

AGRICULTURAL INFORMATION ACCESS AND THE USE OF ICTS AMONG SMALLHOLDER FARMERS:

A Case of Bembeke EPA in Dedza District, Malawi

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Abstract

The present study was carried out to investigate on the contribution of Information and Communication Technologies (ICTs) towards agricultural information access among smallholder farmers. The study employed a cross-sectional research design to survey a total of 120 randomly selected household heads from 10 villages in Bembeke Extension Planning Area (EPA) in Dedza District, Malawi. The main data collecting instruments were semi-structured questionnaire and key informant interviews. Findings showed that the surveyed smallholder farmers had limited access to relevant and accurate information that would help them to boost their agricultural production and marketing of farm produce. This was shown by a significant percentage of the respondents who relied on their own previous experience or fellow farmers and extension officers as means of providing access to most of agriculture related information. A small percentage of respondents accessed agricultural information through radio, TV and mobile phones, which were the only ICT tools used. Some of the factors that affect the choice and use of ICT tools amongst respondents were high costs of acquiring the tools and poor enabling infrastructures. The study thus recommends that the Government through the relevant ministry should create awareness to smallholder farmers on the importance of accessing current agricultural information from credible sources and the opportunities that ICTs offer for timely access to information. Moreover, the Government should create an enabling environment for the growth of ICT industry and scale out the establishment of rural tele-centres, among other recommendations.

Keywords: Smallholder farmers, ICTs, Agricultural information access, Malawi

1.0 INTRODUCTION

1.1 Background Information

Like many other African countries, Malawi's economy relies heavily on agriculture. According to the population and housing census of 2008 Malawi population was 13,077,160 with about 90% of the population living in rural areas (Government of Malawi (GOM), 2008a). Kachule (n.d.) pointed out that agriculture accounts for 37% of Malawi GDP, accounts for over 80% of the labour force, and represents about 80% of all exports. This tells that the agriculture sector in Malawi plays a vital role in enhancing economic development of the country and there is no way it can be foregone in the near future. Estate and smallholder farmers characterize the agricultural sector. Almost 70% of the agricultural produce comes from smallholder farmers (Anderson, n.d).

Farmers need access to reliable information for their agricultural activities. According to Gakuru *et al.* (2009) some of such information are; crop market prices, weather information, information about transportation and storage facilities as well as crops and cattle diseases and fertilizers. Farmers also require the direct interface with extension workers for consultations about their agricultural activities. In line with this, Kydd and Doward (2004) and Poulton *et al.* (2006) as cited by Katengeza *et al.* (2011) said that the failure of agricultural markets for smallholder farmers often results from lack of access to information or from the endemic problem of information asymmetry between farmers and buyers. A study by Makoka and Kachule (2013) found that smallholder farmers are operating in an environment where availability and flow of market information is very poor and greatly contributes to poor access to markets. Manda (2009)

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thus suggested that to solve the problem of market failure, one important mechanism is the provision of access to agricultural information.

Information and Communication Technologies (ICTs) have got the potential to improve agricultural information access to farmers (Chapota *et al.*, 2014). As defined by the World Bank (2011), ICTs are devices, tools, or applications that permit the exchange or collection of data through interaction or transmission. The importance of ICTs lies less in the technology itself but in its ability to create greater access to information in underserved populations hence offer a potentially powerful mechanism for promoting social and economic growth (Microsoft, 2004). Recent efforts to tackle lack of access to agricultural market information in Malawi have thus focused on ICTs applications. Studies provide evidence that there prevails ICTs usage among farmers in Malawi. For example Okello *et al.* (2011) revealed existence of a number of ICTs-based interventions that were applying both new generation ICT-based tools such as telephones and internet and older ICT-based technologies, namely radio and television (TV).

Katengeza (2012) pointed out that ICT interventions have attracted attention because they are more effective in communicating knowledge to rural farmers, they are more cost-effective and they facilitate access to markets. It is for this reason Chim'gonda-Nkhoma (n.d.) alleged that Malawi is poised to succeed in the application of ICT tools such as web tools in the promotion of innovation platforms in support of agricultural technology. Manda (2009) and COMESA Secretariat (2007), as cited by Katengeza (2012), also said that in Malawi provision of ICT-based market information service is carried out by a number of providers. These include Malawi Agricultural Commodity Exchange (MACE) Programme, Food and Nutrition Security Joint Task Force (FNSJTF) of the Ministry of Agriculture and Food Security (MOAFS), Agriculture Commodity Exchange for Africa (ACE) and National Smallholder Farmers' Association of Malawi (NASFAM). Chim'gonda-Nkhoma (n.d.) added that agro-based institutions in the country have developed websites to facilitate sharing of agricultural information and knowledge. As these studies indicate, it is tending that some smallholder farmers in Malawi use ICTs to access information for agricultural activities. However, the extent and driving forces for such usages as well as how such usages have contributed to improving agricultural information access are not certain. It is for this reason, therefore, the present study was carried out.

