Artisanal Fishermen's Utilization of Mobile Phone Applications in Coastal Fishing Communities of Southwest Nigeria

*Oose, M. O. [1] **, Banmeke T. O. A.** [1] **and Olaoye O. J.** [2]

[1]Department of Agricultural Extension and Rural Development,
Federal University of Agriculture, Abeokuta, Nigeria,
[2]Agricultural Media Resources and Extension Centre (AMREC),
Federal University of Agriculture, Abeokuta, Nigeria.
Corresponding Author E-mail: oosematthew@gmail.com

Abstract

The invention and use of mobile phones has revolutionized and transformed the communication process in a way and manner that information can be readily accessed, shared or stored. This study assessed artisanal fishermen's utilization of mobile phone applications in coastal fishing communities of southwest, Nigeria. Multistage sampling procedure was used to select 214 artisanal fishermen for the study. Primary data were obtained using a structured interview guide and analyzed using frequency count, percentages, mean, standard deviation, chi-square test, Pearson Product Moment Correlation and Analysis of Variance. Results indicate that the mean age of the respondents was 43 years, 86.9% were married and the mean household size was 8 persons. Findings further show that the mean years of fishing experience was 21 years and 51.9% had primary education. Majority (99.1% and 95.8%) of the respondents indicated the availability of MTN and Globacom network services, respectively. Most utilized mobile phone applications were; voice calls ($\bar{x}$ =3.97), SMS ($\bar{x}$ =3.83), calculator ($\bar{x}$ =3.78) and radio ($\bar{x}$=3.78). There were significant associations (P < 0.05) between artisanal fishermen's marital status (χ^2 =271.37, df = 2), educational status (χ^2 =129.92, df = 3) and utilization of mobile phone applications. There was a significant difference (F = 40.80, p < 0.05) in the utilization of mobile phone applications across the study locations. It was concluded that voice calls and SMS were the mobile phone applications predominantly used by the artisanal fishers. Based on this, it was recommended that voice calls and SMS on mobile phones should be used to reach artisanal fishermen with development and enterprise information.

Keywords: Artisanal fishermen, Mobile phones, Information, Mobile phone applications.

Introduction

The world's population predicted to rise to about 9 billion by 2050 (Qiang, *et al.*, 2012). Therefore, the task of feeding this teeming population calls for urgent attention. One of the major reasons many countries particularly in sub-Sahara Africa experience food insecurity is as a result of the low ratio of traditional public extension agents to farmers. This low ratio is evident in developing countries like Indonesia, 1: 200, Mexico, 1: 800, Thailand, 1:1000, Tanzania, 1:1000 and India 1:2000 (Saravanan, 2014, Agbamu,

2005). This makes it very expensive to reach farmers with relevant information.

In an attempt to salvage these daunting challenges, the integration of Information and Communication Technologies (ICTs) is vital. Technology in the present world is of great importance and we cannot underestimate its relevance in agricultural production. Information and Communication Technology is being used for development purpose because of their mass reach. Omotayo (2005) conceptualized ICTs as information communication technologies built on the means of electronic communication

such as computers, for assessing and accessing various ends in information pathways. In the same vein, Technical Centre for Agriculture and Rural Cooperation (CTA) (2003) defined ICT as technologies that facilitate communication processing and transmission of information by electronic means.

The concept of ICT encompasses other simple communication devices such as radio, television, video tapes, audio compact disc and mobile phones. Mobile phones have long been utilized for development communication and it constituted part of the revolution brought to the transfer and dissemination of information (Banmeke and Oose, 2012). Mobile phones are new emerging devices with potentials to create, store, access and support development in developing countries. According to Saravanan (2014), the number of mobile phone subscription (6.8 billion) is almost equivalent to the global population (7.1 billion). Mobile phones have the potential of taking famers above the poverty line and provide a sustainable livelihood to the rural dwellers (Saravanan, 2014).

