

## **Artisanal Fishers' Accessibility To Fishery Information In Coastal Communities of Southwest, Nigeria**

**<sup>1</sup>Oose, M. O., <sup>1</sup>Banmeke, T. O. A., <sup>2</sup>Olaoye, O. J. and <sup>3</sup>Umunna, M. O**

*<sup>1</sup>Department of Agricultural Extension and Rural Development,  
Federal University of Agriculture, Abeokuta, Nigeria*

*<sup>2</sup>Agricultural Media Resources and Extension Centre (AMREC),  
Federal University of Agriculture, Abeokuta, Nigeria*

*<sup>3</sup>Federal College of Wildlife Management, New Bussa, Niger State.  
[oosematthew@gmail.com](mailto:oosematthew@gmail.com); 08060348644*

### **Abstract**

This study assessed artisanal fishers' access to fishery information in coastal communities of Southwest, Nigeria. A total of 214 artisanal fishers were selected using a multistage sampling procedure. Data were analysed using mean, standard deviation, percentages, frequency, Logit regression model, chi – square and analysis of variance. Findings revealed that 38.3% of the respondents were between the ages of 30 and 40 years, 37.4% had 11-20 years of fishing experience with the fishery information needs being met through indigenous knowledge (98.6%). Furthermore, artisanal fishers were mostly accessible to fishery information pertaining to appropriate mesh size ( $\bar{x} = 1.86$ ), use of scale ( $\bar{x} = 1.84$ ) and fishing gear weight ( $\bar{x} = 1.73$ ). Age of fishers, number of years spent in school, number of years spent in community and fishing trip covered in a week were the major determinants of accessibility to fishery information. Furthermore, a positive relationship existed between the sources of information and accessibility by fishers. Also, a significant difference existed in the artisanal fishers' access to fishery information across the study locations. It was therefore recommended that good road network be put in place in the fishing communities and extension messages packaged in form of mobile phone short message services for dissemination to the fishers in their local languages.

**Keywords:** Fishery information; accessibility; artisanal fishers; Nigeria

### **Introduction**

The role being played by artisanal fishers in food production which enhances the level of food security of households in many developing countries, particularly Nigeria, is quite enormous. This can be adduced to the fact that artisanal fishing accounts for more than 80% of the total fish production in Nigeria while aquaculture accounts for less than 8% and industrial fishing fluctuates with the peak of 13.9 and minimum of 5.0% (Federal

Department of Fisheries, 2011). World Fish Centre (2005) and Faturoti (2010) both reported that artisanal fishers make vital contribution to the food and nutrition security of about 200 million Africans. Moreover, they provide more than 82% of the domestic fish supply and enhance the livelihoods of thousands of fishers in Nigeria.

In order to maintain and sustain the contribution of artisanal fishers to food production and security, it becomes

imperative to provide them with relevant resources and information that will enhance their productivity. This assertion was subscribed to by Daddy and Falaye (2004), Jamaica Documentary (2005) and FAO (2003) who opined that artisanal fishing contributes significantly to the food requirement of the economy, making up to about 85 to 90% of domestic population. Artisanal fishing also contributes direct and indirect employment to over 100,000 persons and contributes to the local economy of many fishing communities. Therefore, it becomes imperative to provide artisanal fishers with relevant information.

In recent times, information is asserted to be the fifth factor of production and the most effective. This is corroborated by Banmeke and Olowu (2005), who posited that productive resources in modern times goes beyond factors such as land, labour, capital and entrepreneurship but includes a factor such as information. Buckland (1991) cited in Banmeke and Olowu (2005) maintained that information is regarded as a vital resource in the production process and becomes intuitively plausible in this age of global information and communication flow.

Furthermore, information is needed because it affects people's lives and people need information to obtain answers to specific questions (Nicholas, 2000). Information needs arise when a person recognises a gap in his/her state of knowledge and desires for a change. It is a cognitive experience that represents gaps in the current knowledge of information users (Devadason and Lingam, 1997).