1.2 Problem Statement and Justification

In Malawi, there is inadequate information on the contribution of ICTs towards agricultural information access. Several existing studies have only focused on ICTs applications for agricultural market information (see for example, Okello *et al.*, 2011; Chim'gonda-Nkhoma, n.d.; Makoka and Kachule, 2013; Katengeza, 2012). In fact much has not been done to investigate on farmers' assorted usages of ICTs. It is also observed that studies that investigated ICT uses by smallholder farmers tends to focus on only one tool at a time. For example Katengeza *et al.* (2011) focused only on mobile phones, Chapota *et al.* (2014) focused on radios and Chim'gonda-Nkhoma (n.d.) on web tool applications. This kind of focus delimits comparability of farmers' preferences on the use of the existing ICT tools, and the driving forces towards those preferences. The focus of this study was on the comparative uses of ICTs by smallholder farmers for two reasons. First, the findings would enable agricultural policy makers and extension workers to understand how smallholder farmers use ICT tools to access agricultural information. Secondly, the study findings would enable the policy makers and extension workers to communicate agricultural information to the farmers more effectively. This is essential because information is an important resource for effective planning and implementation of agricultural production and marketing activities of all relevant stakeholders.

1.3 Objectives of the Study

1.3.1 General objective

The main objective of this research was to investigate on the contribution of ICTs towards agricultural information access among smallholder farmers in Dedza District, Malawi.

1.3.2 Specific objectives

More specifically, the objectives of this research were:

- i. To investigate ways in which smallholder farmers use to access information for their different agriculture related activities
- ii. To assess the extent to which ICT tools are used by smallholder farmers to access agriculture related information
- iii. To establish factors affecting choice and use of ICT tools amongst smallholder farmers

1.4 Research Questions

The study was guided by the following research questions:

- i. How do smallholder farmers access information for their agricultural activities?
- ii. To what extent do smallholder farmers use ICT tools to access agriculture related information?
- iii. Which factors affect the choice and use of ICT tools amongst smallholder farmers?

2.0 LITERATURE REVIEW

2.1 Agriculture sector in Malawi

The socio-economic indicators show that the majority of the Malawian population are poor. According to the household socio-economic characteristics report of the Integrated Household Survey 2010-2011 (IHS3) the national poverty rate is 50.7% indicating that almost half of the population is poor. The report furthermore shows that about 85% of households in Malawi are engaged in agricultural activities (GOM, 2012). Agriculture being a major economic activity for the country has a great role to play in reducing levels of poverty (Kachule, n.d). Makoka and Kachule (2013) added that in many developing countries with low endowment of mineral resources, such as Malawi, agriculture remains the engine of growth as its growth contributes more to income growth among the rural populations than any other sector. It is further contended by the authors that agricultural growth stimulates growth in other sectors of the economy by expanding demand for goods and services that are produced outside the agricultural sector.

The agricultural sector in Malawi is characterized by estate and smallholder sub-sectors. The smallholder sub-sector has been the major producer of food crops while the estate sub-sector has contributed greatly to foreign exchange earnings. The agricultural production is heavily concentrated on crop production, predominantly maize, rice, cassava, pigeon peas, beans, groundnuts, and pumpkins as food crops and tobacco, sugarcane, tea, cotton, groundnuts, rice and coffee as cash crops. Almost 70% of the agricultural produce comes from smallholder farmers (Anderson, n.d.) and, according to GOM (2000) the smallholder sub-sector occupies about 80% of the land.

Much as the country's economy depends on agriculture with emphasis on crop production, both crop yields and livestock production have, nevertheless, remained below potential and agricultural markets, and agricultural extension and advisory services have also been inefficient (Makoka and Kachule, 2013; Chapota *et al.*, 2014). The continuing increase in the number of farming families in the country has led to a growing emphasis on approaches that reach more people at a time. Access to high-value markets remains a big developmental challenge for the agricultural sector in Malawi. The government and other stakeholders have thus initiated various efforts to address the key challenges in the sector. For instance, the government has ensured the promotion of access to markets in some strategic policy documents such as the Vision 2020 and Malawi Growth and Development Strategy II (MGDS II) (Makoka and Kachule, 2013).

2.2 The Need for Information Access by Farmers

Studies across the region and beyond have shown that access to agricultural information among farmers has always mattered. Ever since people have grown crops they have sought information from one another. Farmers in a village may have planted the “same” crop for centuries, but over time, weather patterns and soil

conditions change and epidemics of pests and diseases come and go. Updated information allows the farmers to cope with and even benefit from these changes (World Bank, 2011). Katengeza (2012) added that the type of information commonly needed by farmers include information on what to plant, planting decisions, current prices, historical prices, and information on weather.

A study by Makoka and Kachule (2013) about smallholder farmers' access to agricultural markets in Malawi found that smallholder farmers are operating in an environment where availability and flow of market information is very poor and greatly contributes to poor access to markets by the farmers. Farmers would want to know what commodities are in demand, where and when the commodities are demanded, quantities demanded, grades and standards required, prices offered, terms of delivery and payment. Such type of information is necessary for farmers to make decisions on whether to produce and supply the commodities as demanded. Unfortunately, this type of information is scanty and difficult for the farmers to access and make use of.

