

Determinants of ICT-based Market Information Services Utilization among Small-sized Agro-based Marketers in Nigeria

Ojo, Olutope Stephen and Oluwatusin, Femi Michael*

Department of Agricultural Economics & Extension Services, Ekiti State University

P. M.B 5363, Ado-Ekiti, Nigeria

*E-mail: femi.oluwatusin@eksu.edu.ng

Abstract: The global proliferation of the use application of ICTs by small-sized agro-based marketers is not only for cost cutting and improving marketing efficiency, but additionally for providing better customer services. The study was mainly carried out to determine the factors influencing the use of ICTs-based Market Information Services (MIS) among small agro-based marketers in Nigeria. Multistage random sampling method was adopted to select 180 small-sized agro-based marketers in the study area. Both descriptive statistics and probit regression model were used to analyse the data collected. The findings showed that the respondents were young and the mean age was 45.64 years. Most (56.67%) of them were female while 70 percent were married with average household size of about 8 persons. The majority (88.90%) went through formal education while 67.78 percent had over 10 years marketing experience. The mean monthly expenses on repair and top up of ICTs devices was ₦3910 while the mean monthly income of the marketers was ₦36500. The majority (91.67%) used mobile phone for MIS. Also, the main determinants of ICTs-based MIS were, age, monthly expenses on ICT, value of assets, marketing experience, years spent in formal school, association membership, and monthly income. The marketers were faced mainly with erratic power supply and financial problems. Based on the findings of the study, it is recommended that capacity building on the use ICTs among the agro-based marketers should be embarked upon through various associations and charging centers with solar power should be provided at the market places.

[Ojo, Olutope Stephen and Oluwatusin, Femi Michael. **Determinants of ICT-based Market Information Services Utilization among Small-sized Agro-based Marketers in Nigeria.** *World Rural Observ* 2017;9(1):72-78]. ISSN: 1944-6543 (Print); ISSN: 1944-6551 (Online). <http://www.sciencepub.net/rural>. 10. doi:[10.7537/marswro090117.10](https://doi.org/10.7537/marswro090117.10).

Key words: ICTs, agro-based, marketers, determinants, mobile phone.

Introduction

The important position of small-sized agro-based enterprises (SSABEs) as engines of growth is demonstrated by countries in different regions of the world. SSABEs are often regarded as the main driver for a country's economic growth. Countries in the Sub-Saharan Africa (SSA) have recognised the positive role that SSABEs can play in their economies development. It has been argued that such businesses can create jobs, broaden the tax base, launch innovate products, diversify risks, and adopt new technology (Brixiova & Asaminew 2010). In Nigeria, there seems to be no clear cut definition for small-sized business enterprise. Some defined it in terms of the initial capital employed, annual turnover, number of employees, or size of the organization. The definition of small sized business may be regional or country-specific. For developing countries, the definition can be based on economic context. SSABEs strive to survive and utilize different affordable and productive resources and technologies available to them. Information and Communication Technologies (ICTs) are among the technologies available to them. According to The World Bank (2003), ICT consists of software, hardware, networks, and media for

collection, processing, storage, transmission, and presentation of information in the form of voice, data, text and images.

Tan et al., (2009) cited by Hassen (2012) highlighted some of the benefits that could be realized by SSABEs when using ICTs to be: having great potential to reduce business correspondence costs; increasing the speed and reliability of business communications; reducing inefficiencies from lack of co-ordination among firms in value chain; building closer relationship among trading partners; effective tools for better communication with customers; facilitating new ways of managing and organizing businesses; creating new business opportunities; and enhancing access to market information and knowledge.

Labonne and Chase (2016) defined Market Information Services (MIS) as provisions of assistances that are of importance concerning series of signals and indicators as they occur in markets about material and non-material goods. Market Information Services (MIS) are made up of networking system that involves many actors such as market information providers, agents, consumers and brokers. ICTs hardware like computers and mobile phones are used

to sustain information supplied by market agents (Buyya and Vazhkudai, 2001). Over the years, ICTs have made access to market information services affordable and unlimited, thus allowing all market actors engage in balanced negotiations that ensure uniform market prices and efficient allocation of goods and services (Jensen, 2007).

