

Constraints in Use of Mobile Phones for Information Dissemination by Public Extension Agents in Delta State, Nigeria

Chukwudumebi L. Egbule and Agwu E. Agwu

Department of Agricultural Extension University of Nigeria, Nsukka

Corresponding author e-mail : chukwudumebi.egbule@unn.edu.ng, ekwe.agwu@unn.edu.ng

ABSTRACT

Mobile phones possess the capacity to rework ways extension workers and farmers interact. This paper identified the constraints that limit dissemination of agricultural information using the mobile phone by public extension agents in Delta state, Nigeria. Data for the study were collected from 64 randomly selected public extension agents in the three agricultural zones of the state. Majority (71.9%) of the respondents had OND/NCE as their highest educational qualification, with an average working experience of about 17 years. Mobile phones were adequate in meeting farmers' information needs on availability of new crop varieties and sale of crop produce ($M = 2.0$). However, factors such as non availability of institutional mobile phone ($M = 2.81$), high call tariff and fluctuating services ($M = 2.3$), and lack of supportive government policies ($M = 2.57$), were identified as major constraints to use of mobile phones for information dissemination by public extension agents. The study concludes that the public extension agents in Delta state are burdened by these constraints in the course of discharging their duties and recommends the need for provision of institutional mobile phones to extension agents, and official hotlines so as to reduce the drudgery associated with the current high farmer to extension agent ratio facing the extension delivery services in the state.

Key words : Constraints; Mobile phone; Information needs; Institutional support

Sustainability and productivity of the agricultural sector depends largely on the quality and effectiveness of extension service delivery among other factors. Kimaro, Makandiwa and Mario, (2010) asserted that there is a gap between agricultural performances and available research information in developing countries. This gap can be attributed to poor extension service delivery as well as limited interactions among technology developers, extension workers and farmers. Poor communication among major actors in the extension service delivery government, NGOs, private sector (agribusiness) as well as farmers hinder the flow of developed innovations to farming communities. Extension workers are known to be the link between farmers and researchers; they bridge the communication gaps that exist. For extension workers to effectively fulfill this role there is need for them to keep abreast of new technological developments (Kimaro, Makandiwa and Mario, 2010).

In the dissemination of information by Agricultural Development Programme (ADP) in Nigeria today, a lot of limitations are encountered when such information have to be passed on through face – to – face contact with farmers and researchers. These limitations include physical distance and lack of transportation facilities. A practical means of bridging these limitations is the introduction and enhanced use of mobile phones (often called GSM) in communicating information to farmers who reside in rural communities. The importance of mobile devices, especially, mobile phones in this regard, cannot be denied in this era of globalization.

A mobile phone, cell phone or hand phone is an electronic device used to make mobile telephone calls across a wide geographic area, served by many public cells, allowing the user to be mobile. A mobile

phone can make and receive telephone calls to and from the public telephone network which includes other mobiles and fixed-line phones across the world. It does this by connecting to a cellular network provided by a mobile network operator. In addition to telephony, modern mobile phones also support a wide variety of other services such as text messaging, multi media services, email, internet access, short-range wireless communications (infrared, bluetooth), business applications and photography. Mobile phones that offer these more general computing capabilities are referred to as smartphones (http://en.wikipedia.org/wiki/Mobile_phone).

Mobile phones have greatly reduced communication costs; this has enabled individuals and firms to send and obtain reliable information quickly and cheaply on different topics as it relates to economy, politics and social networking. An emerging body of research shows that the reduction in communication costs associated with mobile phones has tangible economic benefits such as improving agriculture and labour market efficiency, and producer and consumer welfare in specific circumstances and countries (Jensen, 2007; Aker, 2008; Klonner and Nolen, 2008; Aker, 2010). The adoption of mobile phones in agriculture will have high effect in the development of Nigerian farmers.

One of the basic functions of any extension service remains the transfer and/or exchange of practical information from research to the end-users (farmers) to improve their livelihoods. Extension services assist farmers in deciding where, what and when to plant, how to prepare for planting and best practices related to growing crops, dealing with pests and diseases, harvesting and post harvest processing methods (http://www.anancy.net/documents/file_en/W18034.pdf). Arokoyo (2002) noted that the village

extension worker is the most effective source of information for farmers but certainly is not the most efficient in terms of cost and coverage. He also noted that at the inception of the state wide ADPs in the 1980s, the extension worker: farmer ratio ranged between 1:2000 to 1:3000. This was expected to come down to between 1:800 to 1:1000 by project completion and the withdrawal of World Bank fund. This target was never achieved. The ADP adopted the training and visit (T & V) system of information delivery which was cumbered with so many limitations; hence the inability to achieve its target.