When discussing about ICT applications for agricultural risk management, World Bank (2012) identified that information about what needs to be done, when, how, and why is fundamental for smallholders and other stakeholders in the agricultural sector to implement actions to mitigate risk, transfer risk before it occurs, and determine how to cope once those events have occurred. Farmers' information needs and sources are varied and change throughout the agricultural production cycle, but all farmers require a comprehensive package of information to make decisions related to risk. World Bank (2011) pointed out that farmers would also want to have information on commodity exchange, government services available, findings from agriculture research institutes, and banking and insurance services.

As the literatures show, information is very important for agricultural undertakings. However, there are practices of farmers using habitual methods to obtain information for their agricultural activities. For example, most farmers who participated in a study done in Kenya by Crandall and Colaço (2012) use the predicted amount of rain to determine how much to grow and when to grow their crops. The price of seeds was also mentioned as an important determinant for how much to grow and when to grow. Other studies by CTA (2007), Stienen, *et al.* (2007) and Weldemariam *et al.* (2012) indicates that farmers in most developing countries obtain information on chemicals (e.g., fertilizer and pesticides), and farm implements and seeds from their fellow farmers. It is further pointed out in the same studies that farmers generally obtain information which may not be reliable and trustworthy by word of mouth from other farmers, neighbours, local schools, price-boards at markets, NGOs and religious or community leaders. As an attempt to overcome this, different mechanisms are being put in place to facilitate farmers' access to reliable information. Among these mechanisms, the use of ICTs is advocated by many.

2.3 ICTs Use in Agriculture

It is evident from literature that ICTs applications play an important role in agriculture. According to TechTerms (2010) ICTs are tools/devices that permit the exchange or collection of data through interaction or transmission. Stienen *et al.* (2007) and World Bank (2011) added that ICT is an umbrella term that encompasses radio, television, cellular phones, digital cameras, computers, computer networks, satellite systems, Geographic Information Systems (GIS), etc., ICT use in agriculture help to tackle the challenges concerning information access and communication (Chapota *et al.*, 2014). Owiny (2011) and Stienen, *et al.* (2007) pointed out that the use of ICTs in agriculture advocates to timely weather forecast, and other valuable information can be easily disseminated to farmers. The authors added that through the ICT platforms such as community radios early warnings, plant varieties, marketing opportunities and much other agricultural information can be disseminated. Regular short text messages can furthermore be used to remind farmers about pest and disease control measures, post-harvest strategies and loss mitigation.

2.3 Previous Studies and Research Gap

Okello *et al.* (2011) in their study 'Factors Influencing Awareness and Use of Electronic – Based Market Information Services for Farming Business in Malawi' examined awareness of ICT-based market interventions and use of ICT-based MIS in the country. The authors concluded that farmers in Malawi face major difficulties in marketing their products due to lack or poor access to market information. Makoka and Kachule (2013) studied on smallholder farmers' access to agricultural markets in Malawi, with special consideration to women, among other things found that smallholder farmers are operating in an environment where availability and flow of market information is very poor and greatly contributes to poor access to markets by the farmers. The authors recommended, among other things, establishment of a comprehensive market information system. Katengeza (2012) investigated the operational environments and performance of the two ICT-based market information services. These were Malawi Agricultural Commodity Exchange (MACE) and Food and Nutrition Security Joint Task Force (FNSJTF) which were all made to contribute to agricultural marketing in the country. The author concluded that the contribution has been through the provision of market information and in some instances, agronomic information. All these studies, and many others, focus only on how agricultural market information can reach the farmers. But as it is said by Owiny (2011) and Hall (2011), farmers also need information on weather forecasts, early warnings, plant varieties, and pests and disease control measures, etc., which is not the case with these previous studies.

Mloza *et al.* (n.d.) studied on the use of ICT-enhanced Participatory Radio Campaigns in Climate Change Adaptation. The authors used Farm Radio Trust as their case study. The aim of their study was to showcase a success story of how smallholder farmers in Malawi are accessing demand-driven extension services on climate-smart agricultural innovations through an approach called 'ICT-enhanced Participatory Radio Campaign'. Although this study was not meant to evaluate the use of radio against other ICT tools among smallholder farmers but it ended up concluding that Farm Radio Trust has managed to contribute to breaking the digital divide that hinders technology and knowledge transfer to the communities through mobile phones and other ICTs. Other studies by Sullivan (2011) and Chapota *et al.* (2014) were also focused on surveying the role of radio in providing farmers with agricultural information. As it was with Mloza *et al.* (n.d.) these studies were also focused on only one ICT tool, the radio, Farm Radio in particular.

A study by Katengeza *et al.* (2011) deviated from radio and surveyed a different ICT tool as used by farmers. The study focused on the use of mobile phones among smallholder farmers in Malawi for agricultural marketing. As partial justification for investigating on mobile phones, the study pointed out that mobile phone is the most widely used ICT tool by households in developing countries. However other studies like Chipota *et al.* (2014) mentioned that radio regularly reaches 70% of rural households, and the Malawi national population and household census report of 2008 indicates that nationally 64.1% of households own radios (GOM, 2008a). On the other hand the International Telecommunication Union (ITU) (2014) indicated that in 2008 Malawi had a total of 1,507,684 mobile phone subscriptions, which was equivalent to about 11% of the country's population at that time, contrary to what Katengeza *et al.* (2011) asserted. This tells that without conducting a study that involves different ICTs tools it is difficult to say which one farmers mostly use. The same tendency of surveying the use of only one ICT tool at a time was also observed in Chim'gonda-Nkhoma (n.d.) who studied on potential for Web Tool applications to support innovation platforms in agricultural technology in Malawi. The literatures hence show a gap and thus a need for conducting a research that will survey various ICTs tools as used by smallholder farmers.

