.3% had fish farming experience of 1-10 years. Fish farming was the primary occupation for the majority (68.3%). The majority (95.8%) made use of earthen pond, while 50% earned between ₦50,000-₦70,000 per harvest. Fish farmers' most frequently accessed information were pond designing and construction (mean = 2.33), identification of suitable sites (mean = 2.38) and selection of fish species (mean = 2.43) while information on sorting (mean = 1.83), sexing (mean = 1.66), breeding (mean score = 1.78) and record keeping (mean = 1.80) were least accessed. The most serious constraints faced by the fish farmers were: long distance to accessing extension services (88%), bad road network (90%) and low extension agent to farmer ratio (83%). Significant relationship existed between constraints faced by the fish farmers in accessing extension services (r= -0.264), number of fishes stocked (r = 0.313) and fish farmers' access to extension information. Extension information is lacking in the early stage of fish production activities, with less emphasis on breeding. Extension agents should put in extra effort in providing information on every key stage of fish production.

Keywords: Fish production, information, extension services.

Introduction
Fish production is an important agricultural enterprise, as it helps generate income to farmers, while it also helps stimulate economic growth of the country. Central Bank of Nigeria (CBN, 2005) had asserted that fisheries occupy an important position in the agricultural sector of the Nigerian economy. The contribution of the fisheries sub-sector to GDP rose from N76.76 billion in 2001 to N162.61 billion in 2005 (CBN, 2005). However, the gap between supply and demand for fish in Nigeria is widening. Worse

still, almost all natural fish stocks in the country have been over-exploited, yet human populations, and hence demand, continue to increase. This is largely because fish farming has not also lived to its potentials. This therefore justifies the need to provide vibrant and efficient agricultural extension information, making dissemination of fish farming technologies a priority area. One of the ways by which this is being achieved over the years is the fishery extension. Fishery extension is seen as the promotion of any aspect of fish farming technology that bothers on how farmers acquire the necessary resources, how new technologies evolve, how such technologies are transferred to farmers, what influences farmers' choice, the kind of support a given technology requires and how its adoption can be facilitated and sustained. Like any other type of extension services, the major goal of fisheries extension is to encourage the adoption of disseminated technologies with an expectation of increased levels of production, better income, better standard of living and sustainability of the productive enterprise.

Access to accurate and adequate information on fish production technologies by farmers is essential for increased fish production. It is also important that the information provided is balanced, such that all stages of fish farming enterprise are covered. It is however not only important that such information be made available, they should also come from credible sources, at the right time, as this will facilitate ease of adoption. Information on fish farming technologies needed by farmers cover a wide range of areas, from pre-culturing, through culturing and post culturing stages. Such areas of fish farming for which information are often provided include pond construction and management, breed selection, stocking, feeding, water management, spawning, sorting, harvesting, processing, storage, marketing and record-keeping, among others (Ofuoku *et al*., 2008). Should these pieces of information be made available as at when due, it is expected that the widening gaps in protein intake will get narrowed on one hand, while farmers will also have their livelihood enhanced as well as improve the standard of living of the fish farming households on the other.

Borgu Local Government Area of Niger state is an area with ecological advantage in fish production. However, apart from this advantage, the LGA also benefits from the services of the Federal College of Fisheries and Aquaculture Technology. There is no doubt that over the years, fish farming related technology have been developed, while efforts have been made to disseminate such technologies to farmers. The ADP is also another important organization with the mandate of disseminating improved technologies on fish farming across to farmers. However, one will expect that farmers in Borgu and its environs will have consistent flow of information, and therefore this should see them through in improving productivity. Ironically, reports have indicated a rather dwindling than increasing quantity of fish being produced. This therefore raises question on whether farmers, the supposed beneficiaries, have access to such

information. It is therefore important to ascertain if fish farmers in this area which is presumed close to potential source of information on fish farming have access to such information which have been disseminated over the years. The specific objectives were to:

1.Identify the socio-economic and enterprise characteristics of the fish farmers;
2. examine farmers access to extension information; and
3. identify constraints faced by the farmers in accessing extension information.

Methodology

The study was carried out in Borgu Local Government Area (LGA) which happens to be an administrative region in Niger state, one of the 25 LGA in the state, with headquarters in the town of New Bussa. It has a land of about 10,000 square kilometer. The LA lies between 9^0N and 11^0N of the equator and longitude of 2^0E and 4^0E of the Greenwich. The LA is bounded to the north by Kebbi State, to the south by Kaima LGA of Kwara State, to the East by River Niger and Magama local government area of Niger State. The target population of the study was all fish farmers dwelling in Borgu local government area of Niger State due to their proximity to Kainji Lake for fishing activities. Multistage sampling procedure was used to draw a sample for the study. At the first stage, purposive sampling method was used in selecting New Bussa town out of the four (4) towns in the local government because of the prevalence of fish farming activities. A list of fish farmers was then obtained from fish farmers association while snow ball technique was used in generating another list of fish farmers who are non-members of fish farmers' association. Simple random sampling technique was used to select a total of 100 fish farmers from the two lists, which is the total sample size selected for the study.

