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Socio-economic Factors Influencing Artisanal Fishers' Participation in Training on Modern Fishing Practices in North Central, Nigeria

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ABSTRACT

The study determined the factors influencing the artisanal fishers' participation in training on modern fishing practices in North Central, Nigeria. Data were collected with the use of a questionnaire and analyzed using frequency, percentage, mean and Binary Logistic Regression. The results revealed that about 76.8% of the respondents had not participated in any training on modern fishing practices, less than half (29.2%) of the respondents who prefers home visit by extension agents had participated in training on fishing practices, more than half (63.5 %) of the respondents who prefers group discussion method had not participated in any training on fishing practices, the majority (68.5 %) of the respondents who preferred radio had not participated in any training in fishing practices and less than half (44.8%) of the respondents who prefers training in the evening had not participated in any training on fishing practices. The socio-economic factors influencing the fisherfolks' participation in training on modern fishing practices were marital status, quantity of catch, craft type, contact with extension, number of fishing trips, educational status and other supportive occupation ($P \leq 0.10$). The study, therefore, recommends that before the planning and implementation of any training programme, the socio-economic determinant factors of participation in training on modern fishing practices should be considered and the training should be based on the fisherfolks needs.

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INTRODUCTION

The agriculture plays an important role in the process of economic development of any country. The agricultural sector provides food for human consumption, raw materials for the industries and also serves as a source of foreign exchange earnings

for Nigeria. The Agricultural sector in Nigeria is characterized by low productivity, low technology and high labour intensity (International Institute of Tropical Agriculture [IITA], 2017). The Nigerian agricultural sector has several untapped potentials for growth and development in the availability of land, water, labour and large internal markets. The Nigerian agricultural sector is made up of four sub-sectors, namely crop production, livestock, forestry and fisheries. The fishing sub-sector of Agriculture is important to the Nigerian economy as it contributed about 1.64% to the Nigerian GDP in the year 2018 from 1.34% in the year 2017 (NBS, 2019).

The artisanal fishery is the largest employer of labour in the Nigerian fishing industry as about 10 million people are fully engaged in the fishery sub-sector in Nigeria and it is also responsible for the bulk of domestic fish production in Nigeria (FAO, 2017). According to Ogunsola (2019) and FAO (2017), more than 80 percent of the total domestic fish production in Nigeria is generated by artisanal small scale fisherfolks from coastal, inshore, creeks of Niger delta, Lagoons, inland rivers and lakes. Nigeria's overall fish supplies come from four major sources; the sources are importation (56%), inland artisanal fishery (37.6%), industrial trawl fishery (2.6%), and Aqua-culture (3.8%) (Dambatta and Sogbesan, 2015).

Artisanal fishing involves the use of small scale and less technology for fishing activities. Artisanal fishing is the process of capturing fish from the natural water using traditional fishing gears and crafts (Ifabiyi, 2019; Ifabiyi et al., 2017). Artisanal fishing provides income and employment for the fisher folks and supplies cheap protein. Onuoha, (2009) stated that artisanal fisheries are labour intensive, involve very low capital investment and lacks infrastructure facilities such as cold storage and processing plants. The fishing settlements are highly scattered in remote and inaccessible road networks which makes evacuation, distribution and marketing of their fish rather difficult.

Training is the effort geared towards improving the level of knowledge, skills and attitude possessed by an individual for proficiency in a given task or job. Training would improve the skills, knowledge and attitude of the fisherfolks (Ifabiyi, 2019). Participation in training is essential for professional development. Participation in training is vital as it provides participants with adequate knowledge and skills that can improve their production, income and standard of living. The artisanal fisheries could contribute to national economic growth if they received opportunities to become more productive as the population increases, and the demand for fish and fish products also increases. The participation of the fisherfolks in training on modern fishing practices and technologies, knowledge and adherence to sustainable fishing practices would make fish to be available continually in the water bodies, ensure the production of good quality fish products and would maximize the profit of the fisherfolks (Adisa et al., 2020).

However, in Nigeria, fisheries extension services had been reported to be ineffective and not properly organized (Samson, 2006). Therefore, the artisanal fishers might not participate in any training on modern fishing practices as extension services towards artisanal fisheries are ineffective and not properly organized. The technology and practices in artisanal fishery in Nigeria are crude and involved unhygienic activities (Ifabiyi, 2019). This resulted in high post-harvest losses of between 30 – 50 % Olowoniyan et al. (2013) and poor-quality fish products. The crude technology and practices often have a profound impact on the fisherfolks' livelihoods, the other value chain actors and the Nigerian economy as a whole. There is dearth of information on the factors influencing artisanal fisherfolks' participation in training on Modern fishing practices. Hence there is need to examine the socio-economic factors influencing artisanal fishers' participation in training on Modern fishing practices in North Central, Nigeria.