To rise above the T & V system of extension service delivery, there is need for extension service to be appropriately supported with the use of ICTs. It is important to note that to date, the major ICTs used in agricultural extension service delivery in Nigeria are the radio and television. The radio and television have advantages in that a large number of persons are reached at a particular time but these, have not sufficiently been able to meet the information needs of farmers. The advantages of the mass media notwithstanding, the commercialization of radio and television channels have led to limited or non-existence of agricultural information dissemination through these channels. Also, the limited power supply across the nation has the capacity to hamper information delivery in places where agricultural information is available. These limitations can be addressed by mobile phones as not all mobile phones require electricity to function. All a mobile needs is charging the battery, and this can be done with or without electricity.

By improving the communication flow, mobile phones could potentially strengthen the link between farmers, extension agents and research centers, and vice versa – thereby overcoming the disconnect that exists between the two in many developing countries. Based on these advantages and in addition to large usage and increased penetration rates of mobile phones, especially in rural areas, this study sought to determine constraining factors encountered by extension agents (EAs) in Delta state public extension service (otherwise known as the Agricultural Development Programme) in using mobile phone for information dissemination. Consequent upon this, the pertinent questions that guided this research study included: are EAs provided with mobile phone devices and its accessories for information dissemination to their clientele? To what extent are the information needs of farmers met by the extension agents in the use of mobile phones for information dissemination? And what are the constraints faced by extension agents in using mobile phones in information dissemination?

Specifically, the study sought to:

1. Describe the socio-economic characteristics of respondents;

2. Examine the adequacy of using the mobile phone to dissemination information to farmers; and
3. Identify constraints to mobile phone usage in disseminating information to the farmers.

METHODOLOGY

Data for the study were collected from a total of sixty four extension agents (EAs) from the three agricultural zones in Delta state, using a well structured questionnaire. The questionnaire contained relevant questions covering the objectives of the study.

To characterize the socio – economic characteristics of the respondents', they were required to indicate their "sex", "highest educational qualification" and "years of work experience in Delta state ADP".

To examine the adequacy of meeting the information needs of farmers using the mobile phone, a list of information types required by farmers was provided; these included variables like: farming practices, credit sources, training, marketing etc. A 3 point Likert-type scale with options of "very adequate", "adequate", and "not adequate" scaled 3 to 1 respectively, was used to ascertain the adequacy. These values were added to obtain 6, which was divided by 3 to obtain 2, which was regarded as the mean. Variables with mean scores less than 2 revealed that mobile phones were not adequate for the information need, while those with mean scores equal or above 2 showed that mobile phones were adequate for meeting the information need.

To identify the constraints to the use of mobile phone in dissemination of agricultural information, respondents indicated the level of seriousness to which variables like non provision of mobile phones, fluctuating services, low level of education of farmers, erratic power supply etc; acted as constraints to the effective use of mobile phones in information dissemination. A 3 point Likert-type scale with response options of "very serious", "serious" and "not serious", scaled 3 to 1 were used to determine possible constraints as perceived by the respondents. The values on the Likert-type scale were added to get 6, which was divided by 3, to get a mean score of 2. Then respondents' mean scores was obtained for each response item such that any one higher or equal to 2 was regarded as a "possible constraint". Frequency counts, percentages and mean score statistics were used to summarize the data relating to the objectives.

RESULTS AND DISCUSSION

Socio – economic characteristics of the respondents

Table 1 showed that majority (66%) of the respondents were male; and were an average 46 years old. Also, nearly all (93.8%) of the respondents were married, with an average household size of 5 persons. Majority (71.9%) possessed Ordinary National

Diploma (OND) certificates as their highest educational qualification; and has had about 17 years of working experience.

With respect to age of respondents, it can be implied that Delta state public extension service has young and energetic workforce which is needed to effectively disseminate agricultural information in the state. On the other hand, with large years of working experience, extension workers in Delta state public extension service have worked long enough to have acquired experience on the use of modern ICT tools. This assertion is in line with the findings of Ogbonna (2011), which reported that long working experience