According to Oose *et al.*, (2015), the information needs of artisanal fishers, particularly in coastal areas revolve around their socio-economic needs such as modern techniques which are needed to enhance fish productivity e.g. outboard engine maintenance, outboard engine safety, fishing injuries, fishing craft protection, weather forecast, fishing gear among others.

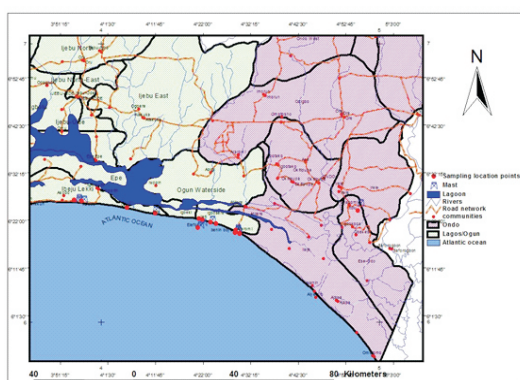
It is of no doubt that fisheries information is very crucial to fisheries production, its maintenance and sustainability. It is on this premise that the assumption that artisanal fisher accessibility to relevant and needed fisheries information will not only enhance fishery production but also enhance its sustainability, particularly in coastal areas of the southwest and Nigeria at large. The main objective was to determine artisanal fishers' accessibility to fishery information in coastal areas of southwest, Nigeria. The specific objectives were to ascertain artisanal fishers' socio-economic characteristics in the study area determine the types of fish caught and their mode of sale; ascertain sources of fisheries information that have met their needs; and investigate artisanal fishers' access to fishery information. Based on the drawn up objectives, these null hypotheses were tested:  $H_{01}$ :

Artisanal fishers' socio-economic characteristics are not significantly related to their accessibility to information needs  $H_{02}$ : There is no significant relationship between artisanal fisher's sources of information and accessibility to fishery information and  $H_{03}$ : There is no

significant difference in the artisanal fishers' accessibility to fisheries information across coastal areas in South-West Nigeria.

### Materials and Methods

A multiple stage sampling procedure was used for selecting respondents for this study. This study was conducted in the coastal areas of southwest Nigeria, with Lagos, Ogun and Ondo states purposively selected due to the fact that these three states are the coastal states in southwest Nigeria. In the second stage, purposive sampling was used in selecting one (1) Local Government Area (LGA) namely; Ibeju-Lekki LGA from Lagos State, Ogun waterside LGA from Ogun State and Ilaje LGA from Ondo State because they are all located along the same coastline as indicated in Figure 1.



**Figure 1:** Map showing coastal areas of southwest, Nigeria

**Source:** Oose, 2016

From the three LGAs, 50% of the fishing communities in each of the LGAs were randomly selected giving a total of nineteen (19) fishing communities that

were selected. Using Watson (2001) sampling technique at confidential interval of 95% with an estimated 50% variance in population (that is degree of variability) sixty-five artisanal fishers were selected from Ibeju-Lekki, 114 from Ogun Waterside and 35 artisanal fishers from Ilaje making a total 214 artisanal fishers that were selected across the fishing communities. A structured interview schedule was used to elicit response from the artisanal fishers after it was content and face validated. Accessibility to fisheries information was ascertained using a 3 – point rating scale of very often = 3, sometimes = 2 and not at all = 1. Data were analysed using descriptive statistics such as frequency count, percentages, mean and standard deviation and inferential statistics such as logistic regression model, chi square, and Analysis of Variance (ANOVA).