3.0 METHODOLOGY

3.1 Research Design

The study involved the use of a cross-sectional research design to generate data. Among the many benefits of a cross-sectional study design is the fact that the design allows a researcher to compare many different variables at the same time. By using this study, therefore, the researcher was able to take into account several variables in investigating the use of ICTs among smallholder farmers in the study area.

3.2 The Study Area

This study was conducted in Bembeke Extension Planning Area (EPA) in Dedza district, Malawi. The choice for Dedza district was based on the fact that the major economic activity of smallholder farmers in the district is agriculture. The agricultural activities of smallholder farmers in the district involve production of both food and cash crops (GOM, 2008b). The other reason is that the district is close to Bunda in Lilongwe where the researcher was based. Bembeke was the only EPA surveyed in the district due to inadequacy of financial resources.

3.3 Population, Sampling and Sample Size

The study population constituted smallholder farmers in Bembeke EPA, Dedza district. The EPA has 20 Group Village Heads (GVHs). A total of five GVHs randomly selected were surveyed. The reason for using random sampling was to give equal chance for all GVHs, villages and households in the study area to be involved in the survey. In each sampled GVH two villages were randomly selected and in each village a total of 12 households were selected at random. Household head of each of the selected households were interviewed. Thus, a total of 120 household heads made a sample size for this study. Table 1 shows a list of GVHs and respective villages surveyed.

Table 1: Surveyed GVHs and their respective villages

S/N	Group Village Head (GVH)	Villages
1	Kamenyagwaza	Kamenyagwaza 1 and Kamenyagwaza 2
2	Kamgulitse	Katsotso and Masula
3	Kantande	Chitsonga and Chimulambe
4	Kapenuka	Chizimba and Chimonjo
5	Ngonowonda	Malili and Ngonowonda

Source: Researcher's construct 2014

3.4 Data Collection Instruments

Three data collection instruments were employed in the study. The first two were household survey using a semi-structured questionnaire and key informant interviews. These were used to collect primary data. The third instrument was review of existing documents, which helped to collect secondary data.

3.5 Data Analysis and Presentation

The data that was collected was checked for consistency, uniformity and accuracy. Thereafter they were coded and then analyzed. A computer-assisted data analysis software package was used to analyze the collected data. Specifically, the study used the Statistical Package for the Social Sciences (SPSS) to analyze quantitative data where by distributions and magnitude of individual variables among respondents (such as percentages and frequencies) were determined.

4.0 RESULTS AND DISCUSSIONS

4.1 Demographic Characteristics of Respondents

4.1.1 Sex, age and education level

The study involved 120 respondents (household heads) as Table 2 depicts. Out of these, 54 (45%) were males and 66 (55%) were females. It was learned that at the time the survey was conducted most of the males were in the fields (farm works) while their wives were at home, thus assumed household headship, hence more females than male respondents. Moreover, 59 (49.2%) of all respondents were aged from 18 to 35 years, 37 (30.8%) were from 36 to 55 years and 25 (20.0%) were above 55 years of age. It was furthermore found that 37 (30.8%) respondents never attended school, 64 (53.3%) attended primary schools, 18 (15.0%) attended secondary schools and one (0.8%) attended vocational training. None of the respondents attended university/college. A finding on education level is somehow similar to the finding in the IH3, which indicate that 34.4% of the Dedza population (aged 15 years and above) has never attended school (GOM, 2012). Regnar *et al.* (2002) considered the ultimate objective of education as to increase labour productivity and thus it is a productive factor that is very important for one's ability to utilize efficiently the advice and information offered by the extension service and other development agents.

Table 2: Sex, Age and Education level of respondents (N=120)

Variable	Category	Frequency	Percentage
Sex	Male	54	45.0
	Female	66	55.0
	Total	120	100.0
Age (Years)	18 – 35	59	49.2
	36 – 55	37	30.8
	Above 55	24	20.0
	Total	120	100.0
Education Level	No formal education	37	30.8
	Primary education	64	53.3
	Secondary education	18	15.0
	Vocational education	01	0.83
	Total	120	100.0

Source: Survey, 2014

4.1.2 Farmers' affiliation

A large proportion of respondents (76.7%) are not affiliated to any farmers' group or club. This may create difficulties in accessing them as far as information sharing is concerned. The remaining proportion of respondents (23.3%) is affiliated to diverse groups. Some of them (5.8% of all respondents) are affiliated to Irrigation scheme, 3.3% are affiliated to the Farmers Union of Malawi (FUM) and groundnuts farming group each, 2.5% to the National Smallholder Farmers Association (NASFAM) and Concern Universal and Forest Management Club each, 1.7% to Group of Manure Making, and 0.8% to CADECOM and FINCA each.