The specific objectives were to:

1. Ascertain the fisherfolks' participation in training on modern fishing practices in the study area.
2. Assess the fisherfolks' level of satisfaction with training on artisanal fishing practices in the study area
3. Describe the association between the participation in training on modern fishing practices and preferred extension methods and the time of acquiring training in the study area.
4. Determine the factors influencing artisanal fishers' participation in training on Modern fishing practices in the study area.

MATERIALS and METHODS

This study was carried out in Kogi and Kwara States, North Central, Nigeria. The population for the study consists of all the fisherfolks in North Central, Nigeria. A Four-stage sampling procedure was used to select the respondents for this study. The first stage involved a purposive sampling of Kogi and Kwara States as the two states are alone the River Niger Bank. The second stage involved a purposive sampling of three (3) fishing local government areas (LGA)s in Kogi state and two (2) fishing LGAs in Kwara state along the Bank of the River Niger where there is a high rate of fishing activities. Selected LGAs in Kwara state were Patigi and Edu while selected LGAs in Kogi state were Lokoja, Idah and Kogi LGAs. The Third stage involved random selection of 5 fishing communities from each selected local government areas in Kwara and Kogi state, Nigeria. The fourth stage involved a random selection of 20 artisanal fishers from each fishing communities from the list of registered artisanal fisherfolks with the Fishery Department under the Ministry of Agriculture and Natural Resources in Kwara and Kogi States respectively. The total number of

respondents for this study was 488 artisanal fishers. To determine participation in training on modern fishing practices, a scale of yes and no, where Yes=1 and No =0. To determine the level of satisfaction with previous training on artisanal fishing practices, 3-point likert type scale was used where high=3, moderate=2 and low=1. Pearson Chi-Binary analysis was used to show the association between the participation in training and extension methods. Logistic regression analysis was used to determine the factors influencing participation in training. Data were analysed using frequencies, mean, percentages, Pearson Chi-Square, and Logistic regression analysis.

RESULTS and DISCUSSION

The result in Figure 1 revealed that the majority of the respondents (76.8%) had not participated in any training on modern fishing practices. This implies that the majority of the fisherfolks had not participated in any training on modern fishing practices. This result is in line with the findings of Samson (2006) who reported that fisherfolks have inadequate access to training on artisanal fishing practices in Nigeria. Training can also be used to increase fisherfolks' learning capabilities and work effectiveness (Ifabiyi, 2019). This denotes that fisherfolks' participation in training on modern fishing practices will improve their output as training has been reported to improve productivity (Tharenou et al., 2007).

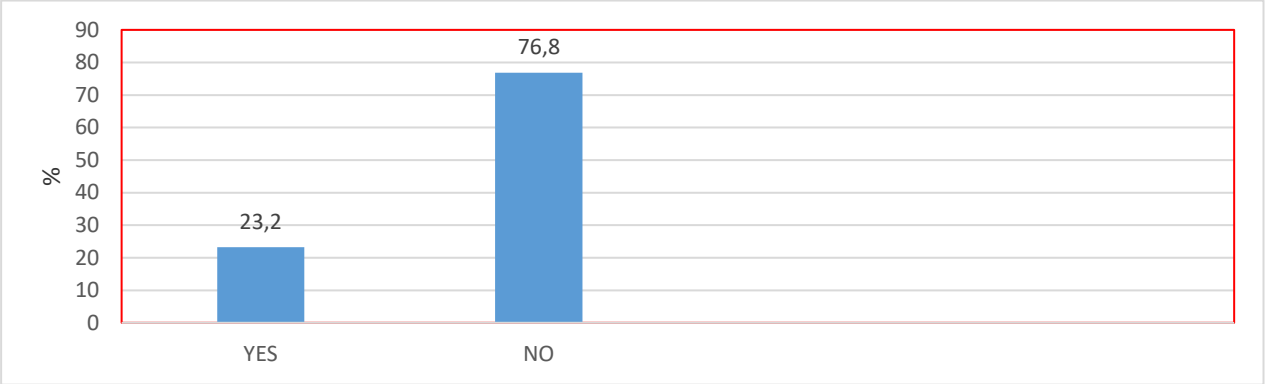

Figure 1. Distribution of Respondents by Level of Participation in Training on Modern Fishing Practices

The result in Figure 2 revealed that more than half (54.9 %) had low satisfaction with the previous training on artisanal fisheries. 33.6 % had high satisfaction while 11.5 % of the respondents were not satisfied with the previous training on artisanal fisheries. This implies that fisherfolks derives satisfaction from any training programme that addresses their needs. The implication of the majority having low satisfaction with the training attended on artisanal fisheries might be due to the provision of training without taking into cognizance the needs of the fisherfolks as Schmidt (2009) reported that training should be designed and implemented to meet the needs of the trainees.

