

Use of Mobile Phones for Information Dissemination among Fish Marketers: Evidence from Kogi State, Nigeria

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Abstract

The study evaluated the use of mobile phones for information dissemination among fish marketers in Kogi State, Nigeria. The specific objectives are to identify the frequency of use of mobile phones for information dissemination among fish marketers, identify the relevance of mobile phones in fish marketing, determine the effect of selected socioeconomic variables on the use of mobile phone for fish marketing, and identify the constraints to the use of mobile phones for fish marketing. One hundred and twenty-five (125) fish marketers were selected from five (5) major markets in the State. These markets are: Anyigba, Itoke, Lokoja, Okene and Bagana. Data obtained were analysed using descriptive statistics, logit model and mean score from a Likert scale. Results showed that 78.4% of the marketers used mobile phones for fish marketing, while 21.6% of the marketers never used mobile phones for fish marketing. 59.2% and 19.2% of the marketers occasionally and frequently used mobile phones for fish marketing respectively. Annual income, marketing experience and cost of mobile phones significantly influence the likelihood of the use of mobile phones for fish marketing at 5% with cost of mobile phones been inversely related to the use of mobile phones. Fish marketers were constrained with low quality of services provided (M=4.44), inadequate extension contact (M=4.41), high level of illiteracy (M=4.31), inadequate capital (M=4.00), and inadequate electricity supply (M=3.93) in the use of mobile phones for fish marketing. The study recommended that government should enforce the installation of more GSM masts in rural areas with a view to improve the erratic and poor services experienced in rural communities. Also, there is need for further extension services to enlighten marketers on the relevance of mobile phones in fish marketing in order to increase the frequency of use of this technology for information dissemination.

Keywords: Information, Marketing, Mobile Phones, Relevance, Use.

1.0 INTRODUCTION

Marketing functions play vital roles in the marketing of fish. According to Adegeye and Dittoh, (1985), marketing functions are the activities performed by a marketing system in relation to the characteristics of agriculture which include seasonality, bulkiness, perishability, small quantities of production on small farms, non-consumable nature of some agricultural products in the raw farm. These functions include that of assembling the products from various production centres, processing the commodities in the form that will be suitable for consumption, and then making every arrangement to get them distributed to consumers. Marketing is vital to the growth of the economy and also plays a significant role in the demand for agricultural products (Baker, 1989; Ajani, 2005).

Generally, consumers need necessary information for the demand of these agricultural products. The absence this information system on food demand, supply and prices can lead to imperfect market as well as creating for the distributors the opportunity to exploit both farmers and consumers (Adekanye, 1988). Farmers and marketers need information in order to organize their products before moving them to the market where the demand and price is attractive. Such information can help them make decisions, identify outlets to minimize the risks related to commercial transactions, demand and market conditions (Eggleston *et al.*, 2002).

The use of mobile telephones among farmers and business men to source information on the location of products, price, and supply of products among others is on the increase. For instance, the use of global system of mobile communication (GSM) among fish marketers in many rural communities has drastically reduced the risks of travelling to places to look for fish, boost agricultural production as well as improving rural livelihood.

Mobile phones link fish marketers and wholesalers together for business (Scheen, 2008). GSM has helped fish marketers to acquire market information and intelligence to generate wealth and sustain their livelihood. It also has the potentials in bridging the information gap that exist between the urban and rural markets. In many countries across the world, mobile phone has provided employment opportunities and has also connected individuals to market and prospective buyers. The increasing availability of mobile phones network and handsets therefore present an opportunity to make useful information dissemination more widely. The introduction of mobile phones to fish marketers could decrease price dispersion and wastage by facilitating the spread of information which made the market more efficient by decreasing risk and uncertainty (Jensen, 2007 and Abraham, 2007).

It has been argued that increase in mobile phone penetration rates promotes economic growth and

national development (Waverman *et al.*, 2005). Bayes (2001) found higher returns of using mobile services for the poor compared to the non-poor. Analyzing the village phone service in Bangladesh, Bayes (2001) reported that the consumer surplus of the poor users, measured by taking into account factors of time saved, transport and opportunity costs, is 50% higher than that of the non-poor. The fast growth of mobile phones in Nigeria provides a better environment for its application in various sectors including agriculture and marketing. This study intends to fill the knowledge gap on the true position on mobile phone usage and its determinants among fish marketers in Kogi State, Nigeria.