Mobile phone has been so widespread in Nigeria. In view of this rapid spread of mobile phones, its offers lots of advantages for poor artisanal fishermen in coastal communities of south-western. Furthermore, Marcel and Bart (2011) reiterated that mobile phones are increasingly used in rural areas in Africa to disseminate daily price of agricultural commodities. Also, other inherent benefits of mobile phone as espoused by Marcel and Burt (2011), Rashid and Elder (2009), The Economist (2008), Lehr (2007), Donner (2006), include: mobility and security to owners; they do not rely on physical infrastructure such as roads, phone wires and base stations and they only require basic literacy and therefore are accessible to a large portion of the population. Furthermore, the introduction and integration of mobile phone in information delivery may reduce the pressure on extension agents and improve farmers' productivity and their access to relevant information. It is therefore pertinent that artisanal fishermen are adequately equipped in order to utilize mobile phone applications such as Short Message Services (SMS), voice recorders, calculator and many others.

Sequel to the foregoing, this study determined the artisanal fishermen's utilization of mobile phone applications in coastal fishing communities of southwest, Nigeria. The specific objectives of the study were to;
1. ascertain the socio-economic characteristics of artisanal fishermen in the study area,
2. identify the availability of network services in the study area,
3. determine respondents' awareness of mobile phone applications in the study area, and;
4. determine respondents' utilization of mobile phone applications.

Hypotheses of the study

Ho_1: There is no significant association between artisanal fishermen socio-economic characteristics and their utilization of mobile phone applications

Ho_2: There is no significant relationship between artisanal fishermen's awareness and utilization of mobile phone applications

Ho_3: There is no significant difference in the artisanal fishermen's utilization of mobile phone applications across coastal fishing communities in southwest Nigeria.

Materials and Methods

The study was carried out in coastal Southwest Nigeria which comprises Lagos, Ogun and Ondo States. Southwest coastal area has a marine shoreline of about 250 km and extends inland about 32 km (at its farther points) from

the shoreline and 200 km eastwards from the Nigeria/Benin Republic border. Average minimum temperature ranges from $10° - 25°$ C with maximum of $27° - 37°$C and the relative humidity is about 60% throughout the year (Dublin-Green *et al.*, 1997). Temperature in the coastal area is moderated by clouds and damp air (Kuruki, 2004).

A multi-stage sampling procedure was used for selecting respondents for this study. In the first stage, purposive sampling was used in selecting all the three (3) coastal states. In the second stage, 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 were purposively selected based on the fact that these LGAs were the prominent ones within the coastal axis from each of the state.

The third stage in the sampling procedure involved the selection of fishing communities. Simple random sampling procedure was used to select 50 percent of the fishing communities, therefore six (6) fishing community namely Magbon Alade, Orimedu, Akodo, Lekki, Otolu and Folu, were selected from the 13 fishing communities in Ibeju Lekki, 8 from the 16 fishing communities in Ogun waterside namely; Igeki, Ileti, Olosumeta, Igbosere, Bolurunduro, Elefon, J Camp, Aba Gold and 4 from the 9 fishing communities in Ilaje namely; Araromi, Ago Benin-boye, Enu amo and Holy centre. A total of Nineteen fishing communities were selected for this study. The fourth stage involved the selection of the respondents. Watson (2001) sampling procedure, at confidence level of 95% was used to select fifty percent (50%) of the

artisanal fishers randomly in each of the fishing communities. Thus, a total number of 214 artisanal fishermen were selected for the study. Utilization of mobile phone applications was measured using a 4-points rating scale of regularly (4), occasionally (3), rarely (2) and never (1). The categorization of artisanal utilization of mobile phone application ranged from 1-68, artisanal fishermen's utilization was categorized in two thus; 1-34 (low utilization of mobile phone application) and 35-68 (High utilization of mobile phone application). The data obtained were subjected to descriptive (frequency distribution, percentages, mean and standard deviation) and inferential (Chi-square, Pearson Product Moment Correlation (PPMC) and Analysis of Variance) statistics.