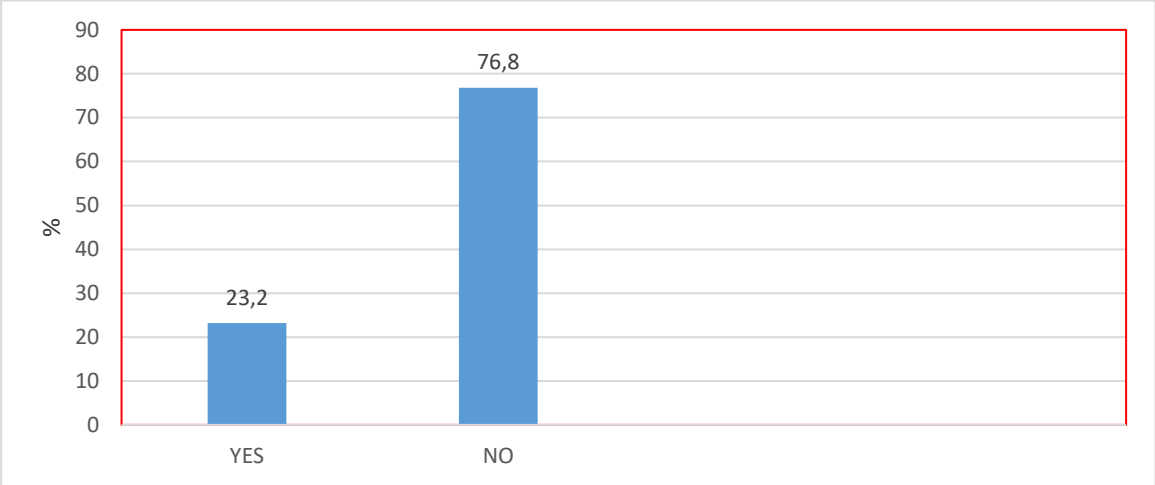

Figure 2. Distribution of Respondents by Level of Satisfaction in Previous Training on Artisanal Fishing Practices

The result in Table 2 showed that less than half (29.2%) of the respondents who prefers home visit by extension agents had participated in training on fishing practices. The result of test of association indicates a significant relationship between the individual methods and participation in training (χ^2=15.353; p< 0.05). This implies that the use of individual extension methods (home visits, fishing ground visits and telephone) would influence the fisherfolks' participation in training. This further implies that the more consistently the extension agents use the individual extension method, the greater would be the participation of fisherfolks in training on fishing practices. This result is in line with the findings of Adeokun and Adereti (2005) who reported that the individual extension teaching method was effective in disseminating improved technologies on artisanal fishery practices.

The result in Table 2 also revealed that more than half (63.5 %) of the respondents who prefer group discussion method had not participated in any training on fishing practices. The result of test of association indicates a significant relationship between the group methods and participation in training (χ^2=21.068; p<0.05). This implies that the use of group methods (group discussion, demonstration method and field trip) would influence the fisherfolks' participation in training.

Table 2. Cross tabulation of participation in training on modern fishing practices and preferred extension methods and preferred time.

	Participation in Training				
	No		Yes		
Preferred Extension Methods and Time	**Frequency**	**Percentage**	**Frequency**	**Percentage**	**X^2**
Individual method					
Home visit	99	26.4	33	29.2	15.353
Fishing ground visit	266	70.9	69	61.1	df=6
Telephone	13	3.5	11	9.7	**p=0.018 S**
Group Method					
Group Discussion	238	63.5	52	46.0	35.946
Demonstration method	70	18.7	30	26.6	df=2
Field Trip/Excursion	67	17.9	31	27.4	**p=0.000 S**
Mass Method					
Radio	257	68.5	43	38.1	61.252
Television	60	16.0	14	12.4	df=6
Pamphlet/Posters	58	15.5	56	49.5	**p=0.000 S**
Preferred Time to Acquire Training					
Morning	73	19.5	55	48.7	56.347
Afternoon	73	19.5	10	8.8	df= 9
Evening	168	44.8	22	19.5	**p=0.000**
Any period/Time	61	16.3	26	23	**S**

Source: Author's Field Survey 2019: Note: χ^2 = Chi-Square test, df = Degree of Freedom, P = p-value, S= Significant ($p<0.05$),

This result shows that fisherfolks' participation in training largely depends on the use of several educational methods by extension agents. This further implies that the more consistently the extension agents use the group extension methods, the greater would be the participation of fisherfolks in training on fishing practices. The combinations of different extension methods will make extension services to be more effective as Jone et al. (2010) reported that the use of group method in extension information delivery maximizes programme efficiency and effectiveness.