### Results and Discussion

#### *Socio-economic characteristics of the respondents*

Results in Table 1 show that the mean age of the artisanal fishers was 43.59 with 38.3% within the ages of 30 and 40 years while 28.0% were between 41 years and above. This observation implied that most of the artisanal fishers are physically active because only agile male fishers can withstand the rigor of coastal fishing. This finding was similar to an earlier observation by Oose *et al.* (2015) who reported that active male artisanal fishers were mostly below the age of 50 years. The mean household size was 8.36 with 35.5%

of the respondents having between 5 and 6 persons in their household. The large household size of artisanal fishers may be adduced to the fact that artisanal fishing involved processing and marketing which is primarily carried out by artisanal fishers' wives and children. Table I further indicates that 81.3% of the respondents had spent 6 years in formal schooling while 37.4% had between 11 and 20 years of fishing experience. This finding implies

that the respondents had substantial fishing experience. Furthermore, the table also shows that the artisanal fishers' mean years of stay in the fishing community was 39.12, with 72.9% of the respondents having stayed for the past 31 years and above. Also, these respondents made an average of 11 fishing trips per week. This might be due to their use of outboard engines in their fishing activities.

**Table 1: Socio-economic characteristic of respondents (n=214)**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Age (Years)</b>				
= 20	27	12.6	43.59	9.90
21-30	45	21.0		
30-40	82	38.3		
41 and above	60	28.0		
<b>Household size (Persons)</b>				
= 2	21	9.8	8.36	3.29
3-4	48	22.4		
5-6	76	35.5		
6 and above	69	32.2		
<b>Years spent in school</b>				
= 6	174	81.3	6.50	2.67
7-12	31	14.5		
13 and above	9	4.2		
<b>Fishing experience (Years)</b>				
= 10	32	15.0	21.20	9.46
11-20	80	37.4		
21-30	65	30.4		
31 and above	37	17.5		
<b>Years of stay in community</b>				
= 10	9	4.2	39.12	14.13
11-20	21	19.8		
21-30	28	13.1		
31 and above	156	72.9		
<b>Fishing trip/week</b>				
= 7	37	17.3	11.49	4.57
8-14	127	59.3		
15-21	48	22.4		
22 and above	2	0.9		

Source: Field survey, 2015

### Types of fish caught and their mode of sale

Findings in Table 2 revealed that the major types of fish caught in the study locations were: *Sardinella maderensis* (sawa), *Ethmalosa fimbriata* (agbodo), *Pseudotolithus elongatus* (alapo), *Macquereau espagno*(kote) and *Arius heudeloti* (Kugbe). This finding was in consonance with that of Olaoye (2010) who reported that *Pseudotolithus elongatus* and *Macquereau espagno* are found in the coast. Also, as indicated in Table 3, the identified modes of sale of fish in the study locations were on; Kilogramme basis, by hand, on dozen basis and in bundles. It was observed that 200 pieces of fish was equivalent to one hand full while one big *Pseudotolithus elongatus* (*Alapo* or *Croker*) cut into 15 pieces was referred to as bundle. Findings show that hand measurement was the main mode of sale of fish used across the three states. It was also found out that sale of fish in kilogramme basis was used mainly in Lagos State.

### Sources of Fishery Information

Results in Table 4 show the sources through which artisanal fishers in the study area obtained information. Findings revealed that majority (98.6%) of the respondents indicated indigenous knowledge as a source of information. The irregular visits by extension agents could be adduced to why the artisanal fishers preferred indigenous knowledge and fellow farmers as their main sources of information. Furthermore, the reason for the respondents depending largely on indigenous knowledge as their major source of information could be due to the lack of good road networks for the village extension agents to ply. It was observed that Ogun and Ondo States do not have reliable road networks to these communities. Also, the fishers over the years, have been able to predict the movement of the sea and determine when not to go for fishing using their indigenous knowledge.