Results

Socioeconomics characteristics of respondents

Table 1 shows the socioeconomic characteristics of the respondents. The mean age of the respondents was 43±9.90 years. More than one-third (35.5%) of the respondents had household size of between 5 and 6 persons while 32.2% had a household size of 7 persons and above. Meanwhile, close examination of the artisanal fishers showed that the higher number of persons that constitutes their household was a result of polygamous family. Also, many (86.9%) of the respondents were married while 51.9% had primary school education. The mean years of fishing experience and fishing trip/week were 21 years and 11 trips, respectively.

Table 1: Distribution of respondents by their socio-economic characteristics (n = 214)

Variables	Frequency	Percentage	Mean value	Standard deviation
Age (Years)				
= 20	27	12.6	43.59	9.90
21-30	45	21.0		
30-40	82	38.3		
41 and above	60	28.0		
Household size				
= 2	21	9.8	8.36	3.29
3-4	48	22.4		
5-6	76	35.5		
7 and above	69	32.2		
Educational level				
No formal education	33	15.4		
Vocational education	02	0.9		
Primary education	111	51.9		
Secondary education	59	28.0		
Tertiary education	09	4.2		
Marital Status				
Single	9	4.2		
Married	186	86.9		
Widowed	13	6.1		
Separated	6	2.8		
Fishing experience (Years)				
= 10	32	15.0	21.20	9.46
11-20	80	37.4		
21-30	65	30.4		
31 and above	37	17.5		
Fishing trip/week				
= 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, 2016

Availability of mobile network services
The result in Table 2 shows the availability of mobile network services in the study area. The network services considered were MTN, Visafone, Globacom, Etisalat and Zain. Finding reveals that majority (99.1%) of the respondents indicated that MTN network services were available, while 95.8% and 81.8% of the fishermen indicated the availability of Globacom and Visafone network services, respectively.

Table 2: Distribution of network Services (n = 214)

Network Services	Frequency	Percentage
MTN	212*	99.1
Visafone	175	81.8
Globacom	205	95.8
Etisalat	167	78.0
Airtel	147	68.7

Source: Field Survey, 2014;
*Multiple responses is applicable

Awareness of Mobile Phone Applications

Information on artisanal fishermen' awareness of mobile phone applications presented in Table 3 indicates that 92.1% and 91.6% of the respondents were aware of voice calls and radio respectively, 90.7% were aware of camera and 89.7% were aware of SMS. This indicates that most of the respondents in the study area are quite aware of these mobile phone applications. This observation is expected as most of them had basic primary education and also own a mobile phone.

Table 3: Distribution of respondents by mobile phone applications (n = 214)

Mobile Phone App	*Frequency	Percentage
Calculator	189	88.3
Voice Recorder	178	83.2
Stop Watch	161	75.7
WhatsApp	27	12.6
2go	22	10.3
Picture Camera	194	90.7
Video Camera	187	87.4
Opera mini	9	4.2
Memo Pad	12	5.6
Files	23	10.7
Voice Calls	197	92.1
SMS	192	89.7
MMS	26	12.1
Clock/Alarm	178	83.7
Games	183	85.5
Radio	196	91.6

Source: Field Survey, 2014;
*Multiple responses is applicable

Utilization of Mobile Phone Application

Results in Table 4 indicate that the major mobile phone applications utilized by the respondents were voice call ($\bar{x}$ =3.97), SMS ($\bar{x}$ =3.83), radio ($\bar{x}$ =3.78), calculator ($\bar{x}$ =3.78) and picture camera ($\bar{x}$ =3.54). This indicates that these were the most commonly used mobile phone applications among the artisanal fishermen in the study area.

Table 4: Utilization of mobile phone application (n = 214)