Table 1

Socio – economic characteristics of the respondents

Socio-economic characteristics	%	M	S.D
Age			
30 – 40	16.8		
41 – 50	72.5	45.9	4.7
51 – 60	11.2		
Sex			
Male	66.0		
Female	34.0		
Marital status			
Single	4.7		
Married	93.8		
Widowed	1.6		
Household size			
1 – 5	58.2		
6 -10	41.7	5.0	1.6
Educational qualification			
PGD	1.6		
O'Level	6.3	14.6	0.9
OND/NCE	71.9		
B. Sc	20.3		
Years spent in school			
Years of working experience			
Less than 10	8.1		
11 – 20	77.5	16.8	6.0
21 – 30	10.1		
Greater than 31	4.0		
Provision of mobile phones by organization			
No	98.4		
Usage of personal phones for information dissemination			
Yes	92.0		

Source: Field work, July 2012. M - Mean, SD - Standard Deviation

could mean that workers have undergone training and hence could be capable of utilizing ICTs to a great extent in information dissemination. With regards to provision of mobile phones by Delta State ADP, 98.4% of the respondents noted that there was non provision of this device. In essence, it means that Delta state ADP still relies heavily on individual contact

method which is very cumbersome and time consuming; and does not possess the advantage of reaching large number of farmers within a limited period. Despite the no provision of mobile phones by Delta state ADP, 92.0% of the respondents affirmed that they use their personal mobile phones to disseminate information to farmers.

Adequacy of mobile phones in meeting information needs of farmers: On the adequacy of the mobile phone in meeting information needs of farmers, it was found that mobile phone was adequate in disseminating information on availability of new crop varieties and sale of crop produce (M = 2.0). The standard deviations of the mean score were less than 1.0 (Table 2). This shows that the respondents' individual scores in respect of adequacy of mobile phone in meeting the information needs of farmers in these areas did not vary much from the mean. On the other hand, respondents' did not consider mobile phones as adequate in meeting other areas of information needs such as weather updates (M = 1.3), market for sale and purchase of livestock (M = 1.6, and M = 1.7) respectively, credit sources (M = 1.8) and availability of small businesses (M = 1.6). However, it is instructive to note that mobile phones possess the capability of enhancing dissemination of weather information as short messages can be sent regularly to farmers. This is because mobile phones can serve as support for early warning systems in mitigating agricultural risks associated with climate change; thereby safeguarding incomes to be generated from agricultural pursuits. For example, in Turkey, weather forecasts transmitted through short messages services (SMS) provide timely warnings of impending frosts conditions that favoured pests' outbreak (<http://www.ictinagriculture.org/ictinag/sourcebook/module-3-mobile-devices-and-their-impact>). The use of mobile phones in communicating information on weather updates can help in addressing the current issues on climate change adaptation. Also, communication through the mobile phone is a quicker way of getting information on livestock availability; credit sources and availability of small businesses as accurate and timely information are passed on immediately to the benefit of the recipient of the information.

Constraints to the use of mobile phone in disseminating information to farmers: Data on Table 3 show that the major constraints faced by extension agents in the use of mobile phones for disseminating information to farmers include no provision of mobile phones by the organization (M = 2.8), erratic power supply (M = 2.6), lack of supportive government policy (M = 2.6), low level of education of farmers (M = 2.3), fluctuating services (M = 2.3), high call tariff (M = 2.3), no network coverage (M = 2.2), and inadequate numbers of

Table 2
Mean distribution of responses on the adequacy of using mobile phone in meeting the information needs of farmers

Information type	M	S. D.
Farming practices	1.7	0.7
Availability of new crop varieties	2.0*	0.6
Weather updates	1.3	0.4
Markets for sale of crop produce	2.0*	0.6
Market for acquiring livestock (e.g. purchase of birds, etc.)	1.7	0.8
Market for sale of livestock produce	1.6	0.8
Veterinary services	1.5	0.8
Markets for sale of farm produce	1.9	0.6
Credit sources	1.3	0.7
Training	1.8	0.8
Availability of small business	1.2	0.5
Livestock production	1.6	0.8
Processing of farm produce	1.8	0.8
Storage practices	1.6	0.8
Crop production	1.9	0.8
Pest control	1.8	0.8
Labour availability	1.6	0.7

Source: Field work, July 2012. M - Mean. SD - Standard Deviation

Table 3
Constraints in the use of mobile phone in information dissemination

Constraints	M	SD
No provision of mobile phone by organization	2.8*	0.5
High costs of acquiring mobile phone and its accessory	2.1*	0.9
Lack of maintenance e.g. recharging (i.e. where mobile phone is provided)	1.8	0.9
Mismanagement	1.8	0.8
High call tariff	2.3*	0.7
Fluctuating services	2.3*	0.7
Erratic power supply	2.6*	0.7
Network coverage	2.2*	0.8
Low level of education of farmers	2.3*	0.8
Lack of supportive government policies	2.6*	0.7
Information type not suitable for mobile phone usage	1.8	0.8
Inadequate number of mobile phones	2.2*	0.8
Inability to purchase recharge cards	1.8	0.8