The main objective of the study is to evaluate the use of mobile phone for information dissemination among fish marketers in Kogi State, Nigeria. Specifically, the study sought to:

1. ascertain the frequency of use of mobile phones for information dissemination among fish marketers in the area;
2. identify the relevance of mobile phones in fish marketing;
3. determine the influence of selected socioeconomic variables on the use of mobile phones among fish marketers; and
4. identify constraints to the use of mobile phones in information dissemination among fish marketers.

2.0 METHODOLOGY

The study area is Kogi State, Nigeria. Kogi State is located in the middle-belt north central of Nigeria. It extends from latitude 6°33' to 8°44' N and longitude 5°40' to 7°49' E. The state has a current population of about 3,278,487 people with an average of 172,000 farming families (FGN, 2006). The State has a tropical climate and one of the largest producers of maize in Nigeria (KADP, 2011). The climate is divisible into two major seasons-dry and wet seasons. The wet season begins towards the end of March and ends towards the end of October. In very dry year, rainfall may not start until the month of April. Dry season begins in the month of November and lasts until late February. The harmattan wind is experienced during the dry season for about two months (December and January). The average annual rainfall ranges from 850mm to 2000mm. During the rainy season the daily mean temperature is about 28°C while in the hot season, the average temperature is about 35°C. High humidity is also common (KADP, 2011).

Purposive sampling was used to select the sample size (respondents) for the study. Five major markets were purposively selected from the state. These include Anyigba, Itobe, Okene, Lokoja and Bagana markets. Twenty-five (25) fish marketers were randomly selected from each market. A total of 125 respondents were used for the study.

Primary data used were obtained from the respondents through questionnaire administration. The data were analysed using descriptive statistics such as frequency count, percentages and mean. Binary logit regression analysis and mean score analysis from a Likert scale were also used to analyse the data.

Model Specification

Logit Regression

The Binary Logistic Regression that was used is stated below:

$$Z = \text{Log}[p/1-p] = \text{Log} \\ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \mu$$

Where;

Z = probability of use of mobile phones in fish marketing. 1 = users and 0 if otherwise.

β = regression coefficient explaining changes caused in Z by changes in the dependent variable

X_1 = Age (in years) of the respondents

X_2 = Extension contact (number of visit per annum)

X_3 = Marital status (Dummy variable 1 for married, 0 for single)

X_4 = Income from fish marketing (in Naira)

X_5 = Marketing experience.

X_6 = Years spent schooling (in years)

X_7 = Cost of mobile phone (naira)

μ = Error term.

Mean Score Analysis

Constraint to the use of mobile phones in fish marketing was achieved with the use of mean score after respondents' responses were obtained using a Likert scale. Likert scale was developed by Rensis Likert in the 1930s to measure the mean scores of variables. The five point Likert scale was used as specified below:

Opinion	Point
Strongly Agreed (SA)	5
Agreed (A)	4
Undecided (U)	3
Disagreed (D)	2
Strongly Disagree (SD)	1

The mean response to each item was calculated using the following formula:

$$\bar{X} = \frac{\sum FX}{N}$$

Where:

- \bar{X} = means response,
- \sum = summation,
- F = number of respondents choosing a particular scale point,
- X = numerical value of the scale point, and
- N = total number of respondents to the item.

The mean response to each item was interpreted using the concept of real limits of numbers. The numerical value of the scale points (Response modes) and their respective real limits are as follows:

- Strongly Disagree (SD) = 1 point with real limits of 0.5 - 1.49
- Disagree (D) = 2 points with real limits of 1.50 - 2.49
- Undecided (U) = 3 points with real limits of 2.50 - 3.49
- Agree (A) = 4 points with real limits of 3.50 - 4.49
- Strongly Agree (SA) = 5 points with real limits of 4.50 - 5.49

Decision rule: constraint with mean score of 3.0 and above was considered as a serious constraint.

3.0 RESULTS AND DISCUSSION

3.1 Frequency of Use of Mobile Phones for Information Dissemination among Fish Marketers

The frequency of use of mobile phones for information distribution in fish marketing is presented in Table 1.

Table 1: Distribution of Respondents According to Frequency of Use of Mobile Phones for Information Dissemination in Fish Marketing

Use of Mobile Phones	Frequency	Percentage
Yes	98	78.4
No	27	21.6
Total	125	100.0
Frequency of Use		
Never Use	27	21.6
Occasionally (1-4 times)	74	59.2
Frequently (Above 4 times)	24	19.2
Total	125	100.0

Source: Field Survey, 2015

Results on the frequency of use of mobile phones in fish marketing presented in Table 1 shows that 98 (78.4%) of the sampled fish marketers in the study area used mobile phones for fish marketing while, 27 (21.6%) did not use. The results further indicate that 74 (59.2%) of the fish marketers occasionally used mobile phones for fish marketing. This implies that most marketers used mobile phones for fish marketing for an average of 1-4 times in a month. This could be seen that marketers used mobile phones especially on market days for fish marketing. This finding agrees with Stienen *et al.*, (2007). Only 19.2% of the respondents frequently used mobile phones for fish marketing.

