Original Research Article

The Level of Technology Utilization in the Dissemination of Market Information to Smallholder Vegetable Farmers in Vihiga County

ABSTRACT

Aims: To investigated the level of information and communication technology use in the dissemination of market information to vegetable farmers
Study design: The study used a correlational research design to investigate the relationship between ICT tools and vegetable farmers concerning the dissemination of market information
Place and Duration of Study: Department of Agribusiness and Extension Management (ABE)-Operational, Masinde Muliro University of Science and Technology, between
Institute of Medical Sciences (SIMS), Services Hospital Lahore, between March 2016 and August 2016.
Methodology: We included 568 smallholder vegetable farmers (356 women, 212 men; age range 18-50 years) with ability to produce and sell vegetable on respective local markets. Cross tabulation was administered to generate information about the association between the dependent and independent variables.
Results: The findings indicated the availability of ICT tools such as radios, TV, mobile phones, and cyber cafes in the county. However, the use of ICT in vegetable farming was found to be limited to Radio, with 135(49.1%) of the respondents reporting owning one. This limitation contributed to the absence of market information on other ICT platforms. Still, Chi-square analysis established that ICT use in the dissemination of market information was statistically significant at P-value=0.000, with a 5% level of significance.
Conclusion: There was a positive correlation between ICT use in the dissemination of market information, and improved returns from the sale.

Keywords: Information and communication technology; agriculture market; information dissemination; ICT awareness

1. INTRODUCTION

The agricultural sector has the mainstay of most African economies, accounting for about 60% of the total labor force, 20% of the total exports and 71% of the GDP. It provides livelihoods to over 70% of the population (Aker, 2008). Agricultural information is a key component in improving small-scale vegetable production and linking increased production to remunerative markets, thus leading to improved rural livelihoods, food security and national economies. The role of ICT to enhance food security and support rural livelihoods was officially endorsed at the World Summit on the Information Society (Barret, 2008). Recent studies documented widespread application of ICT tools in Agriculture, especially the new generation ICT such as the Internet, mobile phones and interactive video/CD-ROMs (Munyua, 2008).

According to the Tollens (2006), market data fed directly to farmers via electronic displays boards in 31 centres spread across Ethiopia, as well as on the exchange website. In Kenya, the Kenya Agricultural Commodity Exchange (KACE) collects, updates, analyses and provides reliable and timely market information and intelligence on wide range of crops like vegetables and fruits and livestock commodities, targeting indicators in commodity value chains, with particular attention to small holder farmers and small-scale agribusiness. It facilitates linkages between sellers and buyers of agricultural commodities. Through this service, farmers get competitive and transparent market prices; K.A.C.E uses SMS to disseminate market information via mobile phones (Plyer, G & Haas, 2010).

In Vihiga County, there are various types of ICT, which can be used in dissemination of agricultural market information and prices. However, the big question is whether there has been any impact on access to markets and prices. Therefore, a study on the contribution of ICTs to dissemination of agricultural market information to smallholder vegetable farmers will enable them contribute positively towards ensuring the County achieves MDGs goal no 1 and vision 2030.

The purpose of the study was to investigate the level of information and communication technology use in the dissemination of market information to vegetable farmers. The problem was attributed to lack of access to essential ICT devices, and slow technological adoption in rural areas.

2. METHODOLOGY

The study adopted a correlational research design due to the need to investigate the relationship between ICT tools and vegetable farmers concerning the dissemination of market information. The researcher used structured and unstructured questionnaires, and checklists depending on the participants' level of literacy. Cross tabulation was used to generate information that was to analyze the association between the dependent and independent variables (Orodho,2003). The study explained the level of ICTs in the dissemination of agricultural market information to smallholder vegetable farmers. The dependent variable was the agricultural market information to vegetable smallholder farmers, while the independent variables were the types of various ICT tools and their level of utilization, including mobile phones, telephones, radio, and the internet.

3. RESULTS AND DISCUSSION

3.1 Duration for the usage of ICT tools

The study investigated the duration in which the respondent had used the ICT tool accessed. Table 1 shows the results of the investigation

Table 1. Duration for utilization of ICT tool by small-scale vegetable farmers in Vihiga County, Kenya

Duration For ICT usage	ICT Awareness		**Total**
	Yes	No	
Bellow 1 year	24(8.8)	24(8.1)	**48(8.5)**
Between 1-2 year	22(8.1)	73(24.7)	**95(16.7)**
Between 2-3 year	23(8.5)	70(23.6)	**93(16.4)**
Between 3-4 year	49(18.0)	0(0.0)	**49(8.6)**
Above 5 years	154(56.6)	129(43.6)	**283(49.8)**
Total	**272(100)**	**296(100)**	**568(100)**

The results revealed that 272 farmers were aware of the ICT use in market information dissemination, whereas 296 farmers were not. Out of the 272 farmers, who were aware and had accessed the ICT tools, 154, representing 56.6%, had used the ICT tool for more than 5 years, with radio being the dominant tool. 49 participants, representing 18.0%, had used it between 3-4 years, while 22 participants, representing 8.1%, had used it between 1-2 years.