Despite these aforementioned importance of ICTs-based MIS, many operators of small-sized agro-based enterprises have not adopted it and hence, the need for this study. The study would examine the socio-economic characteristics of the small-sized agro-based marketers, identify the ICTs components used by the marketers, determine factors influencing the use of ICTs-based MIS and document the constraints to the use of ICTs-based MIS in the study area.

Material and Methods

The research was conducted in the Southwest Nigeria. A random sampling method was used to select 180 small-sized agro-based marketers across the Zone (Southwest). SSABE is defined in this research as an agro-based enterprise established and managed by at least one person. A structured questionnaire was used to collect information from the marketers on the socio-economic characteristics, marketing activities and utilization of ICTs-based MIS. The data collected were subjected to descriptive statistics such as frequency, percentages and means. Also, probit regression model was used to determine the factors

influencing the use of ICTs-based MIS among the marketers.

Model specification

According to Greene (2003), in modeling ICTs-based MIS utilization, we believe that the decision of whether or not to utilize these services (Y) is affected by a set of factors(X) such as, age, monthly expenses on ICTs, household size, value of assets, marketing experience, years spent in formal school, association membership and monthly income gathered in a vector ‘X’ so that

$$Prob(Y = 1|X) = F(X, \beta) \dots \dots \dots 1$$

$$Prob(Y = 0|X) = 1 - F(X, \beta) \dots \dots \dots 2$$

The set of parameters β reflects the effect of changes X on the probability. What is needed now is to develop a suitable model for the right-hand side of the equation 2. For a given explanatory vector, we would expect

$$\lim_{X'\beta \rightarrow +\infty} Prob(Y = 1|X) = 1 \dots \dots \dots 3$$

$$\lim_{X'\beta \rightarrow -\infty} Prob(Y = 1|X) = 0 \dots \dots \dots 4$$

In many analyses the normal distribution has been used, giving rise to the probit model,

$$Prob(Y = 1|X) = \int_{-\infty}^{X'\beta} \phi(t)dt = \Phi(X'\beta) \dots \dots \dots 5$$

For the standard normal distribution, the function $\Phi(\cdot)$ is a commonly used notation.

In explicit form, the probit model used for the analysis can be expressed as:

$$Y_i = \psi_0 + \psi_1 X_1 + \psi_2 X_2 + \psi_3 X_3 + \psi_4 X_4 + \psi_5 X_5 + \psi_6 X_6 + \psi_7 X_7 + \psi_8 X_8 + \varepsilon_i \dots \dots \dots 6$$

Where;

Y_i = ICTs- based MIS (1, if ICTs based MIS is used, 0 otherwise)

X_1 = Age of respondent (years)

X_2 = Monthly expenses on ICTs (₦)

X_3 = Household size (number)

X_4 = Value of assets (₦)

X_5 = Marketing experience (year)

X_6 = Years spent in formal school (year)

X_7 = Association membership (1 member, 0 non member)

X_8 = Monthly income (₦)

β_0, \dots, β_8 = Parameters to be estimated.

ε_i = Error term.

Results and Discussion

Table 1 shows the age distribution of agro-based marketers in the study area. It shows that 66.66 percent of the respondents were below 51 years while 33.34 percents were above 50 years. The mean age was 45.64 years with the standard deviation of 8.37 years. This implies that small-sized agro-based marketers in the study area are relatively young. This may be due to the fact that small-sized agro-based marketing activities involve movement from one place to another. These activities could only be carried out

by young and energetic people. Also, this might be due to the prevalent unemployment situation in Nigeria which has compelled many young people to start small business. This result is very similar to the research findings of Ayoola *et al.*, (2011) and Agunbiade *et al.*, (2015) which put the average age of traders at 43 years and 44 years respectively.

