

APPLICATION OF MOBILE PHONES IN DISSEMINATING AGRICULTURAL INFORMATION TO FARMERS BY AGRICULTURAL EXTENSION WORKERS IN GIWA LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA

Ali Garba ' Hamza Mohammed ' and Hussaini Suleiman

Kashim Ibrahim Library, Ahmadu Bello University Zaria, Nigeria.

Library and Information Services Division, Institute of Education Ahmadu Bello University, Zaria

Kashim Ibrahim Library, Ahmadu Bello University Zaria, Nigeria.

Abstract: The research was on the Application of Mobile phones in Disseminating Agricultural Information to Farmers by Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria. To achieve this purpose three objectives were formulated with respect to the types of Agricultural information disseminated to farmers by Agricultural extension workers through mobile phone, the frequency of disseminating Agricultural information to farmers by Agricultural extension workers through mobile phone and to discover the challenges of disseminating Agricultural information to farmers by Agricultural extension workers through mobile phone in Giwa Local Government Area. The population of the study comprised of the Agricultural Extension Workers in the Local Government studied. Fifteen copies of structured questionnaires were distributed to the Agricultural Extension workers, out of which ten copies were duly completed and returned representing 66.7%. Descriptive statistics: frequency tables, percentages and charts were used in analyzing the data collected. The findings revealed that. Information on Fertilizers Sources and Use, Market Information, Agricultural Extension Information, Agricultural Technologies Information, Financial Information and weather information are the types of Agricultural Information disseminated to farmers through mobile phone by the Agricultural Extension workers. It was concluded that, Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria apply Mobile phones in the Dissemination of Agricultural Information to farmers, but they are facing some challenges which include Poor network, Lack of Access to Mobile phone by farmers, Low voltage/Battery problems, among others In viewoftheabovea number of recommendations were made among which are Government and Philanthropists should try to provide Mobile phones to farmers free of charge or at subsidized rate. Mobile phone service providers should try to improve and extend their services to all nooks and crannies in Giwa Local Government Area, Kaduna State, Nigeria

Key Words: Mobile phone, Disseminating Agricultural Information, Farmers, Extension workers

I. Introduction

Agriculture is the backbone of the Nigerian economy. Agricultural information dissemination is a key component in improving rural farmer's agricultural production, and it is the basis of extension service delivery thus, leading to improved rural livelihoods, food security and Socio-economic development. Higher agricultural productivity will be realised when the right information in the right format at the right time is disseminated to the farmers by the extension workers. The use of conventional communication channels such as farm/home visit, personal letters, and use of contact farmers, for disseminating agricultural information is counterproductive. This calls for the adoption and application of Information and Communication Technologies (ICTs) devices such as mobile phone by both researchers and extension workers to transmit relevant information to farmers in a most efficient way. [1]

Agricultural extension is an educational service which brings information and new technologies to farming communities to enable them improve their production, incomes and standards of living. With the problem that extension agents face in facilitating direct contact with farmer clients and with researchers due to the physical distances involved and lack of transportation needed for their mobility, the application of mobile phone offers

excellent possibilities, for strengthening research – extension systems and beyond the urban focus. [2]defined agricultural information as the data for decision-making and as a resource that must be acquired and used in order to make an informed decision. Agricultural information enhances and facilitates farming decisions to sustain growth of agricultural activities. This was better driven as [3] emphasized that in the information age, dissemination of information and applying this information in the process of agricultural production will play a significant role in the development of farm settlements.

It is a fact beyond dispute that Information and Communication Technology (ICT) tools such a mobile phones can play an important role in increasing production, income and efficient use of resources for the economic development of the country [4&5]. Improvement of agricultural productivity will be realised when farmers are linked to the right information through an appropriate medium or tool. A mobile phone (also known as a cellular phone, cell phone, hand phone, or simply a phone) has the capacity to make and receive calls over a radio link while moving around a wide geographic area. Nigeria, crossed the 100 million mobile phone subscriptions threshold in the second quarter of 2012, and will continue to be Africa’s biggest mobile market is forecasted to have 168.99 million subscriptions at the end of 2017 [6].The use of mobile phones can be considered to have the potential to deliver relevant, innovative and useful farm information to farmers at much reduced costs. [7&8]. Mobile phones are transforming the lives of many users in developing countries and are widely recognized as an important current and future technology platform for developing nations [5]. In addition to voice communication, mobile phones allow for the transfer of data in multi-media form, which can be used in the context of applications for the purposes of health, education, commerce or governance [9].

