



## TYPE OF INFORMATION AND COMMUNICATION TECHNOLOGY TOOLS USED IN DISSEMINATION OF AGRICULTURAL MARKET INFORMATION TO VEGETABLE FARMERS IN VIHIGA COUNTY, KENYA

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### ABSTRACT

In a global view, there are critical challenges facing the vegetable farmers, including poor access to market and poor prices for their vegetables. Vegetable farmers continue to languish in poverty even in this era of information and communication technologies. The purpose of the study was to determine the type of Information and Communication Technology (ICT) tools used in dissemination of agricultural market information to vegetable farmers in Vihiga County, Kenya. Vihiga County was sampled using purposive sampling techniques basing on the livelihood activities and population density. Small scale farmer's households in the county were sampled by multi-stage random sampling. A survey research design was adopted for this study. Here, the natural setting in Vihiga County where vegetable farmers reside provided the required data; the sample size was 589 respondents. Data was collected using questionnaires, interviews and observational checklist to investigate ICT tool used in dissemination of agricultural market information to farmers. Data collected was analyzed using both descriptive and inferential statistics by aid of Statistical Package for social sciences, (SPSS, version 20). The findings of the study reveal the availability of ICT tools such as radios, TV, mobile phones and cyber cafes in the county. The use of ICT in vegetable farming is limited. Radio was the most available tool with majority 135(49.1%) of the respondents reporting to own one. Market information for vegetable farmers remain absent on various ICT platforms. ICT was found to be in most cases statistically significant in influencing dissemination of information among small scale vegetable farming in Vihiga County to those who used i.e. P-value=0.000 at 5% level of significant when subjected to a chi-square. Department of agriculture was found to have offered extension services to farmers through radio announcements. There is need to urgently embrace the Use of other ICT platforms in disseminating agricultural market information to vegetable farmers in Vihiga County, which will enable farmers access to markets price and markets for the products, access input and weather forecast.

**Keywords:** ICT tools, vegetable farmers, Vihiga County, Kenya.

### INTRODUCTION

The agricultural sector has the mainstay of most African economies accounts for about 60% of the total labor force, 20% of the total exports and 71% of the GDP and provides livelihoods to over 70% of the population (ACACIA, 2006). Agricultural information is a key

component in improving small-scale agricultural production and linking increased production to remunerative markets, thus leading to improved rural livelihoods, food security and national economies.

The role of ICT is to enhance food security and support rural livelihoods is increasingly and was officially endorsed at the World Summit on the Information Society (WSIS, 2003). Information and communication technology includes any communication device or application encompassing cellular phones, computer and internet hardware and software, satellite and geographical information systems, as well as various services associated with them such as video conferencing (Techtarget, 2010). Recent studies document widespread application of ICT tools in Agriculture, especially the new generation ICTs such as the Internet, mobile phones and interactive video/CD-ROMs (Munyua, 2008).

The spread of information and communication technologies (ICTs), especially mobile phones, in developing countries has been both extensive and rapid. As of 2008, there were 364 million mobile phone subscriptions in Africa, 460 million in Latin America, and 108 billion in Asia (ITU 2008). Information and communication technologies (ICTs) in particular mobile phones, internet and e-mail are transforming how marketing is carried out in some parts of developing countries including Africa. Examples of internet supported market information system in developing countries, which collect and distribute information about market prices and enable sellers and buyers to contact include: Trade net in West Africa, Esoko in Ghana, and MACE in Malawi, Grameen foundation in India and Router market light in India.

### **STATEMENT OF THE RESEARCH PROBLEM**

Improvement of agricultural productivity will be realized when farmers are linked to market information. In particular, small –scale farmers have poor market infrastructure, inadequate marketing experience, and agricultural inputs (Munyua, 2007). Accurate and timely market information, particularly of perishable items like vegetable, can significantly reduce transaction and travel costs. There have been quite a few studies that explored how ICTs impact livelihoods of vegetable farmers (Rashid and Elder, 2009). Despite this acknowledgement, little is known about the available ICTs for use in market information exchange including the characteristics of both the technology and especially small holder vegetable farmers in Vihiga County. Based on problem stated, the purpose of this study is to investigate the type of tools used in dissemination of agricultural market information to vegetable farmers in Vihiga County, Kenya.