To operationalize respondents' access to extension information, a list of possible extension information needs was presented to the fish farmers, from which they indicated their level of access to the services. This was measured as always accessed (3), occasionally accessed (2) and rarely accessed (1). Weighted mean for each of the extension information was obtained and used to rank respondents' level of access. A score of level of access to extension information was obtained for each of the respondent and used to categorize respondents into high access and low access, using the mean score as the benchmark. Constraints to accessing extension information on fish production was measured as respondents indicated based on level of severity, ranging from serious constraint = 2, partial constraint = 1, not a constraint = 0. An index of constraint was therefore obtained and used for hypothesis testing. Access to information was determined as respondents' scores for each of these sources were summed up and used for hypotheses testing. Frequency counts, percentages, means and standard deviation were the descriptive tools used in the analysis, while chi-square and Pearson Product Moment Correlation (PPMC) were

used for testing for significant relationship between selected variables and farmers' level of access to extension information.

Result and Discussion

Socio-Economic Characteristics

Table 1 shows that 42.2 percent of the respondents were between the age ranges of 21-30 with a mean age of 33.16. This age bracket is a productive age which portends better future for fish production. It is also considered as an economically active age (Olowosegun, Sanni, Sule, Bwala, 2004). The result also indicates that 91.7percent of the respondents were males. This implies that the majority of the fish farmers in the study area were males. The reason for this gap could be because of the tedious nature of the activities involved in fish production. This is in conformity with Brummett, Youaleu, Tiani and Kenmegne (2010) who observed that fishing activities are mostly dominated by men.

Table 1 also shows that 41.7 percent are single while 58.3percent are married. Ekong (2003) pointed out that marriage in our society is highly cherished. Fakoya (2000) asserted that marriage confers some level of responsibility and commitment on individual who are married, and this may be a factor in pushing farmers to access extension information on their fish production enterprises. Result on religion of respondents (Table 1) indicates that about half (51.7 percent) are Christians while 48.3percent of them are Muslims. This suggests that Christians are predominant in the study area. The findings further show that no religious group kicks against the production of fish in the study area. Education is very essential for development because it enables individuals to broaden their minds and help in taking important decision regarding acceptance of innovations. It is also an important factor to bringing about desirable changes in farmers' attitude, skill and knowledge. A good number of the respondents (34.2 percent) who had above secondary school education therefore is an indication that agricultural extension information can be disseminated across an array of sources for a more effective fish farming activities in the study area.

Table 1 shows that the mean years of farming experience is 11.59. The majority (58.3 percent) of them had been practicing fish farming for about 1-10 years, while 3.3 percent had between 31-40 years of experience. The implication of the result is that the majority of the respondents have been into fish farming for only a short duration. Long years of experience would have necessitated them to know the trends and changes that may be associated with fish farming, and this may affect their information seeking behaviour, and hence, access to extension information. Result also shows that 68.3 percent of the respondents have their source of credit facilities from personal savings while 0.8 percent of them obtain credit facilities from agricultural bank. This implies that it is a common practice that the profits of previous harvest are ploughed back into the

business. It is therefore an indication that if the profits made are not enough to cater for both the family and to continue the business, the fish farming enterprise are left on hold due to stringent conditions of obtaining loan from banks. This finding is in agreement with Omitoyin (2007) who states that the number of operational fish farms in the country has reduced significantly as a result of lack of funds. The result further clearly states that 95.8 percent of the respondents make use of earthen pond while 4.2 percent make use of concrete pond. This can be attributed to the fact that concrete pond construction is costly and moreover fishes perform better in earthen pond where the natural aquatic animals eaten by the fishes serve as supplement to the artificial feed, unlike in the concrete where intensive feeding needs to be done good fish performance. This is evident in the findings of Adebayo and Adesoji (2008) who reported higher profit from earthen pond raised fishes than concrete tank raised ones. The study of Reginald and James (2014) also shows that the type of culture medium used and its management could have a significant influence on fish profitability.