According to Table 1, the majority (56.67%) of the respondents were female while 43.33 percent were male. This indicates that, small-sized agro-based enterprises are dominated by women. In the study

area, men prefer other occupations to trading. It is generally believed that marketing of agricultural products is women's job while production is better done by men. Most (70%) of the respondents were married while just 16.67 percent were single. This shows that marketing is done mainly by those that have family responsibilities. This is necessary in order to provide for the household members. Another implication of these findings is that family labour, if needed by the marketers, would be available to the majority of the respondents.

Moreover, Table 1, indicates that 61.11 percent of the small-sized agro-based marketers had between 1 and 6 household members while those with 7 persons and above were 38.89 percent. The mean and standard deviation of household size for the marketers were 7.9 and 1.7 persons, respectively. This implies that the respondents have a moderate household size. In order to assist the breadwinner of the family, after school, some households in the study area do engage children in hawking and this is highly favoured by moderate household size. Also, the majority (88.90%) of the marketers were able to acquire formal education while few (11.10%) of them did not. This implies that the literacy level among the marketers is very high and it shows that most of them could read and write. Education plays a vital role in the ability of someone to quickly understand the use of modern ICTs devices. This level of literacy among the marketers, would aid effective utilization, communication of strategies to improve sales of their goods and ease access to information from ICTs in carrying out their other marketing activities.

Table 1 reveals that 32.22 percents of the respondents had less than 10 years marketing experience while 67.78 percent had over 10 years and above experience. The mean year of marketing experience was 14.60 percent with 8.1 years standard deviation. This implies that, the majority of the respondents are well experienced in trading of agricultural products in the study area. Since experience is the best teacher, most of the marketers would know the best ICTs component to use for market information services. Also, distribution of respondents by years of ICTs usage shows that 78.90 percent of the marketers indicated less than or equal to 8 years of using ICTs while only 21.10 percent showed that they had been using ICTs for more than 8 years. This is an indication that over the years, larger percentage of marketers uses ICTs and thus appreciates the roles ICTs are playing towards sustaining uninterrupted market for agricultural produce/products through effective communication and easy access to vital information.

Moreover, according to Table 1, monthly expenses on repair and top-up of the ICTs devices

used by the respondents showed that 16.70 percent spent ₦1000 or less every month while those that spent between ₦1001 and ₦4000 were 47.80 percent. In addition, 35.4 percent spent not less than ₦4001 on repair and top-up monthly. The mean monthly expenses was ₦3910. This monthly expenses is very important in order to sustain the use of ICTs devices by marketers. The expenses structure shows that majority of the marketers are ready to spend more in order to gain more knowledge on market information services. Also, on the monthly income, 21.10 percent of the respondents earned less than ₦20000 every month while the majority 66.70 percent made between ₦20001 and ₦80000 monthly. Just 12.20 percent earned over ₦80000 as income every month. The mean value of respondents' monthly income was ₦36500 while ₦6000 and ₦165,000 were indicated as minimum and maximum monthly income respectively. Since the marketers are into small-sized agro-based enterprises, this average monthly income will avail them the opportunity to pay for any repair made, subscribe and top-up during the month. On the issue of ICTs components used, the majority (91.67%) preferred to use mobile phones to both radio and other components of ICTs. The use of mobile phone is rampant among the marketers because, it serves as a substitute for transport and allows timely and cost effective accessibility to vital information. Also this component, allow two-way communications when compared to radio and television. This ICTs component (mobile phone) promotes social cohesion among the users.

Factors Influencing marketers' Utilization of ICT-based MIS

The results of the Probit model (Table 2) revealed factors influencing small-sized agro-based marketers' utilization of ICT-based MIS. Table 2 shows the relationship between some socio-economic characteristics of the respondents and the use of ICTs-based market information services.

Age was negatively and significantly (5%) related to the use of ICTs-based MIS. This implies that as the marketers' age increases, the probability of using ICTs-based MIS decreases. This might be due to the fear of unknown by the marketers. Older people are very careful (risk averse) not to use any innovation that will affect their businesses. This means that older business individual tends to be less prone to take risks than younger individual. A times due to higher responsibilities upon the older people, and in order to reduce marketing cost, information on marketing activities from friends and relatives at no cost may be enough for them.