Relevance of Mobile Phones in Fish Marketing

The relevance of mobile phones in fish marketing is presented in Table 2. Results in Table 2 shows that all (100%) the respondents agreed that mobile phones link fish marketers and wholesalers together. This is an indication that fish marketers who did not use mobile phones for fish marketing still recognized the vital role played by mobile phones in linking both the retailers and wholesalers. Fish marketers used mobile phones to discuss prices with wholesalers and crosscheck prices for their produce. Fish marketers also communicated a range of agricultural information, specifically on better prices, better management practices and weather information which together helped them to make better choices on where and when to buy or sell their fish. This finding is in agreement with Stienen *et al.*, (2007) who reported that ICTs create an awareness of up-to-date market information on prices of commodities and input. The finding also agrees with Aker (2011) who reported

that use of ICTs in agricultural extension services especially mobile phone services in the agricultural sector has provided information on market, weather, transport and agricultural techniques to contact with concerned agencies and departments.

Table 2: Distribution of Respondents According to Relevance of Mobile Phones in Fish Marketing

Relevance*	Frequency*	Percentage	Rank
i. Mobile phones link fish marketers and wholesalers together	125	100	1 st
ii. Mobile phones help in the acquisition of market information	122	97.6	3 rd
iii. Mobile phones help in bridging the information gap between rural and urban marketers	124	99.2	2 nd
iv. Mobile phones decrease price dispersion	111	88.8	9 th
v. Mobile phones make fish marketing more efficient	121	96.8	4 th
vi. Mobile phones reduce information costs	113	90.4	8 th
vii. Reduction in transport costs	118	94.4	6 th
viii. Mobile phones enhance the capacity of fish farmers	117	93.6	7 th
ix. Use of mobile phones increases marketers' income	121	96.8	4 th

Source: Field Survey, 2015 * = Multiple Responses

Through marketing, fish marketers were able to make efficient use of available resources with its multiplier effect of increased income. This corroborates Labonne and Chase (2009) who found strong evidence that purchasing a mobile phone is associated with higher growth rates of incomes, in the range of 11–17 percent, as measured through consumption behaviour. A study of farmers who purchased mobile phones in Morocco also found that average income increased by nearly 21 percent (Ilahiane, 2007). This finding is also similar to Eremie (2008) and De Angels (2008) that farmers and marketers derive various benefits from the use of mobile phones including boost in incomes.

Effect of Selected Socio-economic Characteristics on the Use of Mobile Phones Among Fish Marketers

The effect of selected socioeconomic variables on the use of mobile phones for fish marketing in the study area is presented in Table 3. The model's log likelihood ratio of 21.747 and χ^2 value of 30.692 indicate that all variables in the model significantly influence the probability of the use of mobile phones for fish marketing. The result shows that except for cost of mobile phones and extension contact, all the variables used in the model have direct relationship with the use of mobile phones for fish marketing.

Table 3: Binary Logistic Regression Model Estimates

Variables	Coefficient	Std. Error	T-value
Constant	1.636	6.487	0.64
Age	0.0679	0.0516	1.32
Educational status	1.3801	1.1522	1.20
Extension contact	-7.785	26.963	0.08
Marital status	1.590	4.984	0.102
Annual income	0.00015	0.987	3.005*
Marketing experience	0.2879	0.0214	4.125*
Cost of mobile phone	-0.012	0.005	5.70*

LR $\chi^2 = 30.692$; Prob> $\chi^2=0.0005$; Pseudo $R^2 =0.558$; Log likelihood = 21.747 * = coefficient significant at 5%

Source: Computed from Field Survey, 2015.

Result on number of extension contact implies that, the more the number of contacts with extension agents, the lower the likelihood to use of mobile phones for fish marketing. The negative effect of extension contact on the use of mobile phones for fish marketing did not come as a surprise as majority of the marketers never had access to extension services. Perhaps, marketers who were always in touch with extension agents would be more likely to use mobile phones for fish marketing. Otunaiya and Akinleye (2008) reported that contact with extension workers will increase the likelihood that a farmer will adopt improved technologies. Onemolease and Alakpa (2009) also found that the frequency of extension contacts promotes the adoption of improved technologies.