### **STUDY OBJECTIVE**

The main objective of the study was to investigate the type of tools used in dissemination of agricultural market information to vegetable farmers in Vihiga County, Kenya.

### **SCOPE OF THE STUDY**

The study was carried out in Vihiga County one of there are forty seven (47) counties in Kenya. The sample size was 589 vegetable farmers in Vihiga County, Kenya.

## LITERATURE REVIEW

ICTs has been defined as an umbrella term that includes any communication device or application, encompassing radio, television, cellular phones, computer and network hardware and software satellite systems as well as the various services and applications associated with them. (Warren, 2002). According to Grim Shaw (2005), ICTs play a very important role by linking users to update information, skills and market. ICTs offers unprecedented information storage, capacity, increases in processing power and speed coupled with dramatic reduction in costs. ICTs can facilitate the improvement of information management processes by improving ease of access, transparency accountability efficiency, speed of delivery and ease of use, it offers potential for decentralization of information systems, decreasing dependency and empowering the rural poor by devolving control over information and knowledge. (Grim Shaw, 2005).

The cellular phone has provided market links for farmers. In SSA mobile phone have reduced transaction cost, broadened by trade network and facilitated searches for employment Guislair *et al.*, (2006) and Llahiane (2007) notes that mobile phones have revolutionized the way in which farmers' access exchange and manipulate information because they have changed the way farmers interact with markets and cities and they enable farmers to extract current and relevant information critical for decision making.

According to Bertolini (2004), the telephone is the only ICT used by the majority of farmers in Africa the mobile phone technology and especially the SMS are catching up quickly in Africa and the potential technology has been shown by many organizations; the Kenya livestock marketing council, Malawi Agricultural commodity Exchange (MACE) food net of ASSRACA, trade net bit in Western Africa and pride Africa. The rural poor require improved access to information regarding market opportunities and information about their rights and roles and responsibilities of institutions designed to support them. ICTs offer huge potential in support of improved education and training and need to be harness to build long term decision making capacity in rural areas. It can also support improved provisions of short term information required by the rural poor for livelihood strategies. ICTs offer considerable potential to increase the benefits and reduce the opportunity costs of participation.

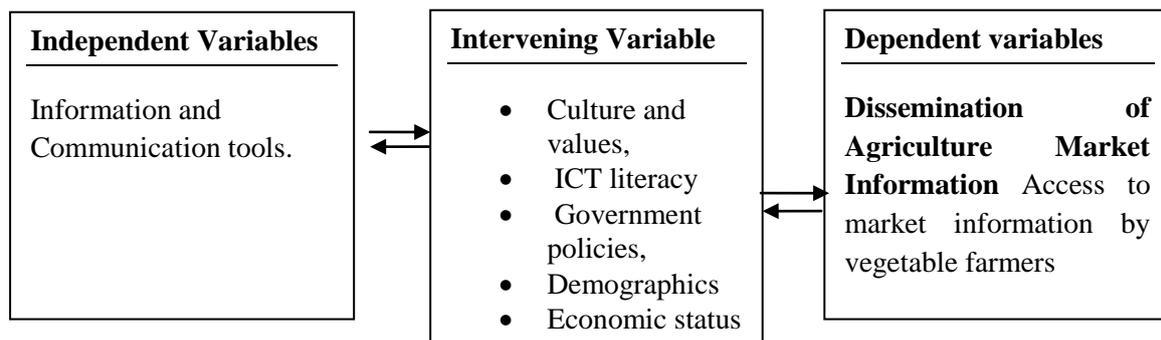
Girard (2003) defined a radio as an important mechanism for disseminating knowledge and information in different languages and formats. Harris (2004) posited that radio has achieved results in the delivery if useful information to the poor people. Frequency modulated (Fm) radio station have become handy tools in small scale agriculture in rural areas and facilitating marketing and disseminating market information. Radio plays the most significant role of any communication technology in the transfer of information in Africa countries since spoken word on broadcast radio is the principal means of information transfer where literacy rates are low(CTA, 2006).