4.2 Respondents' Agricultural Activities

4.2.1 Agricultural trainings attained

The study observed that most of respondents (64.2%) have never had any training concerning agricultural activities. This is likely to compel respondents to do their agricultural activities in a business-as-usual fashion and thus lacks updated information. The World Bank (2011) observed that farmers in villages may be planting the "same" crop for centuries, but over time, weather patterns and soil conditions change and epidemics of pests and diseases come and go. Updated information allows the farmers to cope with and even benefit from these changes. For those who had training (35.8%) none of them had any training on the use of

modern technologies, such as ICTs, in their agricultural undertakings. Table 3 shows multiple response results of various agricultural trainings attained by respondents.

Table 3: Agricultural trainings attained by respondents (N=120)

Type of agricultural training attained	Frequency	Percent
How to make peanut backup using groundnuts	1	1.6
Irrigation scheme	6	9.4
Agriculture activities in general	6	9.4
Groundnut farming	3	4.7
Potato farming	6	9.4
One-one planting system of maize	15	23.4
Land conservation	4	6.2
Grafting tree seeding	4	6.2
How to make compost manure	8	12.5
How to apply fertilizer	2	3.1
Bean farming	1	1.6
Husbandry practices on the legume crops	2	3.1
Agricultural marketing	2	3.1
Postharvest handling	4	6.2
Total	64	100.0

Source: Survey data, 2014

4.2.2 Types of crops cultivated

It was observed that respondents grow both food and cash crops. The top three food crops grown by respondents are maize (28%), beans (21%) and Irish potatoes (14%). In the case of cash crops Irish potatoes (26%), sugarcane (20%) and tomatoes (17%) are the leading crops grown. Figure 1 (a) and (b) depicts these findings. This confirms the findings by GOM, 2008b and thus tells that agriculture in Dedza is not only for feeding the households but it is also a source of income.

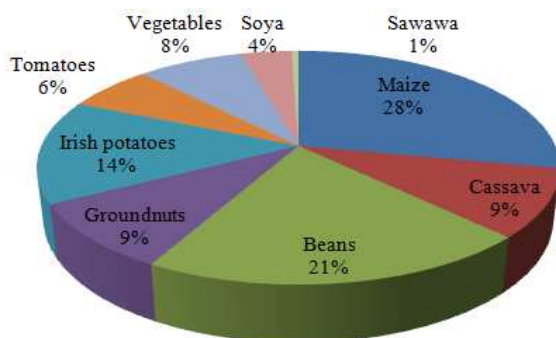


Figure 1 (a): Food Crops

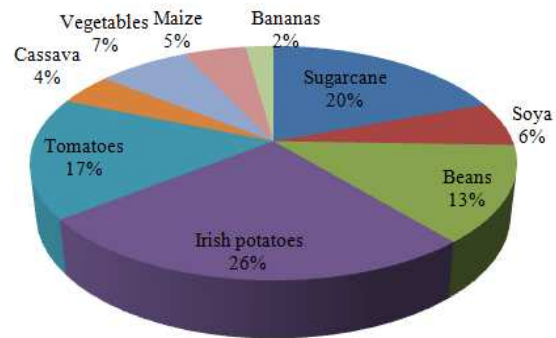


Figure 1 (b): Cash Crops

4.3 Agricultural Information access

4.3.1 Sources of information

The study observed that respondents use four different sources of information for their different agricultural activities. These sources were previous experience, fellow farmers, extension officers and technologies. In most cases respondents' previous experiences turned out to be the major source of information. As Figure 2

depicts, significant percentage of respondents rely on their previous experience as source of information for when to start growing (37.7%), and for mechanisms to control pests/diseases (30.1%). Extension officers were in second place as source of information, relied upon by respondents when they want to know about fertilizer applications (45.2%) and for postharvest handling (33.2%). Concerning information about new seed varieties most farmers (32.8%) rely on their fellow farmers as information source. About access to market information, as shown in Figure 3, the study found that some farmers (29.2%) rely on middlemen as source of information. While McNamara *et al.* (2011) point out that the arrival of ICTs has made it possible for timely and accurate information access to farmers thus create green revolution and greatly improved agricultural productivity, technologies never emerged as the leading source of information to any of these agricultural activities among the surveyed respondents.