Extension delivery according to [10] is a process and medium of disseminating information from the research Centre to the farmers’ door step via the extension agents. It is a process of transfer of technology from the point of formulation to the receiving clientele or user. [11]Viewed agricultural extension is an applied behavioral science, which involves bringing about desirable changes in the behavioral complex of the farming community, usually through various strategies and programs of change, by applying latest scientific and technological innovation. The system of extension was first used in the United States of America (USA) to connote the “extension” of scientific agricultural production knowledge, from the agricultural colleges to the farming community through the process of informal education system (the word “extension meaning “reaching out”). The objectives of agricultural extension as proposed by [11] are:

- (1) Dissemination of the information relating to advanced technology in agricultural production, which includes usage of improved seeds and methods of chemical fertilizers.
- (2) Application of advanced scientific knowledge to the farm and home of the rural people.
- (3) Scientific management of land based farming such as horticulture, sericulture, dairying, poultry etc, by the farming community.
- (4) Overall improvement of the quality of life of the rural people within the framework of the national economic and social policies as a whole.

II. Statement of the problem

Effective Agricultural information dissemination is an important element in achieving rural farmer’s high yield and it is the basis for extension service delivery thus, leading to improved rural livelihoods, food security and Socio-economic development. In Nigeria, there is poor dissemination of agricultural information to farmers. Ozowa as cited in [13] noted that farmers seldom feel the impact of agricultural innovations either due to lack of access or poor dissemination of such vital information. This has become a key constraint or limitation to agricultural development in the country. The use of conventional Agricultural information dissemination channels such as farm/home visit, personal letters, and use of contact farmers, for disseminating agricultural information is counterproductive [1]. It is a fact beyond dispute that Information and Communication Technology (ICT) facilities such as mobile phones, if properly used in disseminating agricultural information can play an important role in increasing production, income and efficient use of resources for the economic development of the country [4&5]. Similarly, [14] stated that there will be quick exchange of agricultural information between the extension workers and farmers if mobile phones are integrated in delivery of agricultural information to farmers in Nigeria.

Consequently, this research is set out to investigate the application of mobile phones in disseminating agricultural information to farmers by agricultural extension workers in Giwa Local Government area, Kaduna State, Nigeria.

III. Objectives of the study

The study is designed to achieve the following objectives:

- ❖ To find out the types of Agricultural information disseminated to farmers by Agricultural extension workers through mobile phone in Giwa Local Government Area, Kaduna State -Nigeria
- ❖ To determine the frequency of disseminating Agricultural information to farmers by Agricultural extension workers through mobile phone in Giwa Local Government Area, Kaduna State -Nigeria
- ❖ To discover the challenges of disseminating Agricultural information to farmers by Agricultural extension workers through mobile phone in Giwa Local Government Area, Kaduna State –Nigeria.

IV. Review of the Related Literature

Agricultural higher productivity is facilitated through effective dissemination of agricultural information to farmers. [15] Viewed agricultural information as agricultural messages via extension services embodied in agricultural technologies and shared between the actors in the agricultural extension system. [13] Conceptualized agricultural information as information passed on to farmers through extension services primarily to help improve economic yield from farm produce and by extension the farmers' living condition. He enumerated the types of Farm Information as follows:

Farm implements, improved seeds, Land management, Pest management, Storage methods, Processing methods, Price, Soil preparation, Irrigation methods, Harvesting methods, Inorganic fertilizer, Environmental practices, Loan/ financial help, Farm labour, Other farm activities, Market, Fertilizer application and Cropping system.

According to [16] rural communes need a wide variety of information such as availability of agricultural support services, Government regulations, crop production and managements, disease outbreaks, adaptation of technologies by other farmers, wages rates, and so on. [17] Classified agricultural information into two broad groups: pure agricultural information and agricultural information inherently tied to new physical inventions. Pure agricultural information refers to any information which can be used without the acquisition of a specific physical technology. On the other hand, agricultural inventions or technologies are those that come in the form of agricultural inputs, management technologies facilitating farm management, and marketing and processing equipment. Agricultural information can be regarded as both agricultural messages via extension and embodied in agricultural technologies and shared between the actors in the agricultural extension system and the rural farmers, which include: 1. Market Information 2. Agricultural Inputs Information 3. Weather Information 4. Agricultural Technologies Information 5. Agricultural Extension Information 6. Fertilizers Sources and Use 7. Financial Information.