Munyua (2006), suggest that internet and web based applications are becoming increasingly important for sharing and dissemination agriculture information. E-Agriculture is intended to promote the integration of agriculture stakeholder and technology with multimedia, knowledge and culture. And aims to improve communication and learning processes (FAO, 2006).In summary communication technology tend to fall into three categories; radio,

telephone and internet based communication .Latchen et al., (2008) notes that telecentre are now viewed as solution to development because of their ability to provide access to information and ICTs. These technologies have helped in bridging the digital gap between the technologies endowed people and technology starved people. These services including telecommunication, services including telecommunication, internet-mail, and also office equipment including computers, printers, CD-rom and multimedia technology like radio and television which is strategically located to provide access to information through utilizing ICTs

In Kenya and Malawi, e-banking and especially mobile banking is another ICT – based services which has had a tremendous impact on social-economic status of farmers. Through innovative scheme such as M-pesa in Kenya, farmers are able to send and receive money using their mobile phones. Safaricom reported 19 million registered M-pesa users as of December 2014 (ITU-2014). In Kenya, the Kenya agriculture commodity exchange (KACE) collects, update, analyses and provides reliable and timely market information and intelligence on a wide range of crops and livestock commodities, targeting indicators in commodity value chains, with attention to small holder farmers and small agribusinesses(KACE, 2011).

ICTs play a very important role by linking farmers to update information, skills and market. However this is yet to be achieved in Vihiga County. In addition some of these ICTs are not affordable and available to vegetable farmers who are mostly small scale farmers. E.g. GIS application. As much as ICTs play a crucial role in linking farmers to markets, this is not the case in Vihiga County. That is why it would be important to investigate the contribution of ICTs to dissemination of agriculture ICTs to dissemination of agricultural information to vegetable in Vihiga County, Kenya. The following figure shows the conceptual framework that guided the present study. Figure 1 represents a Conceptual framework for contribution of agricultural information to vegetable farmers



**Fig. 1: Conceptual Framework**

(Source: Researcher’s own conceptualization, 2017)

**RESEARCH METHODOLOGY**

A correlational research design was adopted for this study. Here, the natural setting in Vihiga County where vegetable farmers reside provided the required data. Surveys use both structured and unstructured questionnaires or checklists depending on targets and their level of literacy. To analyze the degree of relationship /association between ICTs and

dissemination of agricultural market information to small scale farmers, cross tabulation was used to generate information that was analyzed to provide accurate data to the research questions. It analyzed the association between two or more variables (Orodho, 2003). The study explained the influence of ICTs on dissemination of agricultural market information to smallholder vegetable marketing. The dependent variable is the agricultural market information to vegetable small holder farmers while the independent variable was the types of various ICT tools and their level of utilization which include; mobile phone, telephone, radio, internet among others .

### **Study population and sampling technique**

The sampling procedures used in this study were purposive sampling and multi-stage random sampling for small scale farmers' households. This sampling method is important in getting a representation sample from large areas by counting the variation in each level. This is a sampling method where the entire area is divided into systematic sub areas in descending order of magnitude (Mulusa 1990). A total of 589 farmer's households were used as respondents from the three clusters, Sirwa-Yala, Wamuluma and Masana locations. A purposively selected group of key informants which included extension service providers from the Ministry of Agriculture, Ministry of Cooperatives and Marketing, Agriculture based NGOs, and ICT service providers. A total of 589 households were selected from three locations randomly to be the sample size. In addition 3 NGO officials, 8 ICT service providers and 28 ministry of agricultural extension officers totaling to a sample size of 628 respondents.

### **Data Collection instruments**

The research used questionnaires to collect data from the study respondents. Questionnaires were used in the study because they are convenient to administer when handling large groups of respondents, are confidential, time saving, have no bias and can be utilized to cover wide areas (Mugenda, 2010).