**Table 2: Types of fish caught in the study area**

	Scientific Names	Local Names	Study area		
			Lagos State	Ondo State	Ogun State
1.	<i>Sardinella maderensis</i>	Sawa, Efolo			
2.	<i>Ethmalosa fimbriata</i>	Agbodo			
3.	<i>Pseudotolithus elongatus</i>	Alapo			
4.	<i>Macquereau espagnol</i>	Kote			
5.	<i>Arius heudeloti</i>	Kugbe			
6	<i>Ilisha africana</i>	Palamu			

Note: Shaded cells indicate where fish are harvested;  
Source: Field survey, 2015

**Table 3: Mode of Sale of fish in the study area**

Scientific Name	Local Name	Study Area								
		Lagos State		Ondo State			Ogun State			
		Kilo (Kg)	Hand	Hand	Dozen	Bundle	Kilo (Kg)	Hand	Dozen	Bundle
<i>Sardinella maderensis</i>	Sawa									
<i>Ethmalosa fimbriata</i>	Agbolo									
<i>Pseudotolithus elongatus</i>	Alapo									
<i>Macquereau espagnol</i>	Kote									
<i>Arius heudeloti</i>	Kugbe									
<i>Ilisha africana</i>	Palamu									

Note: Shaded cells indicate the mode of sale used;

**Sale:**

- Scaling on Kg basis
- By hand measurement
- On dozen basis
- In bundles

Source: Computed from field survey (2015)

**Table 4: Sources of information (n = 214)**

S/N	Sources of information	Frequency	Percentage
1.	Indigenous knowledge	211	98.6
2.	Friends/relatives	208	97.2
3.	Radio broadcast	197	93.0
4.	Television broadcast	38	17.8
5.	Extension agents	168	78.5
6.	Newspapers, Bulletins, Magazines	89	41.6
7.	Cinema	4	1.9
8.	E-mails	2	0.9
9.	Internet	10	4.7
10.	Fellow artisanal fishers	200	93.5
11.	Conferences/Seminars/Workshops	124	58.0
12.	Publications and journals	9	4.2
13.	Audio and Video Cassettes	131	61.2
14.	Meeting days	207	96.8
15.	Field days	208	97.2

Source: Field Survey, 2015

Majority (97.2%) of the respondents indicated friends/relatives and field days as their sources of information. Also, majority (93.5% and 93.0%) of the respondents indicated Fellow artisanal fishers and radio programmes as additional sources of information respectively. These findings are in consonance with that of Ajayi (2005) who found the use of radio as the major source of information in Southwest Nigeria.

### Access to Fishery information

Table 5 revealed artisanal fishers accessibility to fishery information. Findings revealed that respondents had access to information on appropriate mesh

size ( $\bar{x} = 1.89$ ), use of scale ( $\bar{x} = 1.84$ ), fishing gear weight ( $\bar{x} = 1.73$ ), fish gear float ( $\bar{x} = 1.70$ ), fishing craft haulage ( $\bar{x} = 1.70$ ), method of boat storage ( $\bar{x} = 1.63$ ) and fishing gear ( $\bar{x} = 1.63$ ). Findings further revealed that information on outboard engine safety ( $\bar{x} = 1.16$ ), outboard engine maintenance ( $\bar{x} = 1.16$ ) and fishing injuries preventions ( $\bar{x} = 1.23$ ) were not readily accessible to the respondents. This finding was in consonance with the findings of Agbamu (2005) who had earlier reported that the low ratio of extension agents to farmers in Nigeria coupled with poor road networks in the coastal communities explained why artisanal fishers had low accessibility to fishery information.