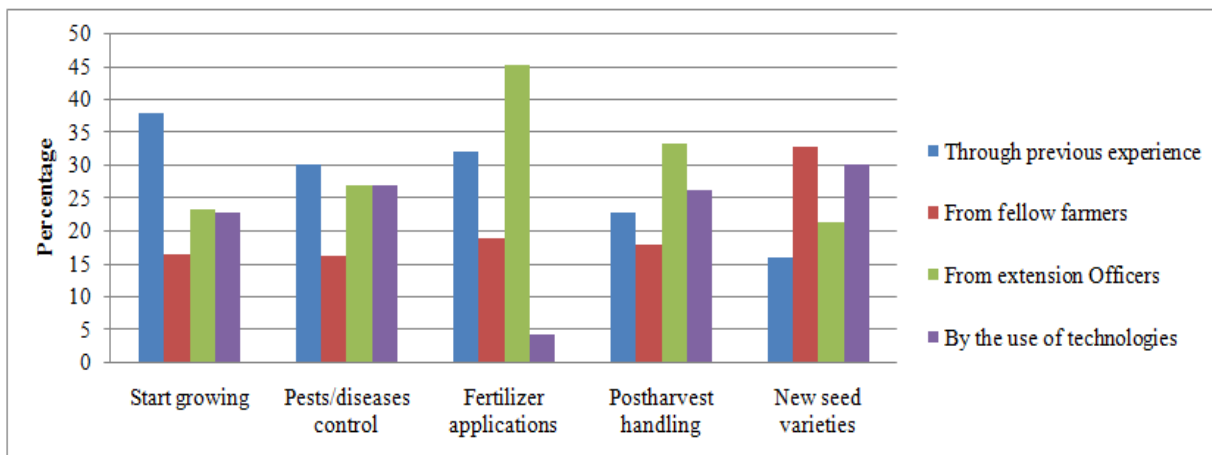


Figure 2: Sources of information for different agricultural activities

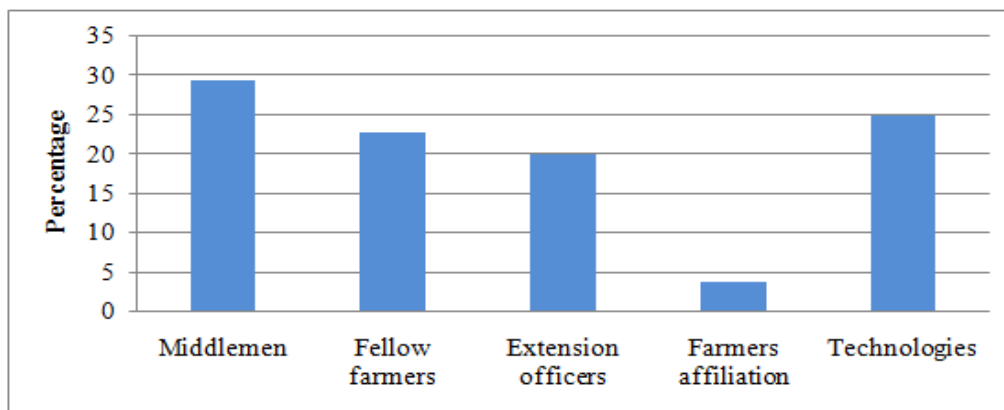


Figure 3: Sources of market information

4.3.2 Records keeping methods

A large share of respondents (65.8%) does not keep records regarding their agricultural activities as compared to 34.2% who keep records. For those keeping records most of them (76.2% of those keeping records) keep them in paper files, others (16.7%) keep them in their heads (memorize) and only 7.1% keep records with the aid of technologies as shown in Figure 4. This finding also tells a lowest use of technology in agricultural record keeping.

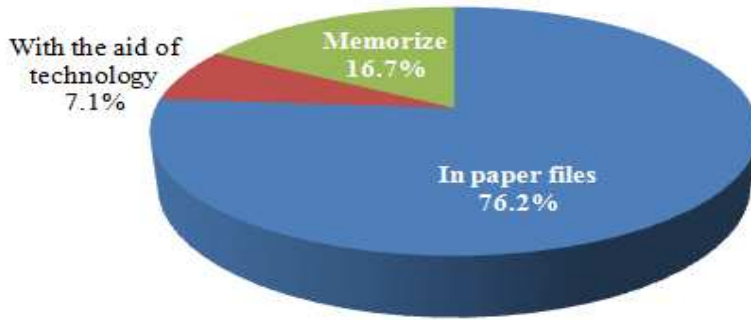


Figure 4: Methods of agricultural record keeping

4.3.3 Information dissemination

The study discovered that as part of information dissemination the government of Malawi through the Ministry of Agriculture uses Esoko platform to send SMS to farmers reminding them to listen to special radio programs about agriculture. According to esoko.com Esoko is an information and communication service platform that helps to manage agricultural value chains. Smallholder farmers in the study area receive SMS from Esoko at an interval of time; they are advised to keep record of the received SMS in notebooks. Figure 5 is a snapshot of Esoko SMS as received and recorded by one of the farmers. The SMS are in Chichewa (Malawi’s national language). For example, the highlighted text of the SMS that was received on 1st August 2014 at 09:25am, says “Mverani programme ya ulimi pa MBC Radio1; Lachitatu 1:30 Masana, Lachinai 1:30 masana, Loweruka 11:30 Mmawa, Lamulungu 7:15 Madzulo. Radio2; Lolemba 6.00 Madzulo” which means “Listen to radio program concerning agriculture at MBC Radio1; on Wednesday 1:30pm, on Thursday 1:30pm, on Friday 11:30am, on Sunday 7:15pm, and Radio2 on Monday 6:00pm”. Esoko platform also allows farmers to ask questions concerning agriculture, among others. The study observed however that very few farmers use the service.

Concerning respondents communication with extension officers for agricultural information dissemination, the following were found; 53.9% of respondents said that extension officers normally visit farmers in their places to disseminate agricultural information, 34.0% said they only communicate in formal meetings, 5.0% said they use phones to communicate, 4.3% said farmers visit extension officers’ offices and 2.8% said they never communicate. Findings from interviews with extension officers also revealed that in most cases extension officers visit farmers physically (some of the extension officers have motorcycles to facilitate their movements) so as to disseminate agricultural information. In some cases they disseminate information through letters written to farmers through Lead Farmers. Lead Farmers are village extension agents/volunteers who reside within the target community/villages. In a few cases they communicate by phone calls.