Whereas [18] classified agricultural information into the following categories: technical, commercial, socio-cultural and legal Agricultural information.

There are many challenges that retard the effective use of mobile phone in disseminating agricultural information which include among others mobile network in the rural areas and it did not always work as expected in the several initiatives. For example, the text messages were sometimes delayed enroute or jammed. Electronic forms and Short Messaging Services (SMS) on mobile phone were too problematic for large-scale deployment and found errors on critical data. Data loss due to difficulty in saving the data and also due to misuse and breaking of device, Delay in server, no load or battery problems due to irregular voltage from the power source, difficulty in using key pad/loading recharge card, network fluctuation, lack of software and Dearth of appropriate infrastructure. [19]. In the same vein, [20] identified problems of infrastructure and fake/substandard hard and software as the major constraints to the use of ICT tools for extension delivery in Edo State. Nigeria

V. Research Methodology

The study was carried out in Giwa Local Government area, Kaduna State, Nigeria. The population of the study comprised of the Agricultural Extension Workers in the Local Government studied. Fifteen copies of structured questionnaires were distributed to the Agricultural Extension workers, out of which ten copies were duly completed and returned representing 66.7%. Descriptive statistics: frequency tables, percentages and charts were used in analyzing the data collected.

VI. Data Presentation and Analysis

The data obtained from the completed questionnaires were presented and analyzed. Thus, the analysis of the data collected is given as follows:

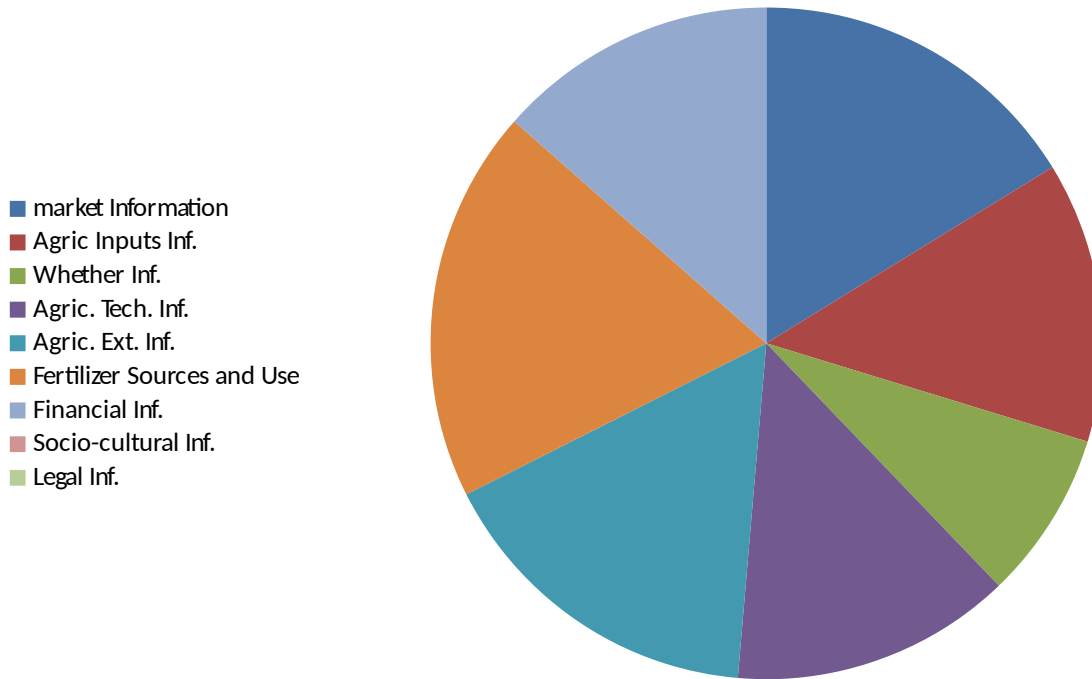


Figure 1: Types of Agricultural information Disseminated to Farmers by Agricultural Extension workers through Mobile phone in Giwa Local Government Area, Kaduna State -Nigeria

Table 1.1 Types of Agricultural information Disseminated to Farmers by Agricultural Extension workers through Mobile phone in Giwa Local Government Area, Kaduna State -Nigeria