Table 1 reveals that 71.7 percent of the respondents' culture catfish, while 28.3percent of them culture both catfish and tilapia. Adewolu, Ogunsanmi and Yunusa, (2008) had asserted that in Africa, especially in Nigeria, the species mostly cultured are *Clarias gariepinus* (catfish) and their hybrids. About 58 percent of the respondents' cultured up to 2,000 fishes per season. This implies a subsistence level of fish production. The choice of quantity of fishes cultured is usually influenced by factors such as inadequate fund, lack of access to land or low feeding capacity. Thirty-three percent of respondents acquired land used for fish farming by purchasing it.

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Table 1: selected socio-economic characteristics of respondents

Variables	F	%	Mean±SD
Age			
≤ 20	6	5.0	
21-30	53	44.2	
31-40	37	30.8	33.16±8.53
41-50	20	16.7	
>50	4	3.3	
Sex			
Male	110	91.7	
Female	10	8.3	
Marital status			
Single	50	41.7	
Married	70	58.3	
Religion			
Christianity	62	51.7	
Islam	58	48.3	
Level of education			
No formal education	26	21.7	
Primary education	12	10.0	
Secondary education	21	17.5	
National diploma	13	10.8	
Higher national diploma	41	34.2	
University	7	5.8	
Main occupation			
Fish farming	82	68.3	
Civil servant	33	27.5	
Trading	5	4.2	
Type of pond			
Earthen	115	95.8	
Concrete	5	4.2	
Earthen	115	95.8	
Years of farming experience			
less or equal 10	70	58.3	
11-20	32	26.7	11.59±9.34
21-30	14	11.7	
31-40	4	3.3	
Source of credit facilities			
Agricultural bank	1	0.8	
cooperative society	13	10.8	
friends and family	24	20.0	
personal savings	82	68.3	
Type of fish cultured			
Catfish	86	71.7	
Tilapia	00	0.0	
Both	34	28.3	
Number of fishes cultured			
less or equal 2000	70	58.3	
2001-4000	28	23.3	
4001-6000	12	10.0	2845.75 ± 2107.70
6001-8000	6	5.0	
>8000	4	3.3	

Source: Field survey, 2015

Constraints to accessing extension information by fish farmers

Table 2 presents the distribution of respondents based on their constraints to accessing extension information in the study area. The study reveals that of the identified constraints, long distance to accessing extension services ($\bar{x}$ = 1.64), bad road network ($\bar{x}$ = 1.61) and low extension agents to farmers ratio ($\bar{x}$ = 1.57) were the most severe

constraints to farmers access to extension information of fish production in the study area. This finding agrees with the findings of Amusat, and Sangotegbe, (2014), who ranked inadequate extension contact as a major constraint to livestock production in Nigeria. The low ratio can however be mitigated as suggested by FAO (2011) by incorporating into the extension department of the agricultural sector more well-trained, experienced and innovative extension service providers to educate farmers on ways of improving farm productivity sustainably using superior, yield-enhancing technologies. This may also be due to the fact that extension activities in Nigeria place more emphasis on crop farming than livestock and associated activities.

However, cultural belief ($\bar{x}$ = 0.28), lack of interest on the part of respondents ($\bar{x}$ = 0.56) and nonchalant attitude ($\bar{x}$ = 0.66) were rated as the least serious constraints to accessing extension information in the study area. This implies that the respondents' cultural belief affords them the opportunity to access extension information without any hindrances. The report of the study also suggests that the fish farmers are interested in obtaining information from the extension agents owing to the high percentage of responses.

Table 2: Respondents' constraints to accessing extension services

Constraints	Mean	SD	Rank
Cultural belief	0.28	0.56	12
Low literacy level	0.90	0.78	7
Nonchalant attitude of fish farmers	0.66	0.79	10
Lack of cooperation among farmers	0.83	0.79	8
Lack of awareness of extension services	1.14	0.89	5
Low extension agent to farmer ratio	1.52	0.78	3
Lack of competence of extension agents	0.97	0.88	6
Long distance to accessing the extension services	1.64	0.65	1
Bad road network	1.61	0.73	2
Language barrier	1.20	0.88	4
Complexity of information released	0.83	0.87	8
Lack of interest	0.56	0.74	11

Source: field survey (2015)

Access to Extension Information on Fish Production

Table 3 presents the distribution of respondents' access to extension information on fish production activities. The table shows that information of health issues and management practices were the most accessed. Specifically, the most accessed were

on general fish health issues $\bar{x}$ = 2.53), disease treatment ($\bar{x}$ = 2.48) and disease identification ($\bar{x}$ = 2.47). On the other hand, however, the study reveals that respondents least accessed information on reproduction and related practices. It shows that information of fish sexing ($\bar{x}$ = 1.66) and breeding (1.78) were specifically the least accessed information. The study further reveals that information on record keeping (fish sexing ($\bar{x}$ = 1.66) and breeding ($\bar{x}$ = 1.78). The result of this finding is in line with that of Ofuoku, Emah and Itedjere (2008) which posited that fish farmers need information on fish farming technologies, construction and management, breeds and spawning, processing, storage and marketing. It further shows that the fish farmers in the study area only have access to information about the pre-culturing and post-culturing activities in fish production while information on the culturing activities which makes up the bulk of production and the backbone of the enterprise is lacking. Information on fish production should however not focus on pre-culturing activities alone but also delve into other aspects up to the point of sale. This is in line with that of Oladele (2006) which argues that information is vital for increasing production and improving marketing and distribution strategies. Lwoga (2010) also asserted that many of the fish farmers need information about marketing of their agricultural produce for better profits.