**Table 5: Artisanal Fishers' Accessibility to Information (n=214)**

S/N	Variable	VO	ST	NA	Mean	SD	Rank
1	Appropriate mesh size	18(8.4)	164(76.6)	32(15.0)	1.86	0.40	1 <sup>st</sup>
2	Use of scale	11(5.1)	171(79.9)	32(15.0)	1.84	0.36	2 <sup>nd</sup>
3	Fishing Gear weight (sinkers)	13(6.1)	123(57.5)	78(36.4)	1.73	0.48	3 <sup>rd</sup>
4	Fishings gear float	10(4.7)	142(66.4)	62(29.0)	1.70	0.46	4 <sup>th</sup>
5	Fishing craft haulage	5(2.3)	146(68.2)	63(29.4)	1.70	0.46	4 <sup>th</sup>
6	Method of boat storage	7(3.3)	130(60.7)	77(36.0)	1.63	0.48	6 <sup>th</sup>
7	Fishing gear	4(1.9)	132(61.7)	78(36.4)	1.63	0.48	6 <sup>th</sup>
8	Protection of fish gears	12(5.6)	54(25.2)	148(69.1)	1.61	0.48	8 <sup>th</sup>
9	Hanging ratio	14(6.5)	120(56.1)	86(37.4)	1.60	0.49	9 <sup>th</sup>
10	Fishing storage	14(6.5)	116(54.2)	84(39.3)	1.56	0.50	10 <sup>th</sup>
11	Techniques used in mariculture	19(8.9)	138(64.5)	57(26.1)	1.37	0.48	11 <sup>th</sup>
12	Weather forecast	9(4.2)	68(31.8)	137(64.0)	1.33	0.47	12 <sup>th</sup>
13	Price standardisation	7(3.3)	58(27.1)	149(69.8)	1.29	0.46	13 <sup>th</sup>
14	Fish preservation	4(1.9)	59(27.6)	151(70.6)	1.28	0.45	14 <sup>th</sup>
15	Fish drying	13(6.1)	55(25.7)	146(68.2)	1.28	0.46	14 <sup>th</sup>
16	Fishing gear safety	4(1.9)	57(16.6)	153(71.5)	1.27	0.44	16 <sup>th</sup>
17	Modernised smoking	9(4.3)	54(25.2)	151(70.6)	1.27	0.45	16 <sup>th</sup>
18	Fishing injuries prevention	13(6.1)	47(22.0)	154(72.0)	1.23	0.42	18 <sup>th</sup>
19	Outboard engine maintenance	2(1.0)	33(15.4)	179(83.6)	1.16	0.38	19 <sup>th</sup>
20	Outboard engine safety	1(0.5)	35(16.4)	179(83.2)	1.16	3.71	19 <sup>th</sup>

Source: Field Survey, 2015;

Key: VO=Very often, ST=Sometimes, NA=Not at all

***Overall level of artisanal fishers' accessibility to information***

Table 6 shows the categorisation of the overall level of artisanal fishers' accessibility to information. The categorisation of artisanal fishers ranged from 20-60. Artisanal fishers' accessibility was categorised into two thus: 20-40 (low access to information) and 41-60 (high access to information). Majority (71.1%) of the respondents had low access to fishery information while only few (29.0%) had high access. This result shows that the level of information dissemination by extension agencies to artisanal fishers in the study area was low, which could be as a result of low ratio of extension agents to fishers and poor road networks.

***Determinants of artisanal fishers' accessibility to fishery information***

Factors that influence the artisanal fishers' accessibility to fishery information were examined using the binary logistic regression model. As indicated in Table 7, the likelihood estimates of the Logit model

indicates that the Chi-square statistic of 131.09 was highly significant ( $p < 0.0000$ ) suggesting that the model has a strong explanatory power. The pseudo-coefficient of multiple determinations ( $R^2$ ) shows that 67 percent of the variation in respondents decision in their accessibility to information in the study area was collectively explained by the independent variables. The age of the fishers, years spent in school, years spent in the fishing community and number of fishing trips covered in a week all had a positive significant coefficient at  $p < 0.01$ , on their accessibility to fishery information. This observation suggests that the difference in the fishers' age, fishing experience and the number of years spent in school were variables that influenced their access to fishery information. These findings follow similar trend with that of Levy and Banergee (2008) that the years of fishing experience and illiteracy level of artisanal fishers over the years had affected their access to relevant information.