S/NO.	Types of Agricultural information	Frequency	Percentage(%)
1.	Market Information	6	60%
2.	Agricultural Inputs Information	5	50%
3.	Weather Information	3	30%
4.	Agricultural Technologies Information	5	50%
5.	Agricultural Extension Information	6	60%
6	Fertilizers Sources and Use	7	70%
7	Financial Information.	5	50%
8	Socio-cultural information	0	0%
9	Legal information.	0	0%

It can be seen from Figure 1 and Table 1.1 that Fertilizers Sources and Use is the type of Agricultural information highly disseminated to farmers in the Local Government studied with the highest frequency of 7(70%), Market Information and Agricultural Extension Information recorded 6 (60%) each, Agricultural Technologies Information and Financial Information 5 (50%) while weather information recorded 3 (30%).

Table 1.2 Format of the Types of Agricultural information Disseminated to Farmers by Agricultural Extension workers through Mobile phone in Giwa Local Government Area, Kaduna State –Nigeria

S/NO.	Types of Agricultural information	Format of the Types of Agricultural information Disseminated							
		VOICE CALL		SMS		MMS		OTHERS	
		F	%	F	%	F	%	F	%
1.	Market Information	3	30	1	10%	0	0%	2	20%
2.	Agricultural Inputs Information	2	20	1	10%	0	0%	0	0%
3.	Weather Information	0	0%	0	0%	0	0%	0	0%
4.	Agricultural Technologies Information	0	0%	2	20%	1	10%	0	0%
5.	Agricultural Extension Information	5	50%	3	30%	0	0%	3	3%
6	Fertilizers Sources and Use	0	0%	7	70%	0	0%	0	0%
7	Financial Information.	5	50%	1	10%	0	0%	0	0%
8	Socio-cultural information	0	0%	0	0%	0	0%	0	0%
9	Legal information.	0	0%	0%	0%	0	0%	0	0%

Key: F= Frequency, %= Percentage, SMS= Short service Message, MMS= Multimedia Message Service

Table 1.2 revealed that Agricultural Extension and Financial Information 5 (50%), Market Information 3 (30%) and Agricultural Inputs Information 2 (20%) are disseminated to farmers through Voice call. Information on Fertilizers Sources and Use 7 (70%), Agricultural Extension Information 3 (30%), Agricultural Technologies Information 2 (20%), Market Information, Agricultural Inputs Information and Financial Information 1 (10%) are disseminated to farmers through SMS. Only one respondent disseminate Agricultural Information in other format.

Table 1.3 Frequency of Disseminating Agricultural information to Farmers by Agricultural Extension workers through Mobile phone in Giwa Local Government Area, Kaduna State –Nigeria

S/NO.	Types of Agricultural information	Frequency of Disseminating Agricultural information			
		DAILY	WEEKLY	MONTHLY	SEASONAL

		F	%	F	%	F	%	F	%
1.	Market Information	1	10%	5	50%	0	0%	0	0%
2.	Agricultural Inputs Information	2	20%	0	0%	1	10%	2	20%
3.	Weather Information	3	30%	0	0%	1	10%	0	0%
4.	Agricultural Technologies Information	2	20%	1	10%	0	0%	1	10%
5.	Agricultural Extension Information	0	0%	3	30%	2	20%	3	30%
6	Fertilizers Sources and Use	0	0%	0	0%	1	10%	5	50%
7	Financial Information.	1	10%	0	0%	1	10%	4	40%
8	Socio-cultural information	0	0%	0	0%	0	0%	0	0%
9	Legal information.	0	0%	0	0%	0	0%	0	0%

It can be seen from table 1.3 that weather information 3 (30%), Agricultural Inputs Information and Agricultural Technologies Information 2 (20%) and Market information 1 (10%) are the types of Agricultural Information disseminated on Daily basis by the Agricultural Extension workers in Giwa Local Government Area, Kaduna State. While Market information 5 (50%), Agricultural Extension Information 3 (30%) and Agricultural Technologies Information 1 (10%) are dissemination to farmers by the Agricultural Extension workers weekly. Some of the respondents also stated that Agricultural Extension Information 2 (20%), Agricultural Inputs Information, Weather Information and Financial Information each recorded 1 (10%) are disseminated monthly. Financial information 3 (30%), Agricultural Extension Information 3 (30%) and Agricultural Technologies Information 1 (10%) are disseminated seasonally.