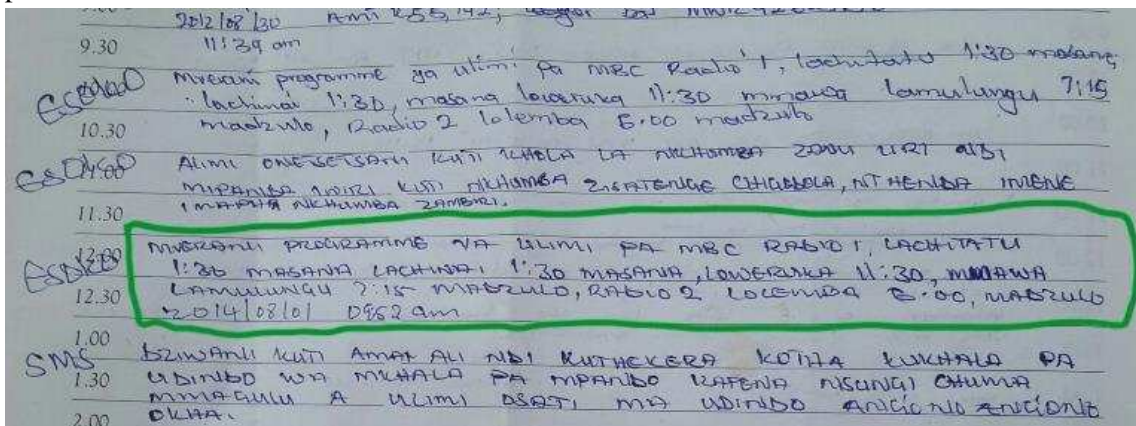


Figure 5: Snapshot of some of the recorded Esoko SMS

Source: Survey, 2014

4.4 ICTs uses

4.4.1 Extent of ICTs uses

To capture the extent to which ICTs are used among respondents the study presented nine different ICTs tools to respondents. These were Radio, TV, Fax Machine, Mobile Phone, CD/DVD/Cassette, Computer, Tablet, Internet and Management Information System (MIS). A four point Likert scale, “very often”, “often”, “rarely” and “never used”, were used to measure respondents’ extent of use on each of the presented tools. Respondents were allowed to add any other tools that they were using. Findings showed that out of all these tool only radio, TV and mobile phones are used among respondents. As shown in Figure 6, radio is leading in terms of usage as 45 (37.5%) respondents indicated to have been using it very often, 33 (27.5%) use it often, 39 (32.5) rarely use it and only 3 (2.5%) respondents indicated to have never used radio to access agricultural information. TV was the next most used tool, where two respondents use it very often, 4 often use it, 22 rarely use it and 92 have never used it. None of the surveyed respondents indicated they use mobile phone very often for agricultural information access. On the other hand, 8 use mobile phones often, 20 rarely use them, and 92 have never used them.

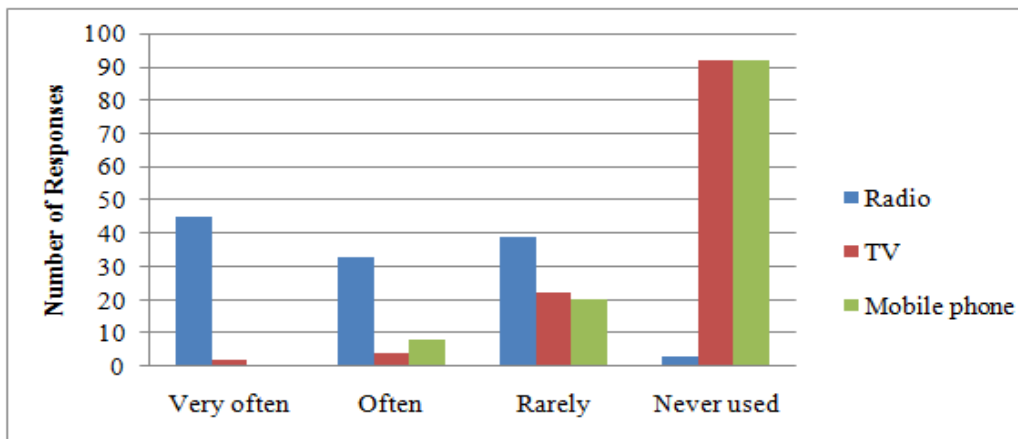


Figure 6: Extent of usages of Radio, TV and Mobile phones

4.4.2 Factors contributing to low extent of ICTs uses

As it has been observed that radio, TV and mobile phones are the only ICTs tools used among respondents to access agricultural information, the study sought to find out why other tools were not used among respondents. Findings showed that most of respondents (48.1%) have never used other tools because those tools are expensive for them to afford buying. Moreover, 24.5% have never used them because they don’t know how to use the tools, 22.7% have never used the tools because they are not available in their places, and 4.6% have never used them because they don’t know how the tools can help them. Findings from interviews with extension officers revealed that lack of enabling infrastructures such as power supply and knowledge to operate ICT tools are also reasons why smallholder farmers do not use the tools.