**Table 6: Overall level of artisanal fishers' accessibility to information**

<b>Variable</b>	<b>Categorization</b>	<b>Frequency</b>	<b>Percentage</b>
Low access to information	20-40	152	71.0
High access to information	41-60	62	29.0

Source: Computed from field data, 2015

**Table 7: Determinants of artisanal fishers’ accessibility to fishery information**

Variables	Coefficient	Standard Error	P> z	Marginal effect
Age	0.122***	0.038	0.001	0.885
House hold size	0.049	0.084	0.560	0.952
Years spent in school	0.195**	0.078	0.012	1.215
Fishery experience	0.004	0.003	0.173	-1.326
Years spent in community	0.80***	0.029	0.006	0.923
Fishing trip/week	0.165***	0.058	0.005	1.179
Constant	1.811	1.770	0.306	
Number	214			
LRChi <sup>2</sup>	131.09			
Prob>Chi <sup>2</sup>	0.000			
Log-Likelihood	54.95			
Pseudo R-Square	0.67			

Note: \*\*\*= (P<0.01) Significant at 1 percent, \*\*= (p<0.05) Significant at 5 percent  
 Source: Field survey, 2014

**Table 8: Relationship between sources of information and access to fishery information**

Variable	Chi square	P-value	Decision
Sources of information and accessibility to information	27.88	0.001	S

Source: Field survey, 2014

**Relationship between sources of information and access to fishery information**

According to Table 8, there is a significant relationship between the sources of information that artisanal fishers were exposed to and their accessibility to fishery information ( $\chi^2 = 27.88$ ;  $p < 0.01$ ). This observation is expected because the sources of information would certainly affect the types of fishery information reaching the respondents.

**Test of significant difference of artisanal fishers’ accessibility to fishery information across the study locations**

The result of this hypothesis “There is no significant difference in artisanal fishers’ accessibility to fishery information across the study locations” was tested using one-

way Analysis of Variance (ANOVA) and results are presented in Tables 9, 10 and 11. Findings in Table 9 revealed that there was a significant difference in the artisanal fishers’ access to fishery information across the three coastal states in southwestern, Nigeria ( $F = 20.57$ ;  $p < 0.05$ ). This implies that artisanal fishers’ low access to fishery information varies across the locations. As indicated in Table 10, there is a significant difference in respondents’ access to information when comparing Lagos with Ondo ( $p = 0.001$ ) and Ogun states ( $p = 0.001$ ) respectively.

Furthermore, a post-hoc multiple comparisons was carried out to indicate the significant differences among the study locations with respect to their access to fishery information (using the Least Significant Difference LSD method).

Table 11 shows that fishery information was mostly accessed ( $x = 33.20$ ) by artisanal fishers in Lagos when compared with their counterparts in Ogun and Ondo

states. The reasons adduced to this might be because of good road networks in Lagos state coastal communities and its nearness to urban centres.

**Table 9: Test of difference in information needs of artisanal fishers across the study locations**

Sources of Variation	Sum of Square	Df	Mean Square	F-Valve	P-Value	Decision
Between Group	1373.844	2	686.922	20.57	0.001	S
Within Group	6977.133	212	33.38			
Total	8350.958	214				

Source: Computed from field survey (2014)

**Table 10 Post-Hoc (LSD) multiple comparison of variables**

Variable	State (I)	State (J)	Mean Difference (I-J)	Std. Error	Sig.	Decision
Access to information	Ondo	Ogun State	1.481	0.994	0.138	NS
		Lagos State	-4.405*	1.066	0.001	S
Access to information	Ogun State	Ondo State	-1.481	0.94	0.138	NS
		Lagos State	-5.885*	0.935	0.001	S
Access to information	Lagos State	Ondo State	4.405*	1.066	0.001	S
		Ogun State	5.885*	0.930	0.001	S

Source: Computed from field survey (2014), \*The mean difference is significant at the 0.05 level

**Table 11: Post-Hoc (LSD) showing the mean values**

	N	Mean	Standard deviation
Lagos State	66	33.20	2.748
Ondo state	53	28.29	2.279
Ogun state	93	27.31	2.692

Source: Computed from field survey (2014)

### Conclusion and Recommendations

The study revealed that the mean age of artisanal fishers involved in coastal fishing was 43 years. Also, main sources of information to the fishers are indigenous knowledge, field days, friends/family and meeting days. Furthermore, artisanal fishers were mostly accessible to the following fishery information: appropriate mesh size, use of scale, fishing gear weight, fish gear float, fishing craft haulage and method of boat storage. Age of the fishers, years spent in school, years spent in the community and fishing trip covered in a week were the major determinants of artisanal fishers accessibility to fisheries information. A positive relationship was observed between the sources of information and accessibility by fishers. However, a significant difference existed in the artisanal fishers' access to fisheries information across the study locations. It was therefore recommended that good road network be put in place in the fishing communities and extension messages packaged in form of mobile phone short message services for dissemination to the fishers in their local languages.