Annual income had a positive relationship with the use of mobile phones for fish marketing and significant at 5%. This implies that the likelihood to use mobile phones for fish marketing increases with increased annual income. This is evidenced in the fact that the use of mobile phones has associated cost implication like the buying of airtime. In a similar study on media usage among urban and rural farmers, Adejoh (2014) reported that annual income is positively related to the use of mobile phone and significant at 1%.

The coefficient of marketing experience was positively signed and significant at 1%. This implies that the higher the number of years spent in fish marketing, the more the likelihood to the use of mobile phones. This

is not surprising as marketers with more experience tend to have more customers, hence the need to reach their customers for efficient marketing system. This finding supports Overa (2006) who reported that onion wholesalers increasingly use mobile phones to coordinate supply among each other and to improve profits by facilitating reductions in their transportation and opportunity costs. Also, a study from Uganda found that market participation rose with mobile phone access (Muto and Yamano 2009).

The cost of purchasing a mobile phone has an inverse relationship with the use of mobile phone for fish marketing. The negative relationship is an indication that the likelihood to use mobile phone for fish marketing will reduce with increase in the cost of mobile phones. Despite the introduction of “China” phones in Nigerian markets at an affordable rate, most marketers still find it relatively hard to purchase a mobile phone. This has a negative effect on its usage for fish marketing. The cost of mobile phones discourages some fish marketers from adopting the technology for improved and efficient marketing system.

Constraints to the Use of Mobile Phone for Fish Marketing

Constraints to the use of mobile phone for fish marketing are presented in Table 4. Fish marketers in the study area agreed to poor quality of services provided by the telecommunication operators and inadequate extension contact as serious constraints to the use of mobile phones for information dissemination. The services were said to be inconsistent with irregular charges attached. This affected their use of mobile phones for fish marketing. This result agrees with Husseini *et al.* (2009) who reported that low services provided by telecommunication companies and lack of interest by private sector to participate in developing ICT programmes for rural areas affect its usage with its negative effect on agricultural development.

Fish marketers in the study area also agreed to high level of illiteracy as a major constraint affecting the use of mobile phones for marketing. The use of mobile phones for fish marketing requires some level of education. This is necessary for some operations such as sending of text messages, adding contact to phonebook, and other operations that require some level of knowledge. This finding agrees with Musa *et al.* (2008) and Samuel *et al.* (2005) who reported that lack of knowledge was a problem among rural communities and farmers in the use of ICT.

Inadequate capital was also a major problem in the use of mobile phone for fish marketing. This is in agreement with Manalo and Eligio (2011). Use of mobile phone requires capital for the purchase of mobile phone and associated cost such as the purchase of airtime and regular maintenance.

Table 4: Distribution of Respondents According to Constraints Affecting the Use of Mobile Phones for Fish Marketing

S/no	Constraints	Frequency					Sum of Score	Mean Score
		SA	A	U	D	SD		
		5	4	3	2	1		
01	Inadequate extension contact	43	44	1	1	1	397	4.41
02	Low quality of services provided	38	50	2	2	0	400	4.44
03	High level of illiteracy	38	47	1	3	1	388	4.31
04	High cost of mobile phones	9	1	1	13	66	144	1.60
05	High cost of airtime	5	1	8	28	48	157	1.74
06	High cost of maintenance	5	15	38	32	0	263	2.42
07	Language barrier	4	1	11	49	25	180	2.00
08	Low quality of handset	2	3	7	59	19	180	2.00
09	Inadequate capital	12	72	1	4	1	360	4.00
10	Inadequate electricity supply for charging battery	7	76	1	6	0	354	3.93

Source: Field Survey, 2015.

4.0 Conclusion and Recommendations

The use of mobile phones for marketing is essential for the availability and accessibility of relevant market information with its effect on increased income. Other associated benefits include decreased price disparity, and reduction in transportation and information costs. Also, the use of this technology among marketers is influenced by income, experience and cost of the technology. Based on the research findings, the following recommendations are made:

1. Government should enforce the installation of more GSM masts in rural areas with a view to improving the erratic and poor services been experienced in rural communities.
2. There should be provision of education to rural people on the use, modes of application and benefits associated with the use of mobile phones in marketing.
3. There is need for more extension activities in the area of fish marketing. This will improve the level of use and adoption of mobile phone technology.

4. Lack of electricity and poor quality of services provided especially in rural areas should be addressed by relevant bodies to enable marketers enjoy the perceived benefits of mobile phones.