4.4.3 Perceived advantages of ICTs uses

Respondents’ perceived advantages of using radio, TVs, and mobile phone in their agricultural activities were noted. As Table 4 depicts, various advantages were mentioned. The two advantages mentioned by most of respondents were; easy for agricultural messages to be conveyed (39.1%) and new farming technologies are understood easily (30.5%).

Table 4: Respondents’ perceived advantages of ICTs usages (N=120)

ICTs advantages	Frequency	Percent
We can usually communicate with our friends through phones on problems that are facing an agriculture	8	5.3
New farming technologies are understood easily	46	30.5
Agricultural messages are easily conveyed	59	39.1
We get lessons on postharvest handling	15	9.9
We easily get weather information	14	9.3
We easily get crop market information	9	6.0
Total	151**	100.0

Source: Survey, 2014

** Total Frequency does not add up to 125 because of multiple responses

4.4.3 Assorted ICTs usages

The study observed that radio is the dominating tool that is used among respondents as compared to TV and mobile phones. Many respondents use radio for accessing information on new seed varieties (77 responses), pests/diseases control (77 responses), fertilizer applications (49 responses), weather information (99 responses), postharvest handling (63 responses) and market information (85 responses). Mobile phones are mostly used for communicating with extension officers (10 responses) and record keeping (5 responses). Although at lower rate as compared to radio, TV is mostly used by respondents (15 responses) for accessing weather information. Figure 7 summarizes these findings.

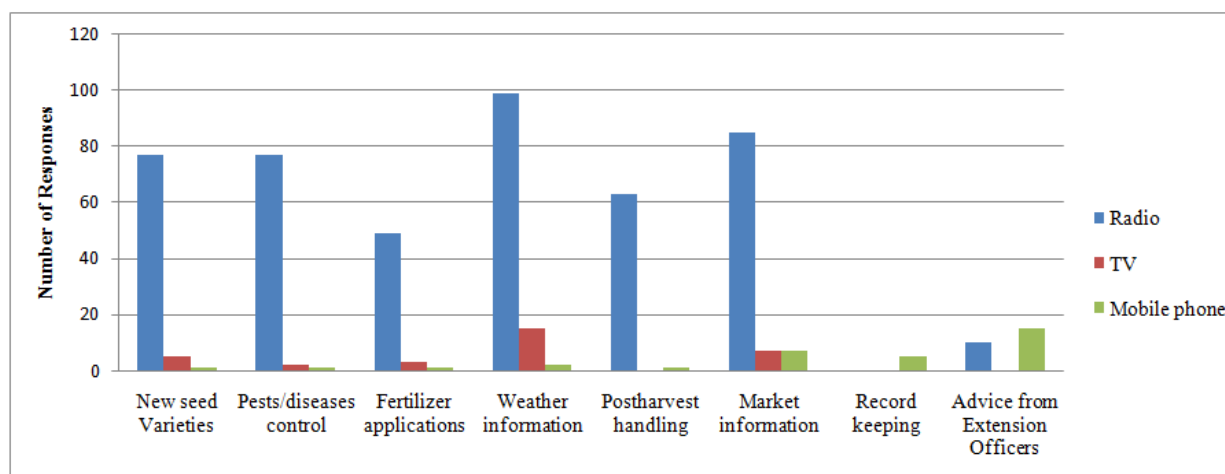


Figure 7: Assorted uses of Radio, TV and Mobile phones

5.0 CONCLUSION AND RECOMMENDATIONS

The empirical evidence of the study shows that the surveyed smallholder farmers have limited access to relevant and accurate information that would help them to make informed decisions concerning production and marketing of their farm produce. This is shown by a significant percentage of respondents who rely on their previous experience or information from fellow farmers to plan and perform several agricultural activities such as pest and disease control, and when to plant crops. Extension workers were a significant source of information for only fertilizer application and postharvest handling of crops.

The study showed further that a small percentage of smallholder farmers access agricultural information through ICTs tools and applications. The main identified reasons being structural and economic constraints.

The study revealed that the factors that affect the choice and use of ICTs tools by the smallholder farmers include high costs of acquiring the tools, illiteracy of smallholder farmers, unavailability of some of the tools, lack of awareness on the importance of ICTs in agriculture, and poor enabling infrastructures.

The study thus recommends the following:

- The Government of Malawi through the relevant ministry should create awareness to smallholder farmers on the importance of accessing agricultural information from credible sources and the opportunities that ICTs offer for timely access to information.
- The Government through the relevant ministries should create an enabling environment for the growth of the ICT industry and scale out the establishment of rural tele-centres.
- Farmer organisations in partnership with ICT service providers should lobby the Government for review of tariffs on ICT products and services for affordability.
- The Government through the relevant ministry should consider provision of free movable agricultural shows and/or documentaries considering that about 80% of the smallholder farmers have either primary or no education, which suggests that literacy level is low.
- The Government through the relevant ministries should promote and monitor use of user-friendly ICT technologies and platforms to help farmers get accurate and reliable information for their agricultural activities and crop markets.

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