The intention of the research, goals and expected outcomes were stated clearly to guard against rising wrong expectations to the respondents. Both primary and secondary data was collected. Individual and group interview was carried out. Interviews with key informants (MOA, Traders, extension staff, farmers and NGO and ICT service West FM radio station personnel) was conducted to provide an insight into the application of ICTs in the area and give a general view of the decision making process in ICT application in the area. Survey interviews was used to elicit baseline information on what people already know about attitudes, beliefs and future plan for ICT application in agricultural marketing information. Information to be collected included socio-economic characteristics, source of agricultural marketing information, application of ICT tools and their benefits. In addition, information on significance of ICTs was collected at the county level and at the provincial level, including other relevant publications.

### **Research procedure and data analysis**

Statistical package of social sciences (SPSS version 21), was used to analyze data. Data generated by the questionnaires was analyzed using both descriptive and inferential statistics.

Descriptive statistics (Sekaran, 2010) refers to statistics that describe the phenomena of interest. Descriptive statistics involved the use of means, frequencies and percentages and inferential statistics.

## **FINDINGS AND DISCUSSIONS**

The result indicated that of the respondent interviewed for household majority 60% were female respondent while 40% were male counterparts. The result shows that most of the vegetable farmers within Vihiga County were females as compared to males. Analysis on information and communication technology used in dissemination of agricultural markets information was investigated. The respondent was asked whether they were aware of ICT tools that can be used to feed them with information about vegetable farming. Majority 314(53.3%) reported that they had no information about the use of ICT to obtain information. Only 275(46.7) confirmed to have knowledge on ICT that can be used to obtain information. Of those who confirmed to be aware of the ICT tools, 135/275 reported that radio was widely used by vegetable farmers as an ICT tool in dissemination of information. These findings are in agreement with Harris (2004) who posited that radio has achieved results in the delivery of useful information to the poor people. Frequency Modulated (FM) radio station have become handy tools in small scale agriculture in rural areas and facilitating marketing and disseminating market information. Further according to (CTA, 2006) radio plays the most significant role of any communication technology in the transfer of information in Africa countries since spoken word on broadcast radio is the principal means of information transfer where literacy rates are low.

Television was the second highest used ICT tool in obtaining agriculture related information including the vegetable farming. These may be attributed to programs aired on weekly or daily basis concerning farming through programs like shamba shape-up, smart-farm or smart-harvest etc. This results contradicts Bertolini (2004), who argued that the telephone is the only ICT used by the majority of farmers in Africa and that the mobile phone technology and especially the SMS are catching up quickly in Africa and the potential technology has been shown by many organizations; the Kenya livestock marketing council, Malawi Agricultural commodity Exchange (MACE) food net of ASSRACA, trade net bit in Western Africa and pride Africa. Most homestead visited had at least a radio and phone. Very few homes had television sets which were operational. No home visited had computers with internet services connected. The penetration of radio and mobile phones to vegetable farmers was high. The presence of communication booster, and transmission equipment of radio revealed the presence and use of phones and radio in Vihiga County. Their uses were also high but their use to access agricultural market information was either limited or nonexistent. Television set was owned by a few individuals majority of who did not frequently engage in farming of vegetables, those who planted vegetables, did so for domestic consumption. Very few farmers had access to Televisions. There was no sign of or mention of a television broadcasting equipment in the County an indication that the County did not own a televisions station.

A cross tabulation between the type of ICT tool used by public opinion on dissemination of market information was performed to determine the significant influence of ICT tool of

dissemination of market information. The chi-square result revealed that ICT tools used among small scale vegetable farmers had a statistical influence on vegetable farmers in Vihiga County with  $\chi^2_{(12,0.000)}=236.312$  at  $\alpha$  level of significant.

## **CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH**

Radio, mobile phones, television and internet were the available ICT tools used by vegetable farmers. There is need to encourage many farmers to acquire basic education. Secondary and tertiary education is needed to boost the confidence of farmers in acquiring and owning these ICT tools. It is recommended that farmers should regard ICT tools as farming inputs and necessary for ensuring farming is done scientifically. Farmers should seek for capital to purchase the ICT tools which are important in the modern farming. The ministry of agriculture in Vihiga County should progressively offer incentives to farmers so as to embrace technology particularly by providing low cost ICT tools to the farmers. Farmers should also be encouraged to make use of ICT tools available to improve agricultural products. Future research should investigate the influence of ICTs on other products at large scale farming in other counties in Kenya.

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