Table 1: Socio-economic characteristics of respondents

Variable	Frequency	Percentage
Age(year)		
<31	22	12.22
31-40	38	21.11
41-50	60	33.33
51-60	36	20.00
>60	24	13.34
Gender		
Male	78	43.33
female	102	56.67
Marital status		
Single	30	16.67
Married	126	70.00
Divorced	10	5.55
Widowed	14	7.78
Household size		
1-3	58	32.22
4-6	52	28.89
7-9	36	20.00
10-12	16	8.89
>12	18	10.00
Educational level		
No formal education	20	11.10
Primary education	44	24.40
Secondary education	48	26.70
Tertiary education	34	18.90
others	34	18.90
Marketing experience(year)		
<10	58	32.22
10-20	66	36.67
20-30	36	20.00
>30	20	11.11
Years of ICTs usage		
<4	34	18.9
4-8	108	60.00
9-12	32	17.80
>12	6	3.30
Monthly expenses on repair/top-up(₦)		
≤1000	30	16.70
1001-4000	86	47.80
4001-8000	50	27.70
>8000	14	7.70
Monthly income(₦)		
≤20,000	38	21.10
20,001-50,000	64	35.60
50,001-80,000	56	31.10
80,001-110,000	14	7.80
>110,000	8	4.40
ICT components used*		
Radio	94	52.22
Mobile phone	165	91.67
Others	67	37.22

*multiple responses

Another reason why older marketers might not use ICTs-based MIS may be because they have mastered the patterns and tactics of the business. It shows the more marketers mastered the business environment the less the need to be informed about any new market service through ICTs. This result corroborates the findings of Hill et al., (2008) that ICTs adoption for MIS by traders tends to reduce at later ages of traders. Also the result is in line with Samah et al., (2009) that older traders are more risk averse than young traders.

Moreover, according to table 2, monthly expenses on ICTs had negative and significant (1%) effects on the probability of using ICTs-based MIS. This implies that the probability of using ICTs-based MIS decreases as expenses on ICTs increase. This may be necessary in order to cut costs and increase profit. This result is not in line with sekabira (2012) that increase in monthly cost on ICTs attracts traders to its services. Also, the result does not agree with the finding of Ulrich (2003) that increase in monthly cost on ICTs leads to rapid usage of ICTs by traders.

Household size was insignificantly and positively related to the use of ICTs-based MIS. This indicates that as the variable increases the probability of utilizing ICTs for MIS increases. This may happen when marketers have more knowledge on the importance of ICTs for their marketing activities through their educated children. Also, large households' size is expected to be monitored effectively by the household head, combining this task with studying the market situation without using fast and better method such as ICTs may be too tedious and hence the need for ICTs-based MIS as the household size increases.

Value of asset was positively and significantly correlated to the use of ICTs-based MIS. This means that as the value of assets of marketer increases (decreases), the probability of using ICT-based MIS increases (decreases). Due to the heavy asset base of the wealthier individuals, usage of ICTs is common among them.

Marketing experience measured in years was significant at 1 percent level of significance with the probability of using ICTs-based MIS. It also had a negative relationship with ICTs-based MIS usage. This indicates that the more the experience of a small-sized agro-based marketer, the less the probability of using ICTs-based MIS. This is because the experienced marketer, over the years, would have acquired better knowledge of the market and be able to predict and speculate market trends.

Variable years spent in formal school, was positively and highly significantly (1%) related to the use of ICTs-based MIS. This means as the number of

years spent in formal school increases, the probability of using ICTs-based MIS increases and vice versa. The importance of education in any business cannot be overemphasized. Education allows an individual to read, understand and execute technical instructions of most of the modern ICTs devices. This result corroborates the findings of Simeunovic and Russo, (2010) that education plays an important role in the adoption and use of ICTs for services.