5.0 References

- Abraham, R. (2007): Mobile phones and economic development: Evidence from the fishing industry in India. *Information Technology and International Development* 4 (1): 5-17.
- Adegeye, A.J. and Dittoh, J.S.(1985). *Essentials of agricultural economics*. Impact Publishers Nig. Ltd. 164-177.
- Adejoh, S.O. (2014). Assessment of media usage among urban and rural farmers in Kogi State, Nigeria. *Unpublished Ph.D Thesis*, Department of Agricultural Economics and Extension, Kogi State University, Anyigba, Nigeria.
- Adekanye, T.O. (1988). *The markets for foodstuffs in western Nigeria in agricultural marketing*. Longman Nigeria Limited 12-22.
- Ajani, O.I.Y. (2005). Economic analysis of the marketing of fruits in Lagos State of Nigeria. A case study of Oyigbo, OShodi and Ikotun Markets. *Nigerian Journal of Horticultural Science*, 10:38-46
- Aker, J. C. (2011). Dial "A" for agriculture: A review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*. 42 (6) 631-647.
- Baker, J. (1989). *Agricultural marketing. 2nd edition*. Oxford, Univeristy Press. 56-57.
- Bayes, A. (2001): Infrastructure and Rural Development: Insights from a Grameen Bank Village Phone Initiative in Bangladesh, *Agricultural Economics*. 25: 261-272.
- De Angels, S.F. (2008). Enterprise resilience management Blog: mobile phone in Africa <http://enterprisedresilience>.
- Eggleston, K., Jenson, R. and Zechhauser, R. (2002). Information and communication Technologies. Markets and economic Development. <http://cyber.law.haviand.edy/itg/lipubs/gitrr2002.ch07.pdf> Date accessed 5/7/08.
- Eremie, S. (2008). Boosting farmers' profits through better links to markets. <http://wwwrural/povertyportal-org/English/regionAfrica/2a/voices/dysnlry>
- Hosseini, S.J.F., Niknami, M. & Chizari, M. (2009). To determine the challenges in the application of ICTs by the agricultural extension service in Iran. *Journal of Agricultural Extension and Rural Development*, 1(1), 27 30.
- Ilahiane, H. (2007). Impacts of information and communication technologies in agriculture: Farmers and mobile phones in Morocco. Paper presented at the Annual Meetings of the American Anthropological Association, December 1, Washington, DC.
- Jensen, R., (2007). The digital divide: Information (Technology), market performance and welfare in the South Indian Fisheries Sector. *Quarterly Journal of Economics*. 122(3): 879-924.
- Labonne, J., and Chase,R.S.(2009). The power of information: The impact of mobile phones on farmers' welfare in the Philippines. *Policy Research Working Paper No. 4996*. Washington, DC: World Bank.
- Manalo, J., and Eligio, A. (2011). Making ICT initiatives more relevant: Creating spaces for farmers' participation in ICT policies in the Philippines. In the *Proceedings of the CPR South 6th Conference in Bangkok, Thailand*, 9-10 December.
- Musa, A.H. (2008). Benefiting ICT for all. *Inaugural Lecture Series*. Serdang: UPM Publisher.
- Muto, M., and T. Yamano. (2009). The impact of mobile phone coverage expansion on market participation: Panel data evidence from Uganda. *World Development*. 37(12):1887-96.
- Onemolease, E. A. and Alakpa, S. O. (2009). Determinants of adoption decisions of rural youths in the Niger Delta region of Nigeria. *Journal of Social Sciences*, 20(1): 61-66 (2009)
- Otunaiya, A.O., Akinleye, S.O.(2008). Adoption of improved maize production technologies in Yewa North LGA of Ogun State, Nigeria. *Proceedings of 10th Annual National conference of Nigeria Association of Agricultural Economists (NAAE)* held at University of Abuja. 2008 395-403.
- Overa, R. (2006). Networks, distance, and trust: Telecommunications development and changing trading practices in Ghana. *World Development* 34(7):1301-15.
- Samuel, O., Akinsola, Marlien, E. H., & Jacob, S.J. (2005). ICT provision to disadvantaged urban communities: A study in South Africa and Nigeria. *International Journal of Education and Development Using ICT*. (1) 13-22.
- Stienen, J., Bruinsma, W. and Neuman, F. (2007). How ICT can make a difference in agricultural livelihoods. <http://www.cd.org>
- Waverman, L., Meloria M. and Fuss, M. (2005): The impact of telecoms on economic growth in developing nations in Africa: The impact of mobile phones. *The Vodafone Policy Paper Series*. 3: 10-23.