Table 1.4 Challenges of Disseminating Agricultural Information to Farmers by Agricultural Extension workers through Mobile phone in Giwa Local Government Area, Kaduna State –Nigeria

S/NO.	Types of Challenges	Frequency	Percentage
1.	Data loss	2	20%
2.	Poor network	8	80%
3.	Low voltage/Battery problems	3	30%
4.	Fake/substandard hard and soft ware	1	10%
5.	Hacking	0	0%
6.	Virus attack	1	10%
7	Higher cost of Mobile phone services by Internet service providers	3	30%
8	Lack of Access to Mobile phone by farmers	4	40%

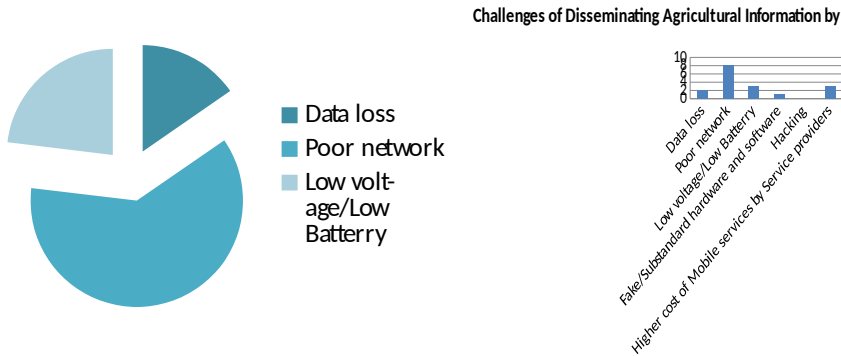


Figure 2

Figure 1

Table 1.4 and Figure 2 shown that poor network 8 (80%), Lack of Access to Mobile phone by farmers 4 (40%), Low voltage/Battery problems 3 (30%), Data loss 2 (20%) and Fake/substandard hard and soft ware 1(10%) are the challenges militating against the effective Dissemination of Agricultural Information in Giwa Local Government Area, Kaduna State. This finding is in line with that of Ganesan, Prashanta and Jhunjhunwala, 2012 and Fawole and Olajide (2012) identified problems of infrastructure and fake/substandard hard and software as the major constraints to the use of ICT tools for extension delivery in Edo State. Nigeria.

VII. Summary of the Major Findings

The major findings of the study revealed that:

1. Information on Fertilizers Sources and Use, Market Information, Agricultural Extension Information, Agricultural Technologies Information, Financial Information and weather information are the types of Agricultural Information disseminated to farmers through mobile phone by the Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria.
2. Voice call and SMS (short message service) are the main format through which Agricultural Extension workers in the Local Government studied disseminate Agricultural Information to farmers.
3. Dissemination of Agricultural Information to farmers via Mobile phone by the Agricultural Extension workers is not done frequently: it was mostly done on weekly basis and seasonal.
4. Poor network, Lack of Access to Mobile phone by farmers, Low voltage/Battery problems, Data loss are the main challenges militating against the effective application of Mobile phone in Dissemination of Agricultural Information to farmers by Agricultural Extension workers in Giwa Local Government Area, Kaduna State.

VIII. Conclusion

Based on the major findings of the study it can be concluded that Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria apply Mobile phones in the Dissemination of Agricultural Information to farmers. But they are facing some challenges which include Poor network, Lack of Access to Mobile phone by farmers, Low voltage/Battery problems, among others.

IX. Recommendations

Based on the major findings of the study the following recommendations are made:

1. Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria should include Legal information and Socio-cultural information among the types of Agricultural Information to be disseminated to farmers.
2. Dissemination of Agricultural Information to farmers via Mobile phone by the Agricultural Extension workers in Giwa Local Government Area, Kaduna State, Nigeria should be done frequently.
3. Government and Philanthropists should try to provide Mobile phones to farmers free of charge or at subsidized rate.
4. Mobile phone service providers should try to improve and extend their services to all nooks and crannies in Giwa Local Government Area, Kaduna State, Nigeria.