Source: Field work, July 2012. M - Mean. SD - Standard Deviation

mobile phones (M = 2.1). This is in line with the findings of Bolarinwa and Oyeyinka (2011), who reported high call tariff, fluctuating services, net work coverage, high costs of mobile phones, and erratic power supply as constraints to the use of mobile phones in information dissemination in Oyo state, Nigeria. The implication of this finding is that the dissemination of information through mobile phones will be limited as the extension agents are handicapped mainly due to infrastructural and policy factors. In essence, it is imperative that these limitations be tackled in order to enhance dissemination of agricultural information through the mobile phone.

CONCLUSION

It is evident from the study that public extension workers in Delta State, Nigeria, were of the view that mobile phones are not adequate in meeting all information needs of farmers. This situation can be attributed to constraints such as: no provision of mobile phones and lack of maintenance of mobile phones where provided, among other factors. A reason to be adduced for this is that provision of the device, informs its utilization which also determines the information types that can be adequately supported using the device. The use of mobile phones apart from

possessing the capacity to increase EA's area of coverage, which can enhance farmers productivity; can also reduce one of the constraints to extension service delivery – high farmer to extension ratio in Nigeria. In essence, this study recommends that Delta state public extension service should provide EAs with

this important device to aid their dissemination of information to farmers in order to reduce the drudgery associated with information dissemination in the state.

Paper received on : August 13, 2013

Accepted on : October 2, 2013

REFERENCES

1. Aker, J. (2008). Does digital divide or provide? The impact of cell phones on grain markets in Niger. *Bread Working Paper 177*
2. Aker, J.C. (2010). Information from Markets near and far: Mobile phones and agricultural markets in Niger. *American Economic Journal: Applied Economics*, vol. 2, : 46-59.
3. Aker, J. C., (2011). Dial "A" for agriculture: A review of information and communication technologies for agricultural extension in developing countries. Available at http://www.cgdev.org/files/1425497_file_Aker_A_for_Agriculture_Final.pdf, Retrieved on 21/10/2011
4. Aker, J. C. and Mbiti (2010). Tufts University. A Paper Prepared for the Conference on Agriculture and Development University of California-Berkeley October 1, 2010
5. Bolarinwa and Oyeyinka, (2011). Use of mobile phones and its implication on farmers' production capacity in Oyo state, Nigeria. Available at <http://www.waset.org/journals/waset/v75/v75-118.pdf>; retrieved 22/6/11.
6. Jensen, R. T. (2007). The digital provide: Information (Technology), market performance and welfare in the South Indian fisheries sector. *Quarterly Journal of Economics*, vol. 122(3) : 879–924.
7. Kimaro, W. H., Mukandiwa, L and Mario, E. Z. J. (2010). Towards improving agricultural extension service delivery in the SADC region. Proceeding of the workshop in information sharing among extension players in the SADC region. 26th – 28th July, 2010, *Dares Salaam*, Tanzania
8. Klonner, S. and Nolen, P (2008). "Does ICT benefit the poor? Evidence from South Africa." <http://privatewww.essex.ac.uk/~pjnolenKlonnerNolenCellPhonesSouthAfrica.pdf>
9. Ogbonna, E. E. (2011). Availability, access and utilization of information communication technologies among staff of women in agriculture sub-programme of agricultural development programmes in north central zone of Nigeria. (Unpub) *M.Sc. Thesis*, University of Nigeria, Nsukka, Enugu state, Nigeria.
10. Ovighwo, B. O, Ifie, P. A., Ajobo, R. T. and Akor, E. I. (2009). The availability and use information communication and technologies by extension agent's in Delta Agricultural Development Project, Delta state, Nigeria. *J. Hum Ecol.*, vol. 27(3) : 185 – 188. Available online: <http://www.krepublishers.com/02-Journals/JHE/JHE-27-0-000-09-Web/JHE-27-3-000-09-Abst-PDF/JHE-27-03-185-09-1924-Ovighwo-B-O/JHE-27-03-185-09-1924-Ovighwo-B-O-Tt.pdf>. Retrieve on 27/3/12 http://en.wikipedia.org/wiki/Mobile_phone http://www.anancy.net/documents/file_en/WD8034.pdf <http://www.ictinagriculture.org/ictinag/sourcebook/module-3-mobile-devices-and-their-impact> <http://www.sadc.int/fair/agricresearch/icart/inforesources/ImprovingExtension.pdf>