### References

- Agbamu, J. U. (2005). Agricultural Extension Linkage System. An International Perspective. Agren Network Paper. 106p.
- Ajayi, M.T. (2005). Analysis of Mass Media use for Agricultural information by farmers in Egbeda Local Government of Oyo State, Nigeria. *Journal of Extension Systems*. 79(2), 45-55
- Banmeke, T. O. A and Olowu, T. A. (2005). Agricultural Information Needs of Women Farmers in South-West Nigeria: Lessons for Effective Extension Delivery, *Journal of Agricultural Extension*, 8:32-40.
- Buckland, M., (1991). Information as thing. *Journal of American Society for Information Science*, 42(5): 51-60.
- Daddy, F and Falaye, A. E. (2004). Potentials for Sustainable Flood Plan Fisheries Development: A Case Study of Tafabu Flood Plan. A Paper Presented at the 19th Conference of the Fisheries Society Association of Nigeria, FISON. Lagos
- Devadason, F. J. and Lingam, P. P. (1997). A Methodology for the Identification of Information needs of users. *IFLA Journal*, 23(1): 41-51.
- Faturoti, O. (2010). *Nigeria: Fisheries Contribution*. \$US1 Billion to Economy. 25<sup>th</sup> Annual Conference Fisheries Society of Nigeria, Badagry, Lagos, Nigeria
- Federal Department of Fisheries FDF, (2011). *Fisheries Statistics of Nigeria*, 2001 – 2010, 8<sup>th</sup> Edition. 54
- Food and Agriculture Organization (2003). Participatory Communication: A key to Rural Learning System. Food and Agriculture Organization of the United Nations, Rome. P. 1-40
- Jamaica Documentary (2005). Information on Fisheries Management in Jamaica. Jamaica – Information and Communication Technology (ICT) (6):134.
- Levy, M. R., and Banerjee, I. (2008). Urban Entrepreneurs, ICTs,

- and Emerging Theories. A new Direction for Development Communication. *Asian Journal of Communication* 18(4): 304-317.
- Nicholas, D. (2000). *Assessing Information Needs: Tools, Techniques and Concepts for the Internet Age*. Second Edition: London: Aslib.
- Olaoye. O. J. (2010). *Dynamics of the Adoption Process of Improved Fisheries Technologies in Lagos and Ogun State*. PhD Thesis. Aquaculture and Fisheries Management. University of Agriculture Abeokuta 353pp
- Oose, M. O., Banmeke, T. O. A., Olaoye, O. J and Otufale G. A. (2015). Fisheries Information Needs of Artisanal Fishers in Coastal Communities of South-West Nigeria: Implication for Effective Fisheries Information Dissemination. *International Journal of Agricultural Economics and Rural Development*. 7(1), 44-51
- Oose. M. O. (2016). *Acceptability of Short Message Services for Agricultural Information Dissemination among Artisanal Fishers in Coastal Areas of South-West, Nigeria*. PhD Thesis. Agricultural Extension and Rural Development. Federal University of Agriculture Abeokuta 327pp.
- Watson, J. (2001). How to Determine a Sample Size: Tip sheet #60, University Part PA. Penn State Cooperative Extension. Available at: <http://www.extension.psu.edu/evaluation/pdf/Ts60.pdf>
- World Fish Centre, (2005). *Fish and Food Security in Africa*. World Fish Centre Penang, Malaysia.