Membership of association was significantly (5%) and positively correlated to the use of ICTs-based MIS. This implies that those agro-based marketers that belong to economic associations are more likely to use ICTs-based MIS than their counterparts that do not belong to any association. Members of associations may teach themselves how to

operate those complex modern ICTs devices. Apart from this, most of the time, sensitization on the use and importance of ICTs services is done through various associations. In addition, monthly income also had significant and positive relationship with the probability of agro-based marketers using ICTs-based MIS in the study area. This indicates that the more the monthly income of marketer the more the probability of using ICTs services. More income encourages the marketers to buy ICTs gadgets and pay for the subscriptions of the service providers. The main determinants of the use of ICTs-based MIS are age, monthly expenses on ICT, value of assets, marketing experience, years spent in formal school, association membership, and monthly income.

Table 2: Results of the determinants of agro-based marketers' utilization of ICT-based MIS

Variable	Coefficient	Marginal effect	P-value
Age	-4.986** (2.564)	-3.751	0.021
Monthly expenses on ICTs	-7.249*** (2.207)	-6.557	0.002
Household size	2.338 (2.229)	1.994	0.131
Value of assets	9.016**(4.003)	8.897	0.018
Marketing experience	-3.142*** (1.094)	-2.956	0.001
Years spent in formal school	0.713***(0.231)	1.347	0.005
Association membership	2.507**(0.994)	2.153	0.036
Monthly income	1.418**(0.712)	1.738	0.010
Constant	1.319(1.378)	1.301	0.214
Log Likelihood Function	-33.024		
LR Chi-square	71.043		
Pseudo R ²	0.638		

Source: Field Survey, 2016. *** represents 1% significance level, ** represents 5% significance level Note: Figures in parentheses are standard errors

Constraints to the use of ICTs-based MIS

Table 3: Distribution of respondents by constraints to the use of ICTs based MIS

S/NO	Constraint	Frequency*	Percentage
1.	Erratic power supply	100	70.50
2.	Financial problem	60	66.70
3.	Poor internet connectivity	52	57.80
4.	High cost of ICT equipment	50	55.60
5.	Unwilling attitude of friends to teach others	38	41.10
6.	Too busy	29	32.20

*Multiple responses

Table 3 reports constraints to the use of ICTs for market information services by the respondents. It shows that majority (70.50%) of the marketers reported erratic power supply as the major problem. This problem has affected the establishment of small scale enterprises negatively in Nigeria. Most of the time, marketers rely on those people that are charging

handsets' batteries for money in their areas. These people use generating sets and car batteries. Also, another problem reported by the marketers was financial problem (66.70%). Since the respondents operate on small scale, they are bound to be faced with limited resources to purchase and use other complex ICTs components such as computers, internet,

geographical information systems and CD-ROM. Poor internet connectivity was also a challenge to the use of ICTs-based MIS in the study area. Other constraints facing the marketers were high cost of ICTs equipment, unwilling attitude of friends to teach others how to use the modern ICTs components and even the marketers are too busy to acquire knowledge that will make them ICT compliance.

Conclusion and Recommendations

The use of ICTs is now widespread among businesses of all sizes in Nigeria. Since its introduction, many small sized enterprises such as agro-based enterprises have increasingly used ICTs to improve productivity and provide better services to their customers.

The socio-economic characteristics of the small-sized marketers of agro-based goods and the constraints to the use of ICTs-based MIS were described by descriptive statistics while probit regression model was used to analyse the determinants of ICTs-based MIS among the respondents.

The results indicated that the small-sized agro-based marketers are relatively young and married with moderate household size. Also the majority of the marketers are formally educated and experienced in marketing agricultural goods. Over the years, larger percentage of marketers uses ICTs and monthly expenses on repair and top-up shows that they are ready to spend on ICTs. Most of the marketers use mobile phone for market information services. The main determinants of ICTs-based market information services are, age, monthly expenses on ICT, value of assets, marketing experience, years spent in formal school, association membership, and monthly income. The constraints to the use of ICTs-based MIS are erratic power supply, financial problem, poor internet connectivity and high cost of ICT equipment.