Table 3: Respondents' access to extension services on fish production $\bar{x}$

Extension need	Mean	Rank	SD
Pond designing and construction	2.33	8	0.91
Identification of suitable sites	2.38	5	0.86
Selection of fish species	2.43	4	0.79
Pond fertilization	1.83	14	0.91
Liming	1.84	13	0.91
Sorting	1.83	14	0.89
Fish sexing	1.66	17	0.80
Breeding	1.78	16	0.92
Feed formulation	2.21	10	0.88
stocking density	2.09	12	0.79
Fish health	2.53	1	0.66
Water quality	2.11	11	0.86
Disease identification	2.47	3	0.78
Disease treatment	2.48	2	0.76
Processing	2.38	5	0.81
Preservation	2.36	7	0.83
Marketing	2.32	9	0.89
Record keeping	1.80	15	0.88

Source: field survey, 2015

Table 4: Respondents' levels of access to extension services

Levels of access	Percent	Mean	SD	Minimum	Maximum
Low	49.2	38.83	8.65	18.00	54.00
High	50.8				

Socio-Economic Characteristics and Fish Farmers' Access to Extension Information

There is no significant relationship between the respondents' sex (χ^2 = 0.512; P= <0.05) and access to extension information. This means there is no disparity between male and female fish farmers in accessing extension information. This finding contradicts that of Matata , Ajaisil, and Aguniyi, (2008) which noted that there is a bias against women in the delivery of extension message, with extension messages generally provided by male extension agents to men with the implicit assumption that such messages will trickle down to the women. The study also reveals that none of marital status, educational level and religion had any significant relationship with access to information on fish farming.

Table 5: Association of socio-economic characteristics and fish farmers' access to extension information

Variables	**χ^2value**	**Df**
Sex	0.512*	1
Marital status	0.344*	1
Education	0.746*	5
Religion	1.620*	1

*P ≥0.05

Relationship Between Selected Socio-Economic Characteristics and Fish Farmers Access to Extension Information

Table 6 is a Pearson product moment correlation analysis showing relationship between other selected socio-economic characteristics which are age, years of farming experience and number of fishes stocked and the fish farmers access to extension information. There is no significant (p ≥0.05) relationship between respondents' age and their access to extension information (p=0.201). This suggests that all age groups had near-same levels of interest in obtaining information. This is in contradiction to the findings and conclusion of Mesike, Ugwa and Esekhade (2012) that aging farmers are less able to source information and engaged in modern agricultural practices. The table further reveals that there is no significant (p value) relationship between respondents' years of experience and access to extension information (p=0.550). A significant relationship exists between number of fishes stocked by the fish farmers and access to

extension information. This suggests that the more information the fish farmers obtain concerning fish production, it helps boost their level of production, income level and consequently raise their standard of living leading to a robust national economy as a whole.

A significant (r= -0.264; P = <0.004 relationship exists between constraints and fish farmers' access to extension information). This implies that the higher the level of constraints faced in accessing extension information, the lower their access to such services. It simply means that access to extension information is significantly limited by constraints to availability of such information.

Table 6: Relationship between socio-economic characteristics, constraints to accessing extension information and fish farmers' access to extension information

Variables	r
Age	0.117
Years of experience	-0.055
Number of fishes	0.313*
Constraints	-0.264*

*P ≤0.05

Conclusion and Recommendation

Constraints fish farmers face in accessing extension information include long distance, inaccessible road and low extension agents to farmer ratio, and they have a combining effect in reducing, significantly, the level of access to extension information among farmers in the study area The study finally concludes that the fish farmers' level of access to extension services on pre-production and post-production phases of fish farming is high, while access is low for production phase of the fish farming cycle. Access road linking production site and market should be provided by the government for the fish farmers in the study area to ensure ease of access to information. Accessible road network will also motivate extension agents in carrying out their obligations effectively. Outcome of research should not just end up in the shelves of the research institutes, rather, the linkage system should be strengthened between the research institutes and extension agents who are experts in disseminating information to the fish farmers.

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