Mobile Phone Apps	Regular	Occasionally	Rarely	Never	Mean Utilization	SD	Rank
Calculator	188 (87.8)	19 (8.9)	5 (2.3)	2 (0.9)	3.78	0.50	3rd
Voice Recorder	94 (43.9)	84 (39.2)	10 (4.7)	26 (12.1)	3.16	0.99	13th
Stop Watch	7 (3.3)	121 (56.5)	61 (28.5)	25 (11.7)	2.48	1.75	12th
WhatsApp	4 (1.9)	19 (8.9)	132 (61.7)	59 (27.6)	2.48	0.67	9th
2go	14 (6.6)	22 (10.3)	116 (54.2)	62 (29.0)	2.29	0.63	11th
Picture Camera	152 (71.8)	40 (18.7)	14 (6.5)	8 (3.7)	3.54	0.79	5th
Video Camera	40 (18.7)	146 (68.2)	18 (8.4)	10 (4.7)	3.32	0.69	7th
Opera mini	2 (0.9)	10 (4.7)	136 (63.5)	66 (30.8)	1.73	0.80	14th
Memo Pad	1 (0.5)	1 (0.5)	88 (41.1)	124(58.0)	1.48	0.54	17th
Files	10 (4.7)	13 (6.1)	93 (43.5)	98 (48.8)	1.78	0.72	15th
Voice Calls	167 (78.0)	14 (6.5)	8 (3.7)	25 (11.7)	3.97	0.70	1st
SMS	92 (43.0)	105 (49.1)	5 (2.3)	12 (5.6)	3.83	0.77	2nd
MMS	17 (7.9)	12 (5.6)	55 (25.7)	130 60.7)	1.67	0.63	16th
Clock/Alarm	155 (72.4)	30 (14.0)	15 (7.0)	14 (6.5)	3.47	0.91	6th
Games	22 (10.3)	129 (60.2)	55 (25.7)	8 (3.7)	3.26	0.70	8th
Radio	35 (16.3)	147 (68.7)	28 (13.1)	4 (1.9)	3.78	0.57	3rd

Source: Field Survey, 2014; Figures in parenthesis are percentages; SD = Standard deviation

Level of mobile phone applications

Table 5 shows the categorization of artisanal fishermen utilization of mobile phone application for information. More (62.6%) of the artisanal fishermen indicate high level of use of mobile phone applications, while only 37.4% had low utilization of mobile phone applications.

Table 5: Distribution of respondents by level of mobile phone applications

Variable	Categorization	Frequency	Percentage
Low utilization of mobile phone apps	1 – 34	80	37.4
High utilization of mobile phone apps	35 – 68	134	62.6

Source: Field survey data, 2014

Test of association between socio-economic characteristics and utilization of mobile phone applications

Result presented in Table 6 shows that there were significant associations (P<0.05) between artisanal fishermen' marital status (χ^2=271.37, df =2), educational status (χ^2=129.92, df=3) and utilization of mobile phone applications. Furthermore, results of the correlation analysis shows there were positive and significant correlation (P<0.05) between artisanal fishers' age (r=0.206) and their utilization of mobile phone applications.

Table 6: Test of relationship between socioeconomic characteristics and utilization of mobile applications

Variables	Chi square	Contingency coefficients	df	p-values	Decision
Marital status	271.37	0.749	2	0.01	Significant
Education status	129.92	0.635	3	0.03	Significant
Religion	65.20	0.484	2	0.36	Not Significant

Variables	r – values	p-values	Decision		
Age	0.206	0.01	Significant		
Household size	0.118	0.36	Not Significant		
Fishing Experience	-0.59	0.63	Not Significant		
Fishing trip	0.03	0.80	Not Significant		
Income	0.197	0.12	Not significant		

Source: Field survey, 2015; r = correlation value; p-value is significant at the 0.05 probability level

Test of relationship between awareness and utilization of mobile phone application
Result of the correlation analysis as presented in Table 7 shows that there was a positive and significant relationship ($P<0.01$) between awareness and utilization of mobile phone applications.

Table 7: Test of correlation between awareness and utilization of mobile phone applications

Variable	r	p-value	Decision
Relationship between awareness and utilization of mobile phone apps	0.38**	0.001	Significant

Source: Field survey data, 2014
** Correlation is significant at 0.01 levels

Test of difference in the utilization of mobile phone application across study location
The result of the analysis of variance is presented in Table 8. Findings indicate that there was a significant difference in the utilization of mobile phone applications across the study locations. (F=40.80, P < 0.05). This observation shows that artisanal fishermen' utilization of mobile phone applications varies across the locations. Furthermore, a post-hoc multiple comparisons were carried out to indicate the significant differences among the study locations with respect to respondents' utilization of mobile applications. (using the Least Significant Difference (LSD) method) and result presented in Table 9.