Based on the findings of this research, the following recommendations are hereby put across to the stakeholders.

- Since membership of association is significantly related to the use of ICTs-based MIS services, it is recommended that capacity building on the use ICTs among the agro-based marketers should be done through various associations in the study area.

- Also, since constant power supply is very important, solar power could be made available in a building in the markets for marketers to charge their ICTs devices batteries. In addition, the marketers could purchase extra batteries for their gadgets.

- In order to encourage the marketers on the use of other complex ICTs gadgets for MIS, trainings should be organized from time to time in the market places by cooperative societies and the governments.

- High cost of ICTs components could be tackled if associations and government could purchase and sell at affordable prices to marketers.

References

1. Agunbiade, B.O., Mafimisebi T.E. and Ikuemonisan, E.S. (2015). Pricing Contacts and Price Leadership in the Market for Imported Rice in Southwest, Nigeria; *Rice Genome and Genetics*. 6(5):1-10.
2. Ayoola, J.B., Dangnegnon, C. Dauda C.K., Mando A., Kudi T.M., Amapu I.Y., Adeosun J.O. and Simon K.E. (2011). Socio-economic Factors Influencing Production among Male and Female Farmers in Northern Guinea Savannah Nigeria; Lessons for Prootng Gender Equity in Acton Research; *Agriculture and Biology Journal of North America*, 2(6), 1010-1014.
3. Bolarinwa, K. K and Oyeyinka, R. A. (2011). Use of Cell Phone by Farmers and its Implication on Farmers' Production Capacity in Oyo State Nigeria. *World Academy of Science, Engineering and Technology*, 51, 653-658.
4. Brixiova, Z. and Asaminew, E. (2010). SME Start Ups in Ethiopia: Which Incentives Matter? ADB, Ethiopian Economic Association, Addis Ababa, Ethiopia.
5. Buyya, R. and Vazhkudai, S. (2001). Compute Power Market: Towards a Market-Oriented Grid. International Symposium on Cluster Computing and the Grid, IEEE Computer Society, Washington, USA, May p. 574-589.
6. Falola, A and Adewumi, M. O. (2011). Constraints to Use of Mobile Telephony for Agricultural Production in Ondo State, Nigeria. *Journal of Research in Forestry, Wildlife and Environment*, 4(2), 52-63.
7. Greene, W.H. (2003). Econometric Analysis. New York University, USA: Prentice Hall.
8. Hassen, Y. A. (2012). Role of ICT for the growth of small enterprises in Ethiopia. An M.Sc. thesis, University West, Sweden.
9. Hill, R., Davies P. B., and Williams, M. D., (2008). Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use, *Information Technology and People*, 21(3) 244-255.
10. Jensen. R, (2007). *The Digital Provide: Information (Technology)*, Market Performance and Welfare in the South Indian Fisheries Sector.
11. Labonne J. and Chase R.S. (2016). 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.

12. Samah B. A., Shaffril H. A. M., Hassan M. D. S., Hassan M. A., and Ismail N., (2009). Contribution of information and communication technology in increasing agro-based entrepreneurs productivity in Malaysia. *Journal of Agriculture and Social Sciences.*, 5, No. 3, pp. 94–97.
13. Sekabira, H. (2012). Determinants for adoption of ICT-based market information services by smallholder farmers and traders in Mayuge District, Uganda. An M.Sc. thesis. Makerere University, Uganda.
14. Simeunović D., and Russo N. L., (2010), Prerequisite for Growth: ICT Usage in Secondary Education in Bosnia and Herzegovina *INFOTEH-JAHORINA*, Vol. 9, Ref. F-8, 1028-1030.
15. Ulrich, P. (2003). China's Rural Internet Information Centers: A Project to Reduce Poverty through Access to Information and Communication Technologies (ICTs) in Rural Areas. *Electronic Journal Information System Development Countries*, 12(3), 1-17.
16. World Bank (2003). ICT and MDGs: A World Bank Group Perspective.

3/10/2017