The result in Table 2 revealed that the majority (68.5%) of the respondents who preferred radio had not participated in any training in fishing practices. The result of

test of association indicates a significant relationship between the mass method and participation in training (χ^2 =17.593; p<0.05). This implies that the use of the mass methods would influence the fisherfolks' participation in training. The result in Table 2 showed that less than half (44.8%) of the respondents who prefer training in the evening had not participated in any training on fishing practices. The result of the test of association indicates a significant relationship between the preferred time to acquire training and participation in training (χ^2=56.347; p<0.05). This implies that the time of conducting training on fishing practices would influence the fisherfolks' participation in training. The result infers that extension agents should take into consideration the accurate timing of training on fishing activities. This result is in agreement with the findings of Adeokun and Adereti (2005) who reported that a good training program on artisanal fisheries may be frustrating if the timing is wrong.

Table 3. Result of logistic regression analysis to identify factors influencing the artisanal fishers' participation in training on modern fishing practices

Variables	Coefficient	Standard Error	z-value	p-value
Constant	-3.14743	1.2874	-2.44	0.014
Age	0.0157	0.0119	1.33	0.185
Marital status	**0.8059*** **	0.2765	2.91	0.004
Education status	**0.2313***	0.0131	1.91	0.056
Years of Fishing Experience	-0.0126	0.0130	-0.97	0.334
Income	3.87e-06	4.07e-06	0.95	0.341
Household size	0.0064	0.0324	0.20	0.845
Labour Type	0.0523	0.1472	0.36	0.772
Membership of Fishing Association	**0.3309***	0.1957	1.69	0.091
Quantity of catch	**0.0391*** **	0.0094	4.12	0.000
Contact with Extension	**0.2168** **	0.1076	2.01	0.044
Other Supportive occupation	**-0.3282***	0.1686	-1.95	0.052
Craft Type	**-0.4979*** **	0.1521	-3.27	0.001
Number of fishing trip	**-0.5743** **	0.2711	-2.12	0.034

Prob > Chi^2= 0.001
Pseudo R^2 = 0.213
Log likelihood = -213.8516

Source: Author's Field Survey 2019, Note: ***, **, *, Significant at 1%, 5% and 10% levels respectively

The Binary Logistic Regression Model with eight predictors produced Pseudo R^2 =0.213, P<0.001. The Pseudo R-squared value indicates that 21.3 percent of the variation in the participation in training on fishing practices by the fisherfolks is explained by the independent variables. It has been opined that studies in fields that attempt to predict human behaviour typically have low R^2 values as humans are harder to predict than physical processes (Martin, 2012). According to Martin (2012), If R^2 values are low but there are statistically significant predictors, it is possible to draw important conclusions about how changes in the predictor values are associated with changes in the response values.

Marital Status: The result in Table 3 showed that marital status has a positive coefficient (0.8059) and also a determinant of participation in training on fishing practices (p<0.01). This implies that marital status has influenced on participation in training. Marriage is expected to influence fishing practices as family members might be involved in the fishing activities. The implication of this is that most of the fisherfolks have family responsibility ties that will require more financial commitment which may serve as an impetus for them to participate in training on fishing practices that will enhance their fishing capacity and livelihood. This result is in agreement with the findings of Acquah and Abunyuwah (2011) who identified marital status as one of the socio-economic determinants of participation in training.

Educational Status: has a positive coefficient (0.2313) and also a determinant factor of participation in training (p<0.10). This suggests that an increase in the level of education will likely increase the fisherfolks' participation in training. The implication of this is that the respondents' educational attainment will influencing their participation in training on improved fishing practices. The ability to read and write will enhance the fisherfolks' capacity to learn and be positively disposed to learning improved fishing skills. This study is in agreement with the findings of

Obaniyi et al. (2014) who reported that educational level had a positive effect on the participation of rice farmers in training programme in Kwara State, Nigeria.