References

- I. Salau E. S. and Saingbe N.D (2011) Access and Utilization of Information and Communication Technologies (ICTs) Among Agricultural Researchers and Extension Workers in Selected Institutions in Nasarawa State of Nigeria. *Production Agriculture Technology* 4 (1) retrieved on 15th May, 2015 from www.patnsukjournal.com/currentissue
- II. Samuel Gebre-selassie,(2001) The Development of Integrated Management Information System for Agricultural Extension institutions of Developing Countries , The case of Oromia Agricultural Development Bureau of Ethiopia, Shaker Verlag. Germany.
- III. Available on, http://www.future-agricultures.org/pdf/%20files/SG_paper_1.pdf.
- IV. Accessed March 31, 2008.
- V. Mgbada, J.U.,(2006). Effectiveness of information sources on improved farming practices to *Womenfarmers in Enugu State, Nigeria. Global Approaches to Extension Practice, 2(1)*
- VII. Tsegaye T., (2003) The Impact Of The Participatory Demonstration And Training Extension System On Production And Income Of The Farmers In Potential Areas Of The Amhara Regional State Ethiopia: The Case of YilmanaDensaWoreda. Agricultural Economics Department.Unpublished M.Sc. thesis.Alamaya University. Ethiopia.
- VIII. Lehr, D. (2007): Going Wireless: Dialing for Development (working paper).Retrieved from allAfrica.com. On July 14, 2015.
- IX. John K.K.(January, 9, 2015) Mobile Phone in Nigeria. *DailyIndependent*, p 13.
- X. Abbot, E. and Brandie, M. (2010). Development Calling: The Use of Mobile Phones in Anil, N. (2008). ICT for Agricultural and Rural Development. Accessed from:
- XI. [http://en.wikieducator.org/image/c/ce/information-&-communication\(a-k-sahu\)ppt.pdf](http://en.wikieducator.org/image/c/ce/information-&-communication(a-k-sahu)ppt.pdf) March 15th, 2015.
- XII. Johanes, M.A. (2013) The Role Played by Mobile Phone Communication in Diffusion of Dairy Goats Rearing in Mutonguni Division, Kitui County, (Unpublished Dissertation Kenya, 2013).
- XIII. Rashid A. T And Elder, L. (2009). Mobile Phones and Development: An Analysis of IDARC-Supported Projects. *The Electronic Journal on Information Systems in Developing Countries (EJISDC)* 36: 2, 1-16

- XIV. Olajide, B. R. and E. C. Uwaya (2013) Technical, Organisational and Regulatory Constraints to the Use of Information Communication Technologies (Icts) Infrastructure for Agricultural Extension Delivery in Edo State, Nigeria. *Nigerian Journal of Rural Sociology* 14 (1)
- XV. Bokor R.K (2005). Agricultural Extension: It's Role in National Development. Feature article in Modern Ghana". Retrieved from www.modernghana.com/news/118522/1/a on. 17 November, 2015
- XVI. Soyemi, D. O. (2011) Women Farmers' Agricultural Information Need and Search Behaviour in North Central Nigeria. *Information and Knowledge Management* 4 (8) retrieved from www.iiste.org on 14th May, 2015
- XVII. Campbell, A. (2005). Mobile phones for Small African Farmers. Retrieved August 6, 2015, from <http://smallbiztrends.com/2005/03/mobile-phones-for-small-african.html>
- XVIII. GRINDLE, M. S. (2004) Good enough Governance: Poverty Reduction and Reform in Developing countries. *Governance*, 17(4).
- XIX. 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* NO. 51.
- XX. FAO, (2002) Report of the Second Consultation on Agricultural Information Management.
- XXI. Rome, Italy. [On line]. Retrieved on 12th July, 2015 from <http://www.fao.org/docrep/MEETING/005/Y7963E/>
- XXII. Umali, Lisa Schwartz, Dina L. (1994) Public and private agricultural extension: Beyond traditional frontiers. World Bank Discussion Papers. 236, 15-26.
- XXIII.
- XXIV. Agbamu, J.U.,(2006) Essentials of Agricultural Communication in Nigeria, Lagos: Malthouspress Ltd
- XXV. Ganesan, A, Suma P. and Ashok J. (2012) A Review on Challenges in Implementing Mobile Phone Based Data Collection in Developing Countries. *Journal of Health Informatics in Developing Countries*.6(1) Retrieved from www.jhidc.org on 12/06/2015
- XXVI. Fawole. O.P and Olajide B.R (2012) Awareness and Use of Information Communication Technologies by Farmers in Oyo State, Nigeria. *Journal of Agricultural & Food Information* 13 (4)