Table 8: Test of difference in the utilization of mobile phone applications across the study locations

Sources of Variation	Sum of Square	Df	Mean Square	F-Valve	P-Value	Decision
Between Group	7942.026	2	3971.013	40.80	0.001	Significant
Within Group	20340.441	212	97.323			
Total	28282.467	214				

Source: Computed from field survey (2014)

Table 9: Post-Hoc (LSD) multiple comparison of variables

	Location	Location	Mean Difference (1-J)	Std. Error	Sig.	Mean Value
Utilization of M. phone apps	Ondo	Ogun State	2.521	1.698	0.139	32.17
		Lagos State	14.645*	1.820	0.001	
Utilization of M. phone apps	Ogun State	Ondo State	-2.521	1.698	0.139	44.29
		Lagos State	12.12	1.588	0.001	
Utilization of M. phone apps	Lagos State	Ondo State	1.820	1.820	0.001	46.81
		Ogun State	-1.212	1.588	0.001	

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

Discussion

The need to incorporate mobile phones as a new extension tool cannot be overemphasized. Before the advent of mobile phone, artisanal fishers were extremely constrained to communicate with others while on the sea and they are usually cut off from all activities that affect their livelihood. This study assessed the artisanal fishers' utilization of mobile phone application. Their mean age was 43 years and this implies that coastal fishing is dominated by middle aged fishermen. This finding is similar to that of Oose (2015) that reported that the age range of fishermen in the coastal areas is between 41-50 years. It is the culture of the fishers to have a large household size as large as 8 people per household. They usually rely on fishing to cater for the family and that the usually possesses basic literacy education which invariably enables them to read and write and also help them utilize mobile application via mobile phone.

Furthermore, it was observed that the respondents across the three coastal states prefer to use Visafone when going for fishing on the sea. This was due to the fact that the network service coverage of Visafone was very active on the sea up to about 16 miles away from the landing sites. It implies that availability and active network services within the study area may encourage the fishermen to use mobile phone applications. Also, the most frequently used mobile phone applications were voice call, SMS and radio. This result corroborates the finding of Banmeke *et al.* (2010) about the utilization of mobile phone applications such as voice call and SMS which were considered suitable for information dissemination. There was a significant association between respondents' marital status, educational status, age and their utilization of mobile applications. This implies that artisanal fishermen' literacy level play a significant role in their utilization of mobile phone application. This disagrees with the findings with the earlier findings by Akegbejo-Samsons (2006) that artisanal fishers had little or no formal education. Also, the utilization of mobile application by the artisanal fishermen is influenced by their age. The young and middle age are likely to use mobile phone applications than the older fishermen.

Furthermore, there existed a correlation between respondents awareness and their

utilization of mobile phone applications. The finding is expected as awareness of an innovation often precedes the utilization. The result corroborates the assertion of Yates (1995) cited in Banmeke and Fapojuwo (2011) that for an innovation to be fully utilized the farmers need to be aware of such innovation. Also, mobile phone applications were used by the respondents across the three study locations. That is, Lagos, Ogun and Ondo States. By implication, it means that most of the artisanal fishermen utilized mobile phone applications and this might be due to their educational level. Also, the availability of network coverage within the locations influences fishermen's utilization of mobile phone application. Findings also indicate the utilization mean value respondents utilization of mobile phone applications in Lagos state (46.81), Ogun state (44.29) and Ondo state (32.17). It is therefore implies that respondents in Lagos state utilized mobile phone applications more when compare with their counterparts in Ogun and Ondo states.

Conclusion and recommendations
Based on the findings of this study, it could be concluded that there is generally high level of utilization of mobile phone applications and this will in turn enhance information dissemination. The high utilization of these mobile phone applications was basically influenced by respondents' level of education. It is therefore recommended voice calls and SMS on mobile phones should be used to reach artisanal fishermen with development and enterprise information.

Acknowledgements

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