Membership of Fishing Association: has a positive coefficient (0.3309) and also a determinant factor of participation in training ($p<0.10$). This implies that membership in fishing organizations is an important factor in inducing fisherfolks to participate in training. This indicates that information will easily and quickly flow to the fisherfolks if it is passed through the association. This infers that training on fishing practices can also be effectively conducted through the use of established fishing associations. This result is in agreement with the findings of Olwande and Mthenge (2011) who reported that membership in farming association increases the farmers' participation in market intervention programmes for rural poor people in Kenya.

The Quantity of Catch: has a positive coefficient (0.0391) and also a determinant factor of participation in training ($p<0.01$). An increase in the quantity of catch will increase the fisherfolks' participation in training. The quantity of catch could motivate fisherfolks to participate in training on improved fishing practices to sustain their level of production and income from artisanal fishing practices. This result is in agreement with the findings of Tijani, (2018) who reported a significant relationship between production output and participation in Shea butter marketing in Kwara State, Nigeria.

Contact with Extension Services: has a positive coefficient (0.2168) and also a significant factor influencing fisherfolks participation in training ($p<0.05$). This implies that the higher the number of contacts with extension services, the higher the fisherfolks' propensity to participate in training. This may be due to the quality of extension services provided and the attitudes of the extension agents to the fisherfolks. This result is in agreement with the findings of Omotesho et al. (2016) who reported that contact with extension service is one of the determinant factors of farmers' participation in group activities in Kwara State. This is expected as

agricultural extension service is a veritable tool in technology dissemination which will enhance the fisherfolks' knowledge and ability to acquire more skills.

Other Supportive occupation: has a negative coefficient (-0.3282) and has an inverse relationship with participation in training ($p<0.10$). The higher the fisherfolks' involvement in other supportive occupations, the lower their likelihood of participating in training. Those with other supportive occupations may not participate in any training on fishing practices as some of them might be too busy to attend the training. This implies that the involvement of fisherfolks in other supportive occupations will limit their participation in training on fishing practices. This result is also in agreement with the study of Acquah and Abunyuwah (2011) who reported that other sources of income are one of the factors influencing artisanal fisherfolks' participation in training on fishing practices. According to Martey et al. (2012), the negative effect of other supportive occupations on the likelihood of participating in training indicates that there is a strong competing effect of diverting the fisherfolks' capabilities, strength and time on other employment opportunities.

Craft Type: has a negative coefficient (-0.4979) and has an inverse relationship with participation in training ($p<0.01$). A unit increase in a number of craft used for fishing activities will decrease the fisherfolks' participation in training. This implies that the acquisition of additional fishing craft might limit their participation in training. This is expected as the fisherfolks will spend more time and energy on fishing operations. This result is in contrast with the findings of Binyam (2011) who reported that craft type has a positive and significant effect on the catch level of artisanal fishers in Eritrea.

Numbers of Fishing Trips: has a negative coefficient (-0.5743) and has an inverse relationship with participation in training ($p<0.05$). This implies that increase in the number of fishing trips will reduce the fisherfolks' participation in training. This denotes that increase in the number of fishing trips will limit their participation in

training as fishing is a tedious and time-consuming occupation. This finding is in agreement with the study of Quagrainie and Chu (2019) on determinants of catch sales in Ghanaian artisanal fisheries who reported that the number of fishing trips is a determinant factor of participation in Fisherfolks-mongers' partnership on sales of fish catch in Ghana.

CONCLUSION and RECOMMENDATION

Based on the findings of this study, the study concluded that the majority of the fisherfolks had not participated in any training on modern fishing practices. More than half of the fisherfolks had a low level of satisfaction with the previous training on artisanal fishing practices. The use of individual, group and mass extension methods has influence on the fisherfolks' participation in training on modern fishing practices. Marital status, educational status, membership in fishing association, quantity of catch and contact with extension services positively influenced the fisherfolks' participation in training on modern fishing practices. The Supportive occupation, craft type and number of fishing trips negatively influenced the fisherfolks' participation in training on modern fishing practices.

The following recommendations were made;

1. That before the planning and implementation of any training programme on modern artisanal fishing practices, there should be consideration of factors influencing participation of artisanal fisherfolks in training such as educational status, the quantity of catch, craft type, contact with extension, number of fishing trips and other supportive occupation.
2. Extension service deliveries to the fisherfolks should be based on their needs.
3. Extension service deliveries should involve the use of individual (home visits, fishing ground visit and telephone calls), Group (group discussion,

demonstration and field trip) and mass (radio, television, and pamphlet/posters) form of extension teaching methods.

Conflict of Interest

The authors have declared no conflicts of interest.

Authors Contribution

The authors contributed equally to the article.

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