A cross-tabulation between the ICT tool awareness by the duration showed a significant influence for the duration of ICT usage by ICT awareness $x^2_{(4,\ 0.00)}$ =100.021 at α level of significance. This implies that the duration of ICT usage was influenced by the level of awareness of ICT tools.

Table 2. Influence of duration of ICT usage on the dissemination of market information

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	100.021[a]	4	.000
Likelihood Ratio	121.239	4	.000
Linear-by-Linear Association	23.777	1	.000
N of Valid Cases	568		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 22.99.

The results corroborate the findings of Jera and Ajayi (2008), who, in their study to assess the factors influencing smallholder farmers' decision to adopt fodder bank technology for improving livestock production, the length (years) of household participation in farmer groups was found to positively and significantly relate to the adoption of fodder tree crops promoted by the World Agroforestry Centre. Thus, scaling up such technologies would initially target farmers belonging to such groups.

3.2 The frequency at which ICT tools are used in vegetable farming

The study investigated the frequency at which ICT tools were used. The result showed that out of 272 participants who were aware of ICT tools, 169 participants, representing 62%, had used it often, 68 participants, representing 25%, had used it sometimes, whereas 33 participants, representing 13%, had used it quite often.

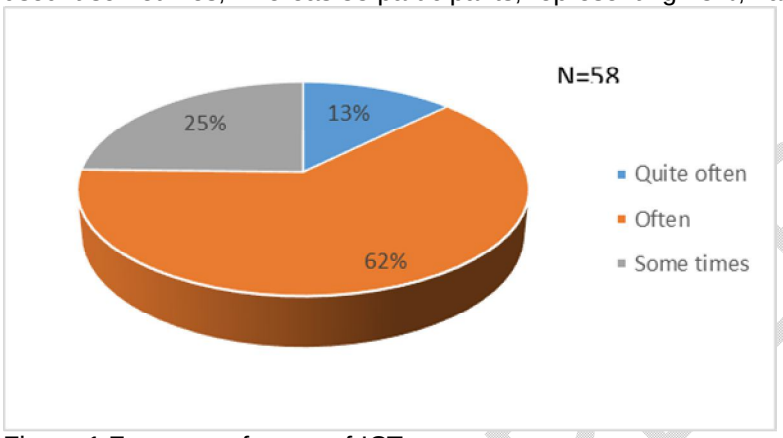

Figure 1 Frequency for use of ICT

Analysis of whether dissemination of market information among small-scale vegetable farmers was significantly influenced by the prolonged use of ICT tools was investigated by performing a cross-tabulation between the duration and public opinion of dissemination of market information. The chi-square analysis revealed that information dissemination was significantly influenced by the continuous use of the ICT tool at α level of significance with $x^2_{(8,\ 0.000)}$=130.756 as shown in Table 3

Table 3. Influence of market information dissemination by the usage of ICT tool in Vihiga County, Kenya

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	130.756[a]	8	.000
Likelihood Ratio	165.320	8	.000
Linear-by-Linear Association	2.382	1	.123
N of Valid Cases	577		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 5.69.

3.3 Level of ICT usage in Vegetable farming

The study investigated the level of ICT usage in vegetable farming and the results were as depicted in Table 4.

Table 4. Level of ICT utilization by small scale Vegetable farmers in Vihiga County, Kenya

Level of Utilization	Frequency	Percent
No Utilization	139	23.6
Low	178	30.2
Moderate	121	20.5
High	127	21.6
Very high	24	4.1
Total	**589**	**100.0**

The results revealed that 178 participants, presenting 30.2% of the respondents reported that the use of ICT within the study area for vegetable farming was low. 139 participants, representing 23.6% reported that there was no utilization of ICT tools in vegetable farming. Only 127 participants, representing 21.6%, reported high utilization of ICT tools in vegetable farming.

The findings indicated that Vegetable farmers in Vihiga County had low utilization of ICT in enhancing their farming and marketing activities. However, this was contrary to Munyua (2006), who suggested that the Internet and web-based applications were important for sharing and disseminating agriculture information. Besides, Chapman and Slaymaker (2002) established that E-Agriculture was intended to promote the integration of agriculture stakeholders and technology with multimedia, knowledge, and culture to improve communication and learning processes.

The use of ICT promised great returns from vegetable farming. Lack of market information caused by low utilization of ICT subjected smallholder vegetable farmers to scarce market information. This was in line with Kiplagat (1999), who posited that dissemination of relevant information to farming communities facilitated the effective adoption of agricultural inputs, decision-making on the market, and adoption of the scientific method.

3.4 Influence of the level of ICT utilization on the dissemination of Market information in Vihiga County, Kenya

A chi-square was performed between the level of ICT Utilization and its influence on public opinion on the dissemination of market information among small-scale vegetable farmers in Vihiga County.

Table 5. Influence of the level of ICT utilization on the dissemination of Market information

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	128.212[a]	16	.000
Likelihood Ratio	165.290	16	.000
Linear-by-Linear Association	19.976	1	.000
N of Valid Cases	586		

a. 3 cells (12.0%) have an expected count of less than 5. The minimum expected count is 1.92.

The result revealed that the level of ICT utilization had a statistically significant influence on the dissemination of market information among small-scale vegetable farmers in Vihiga County with x^2=128.212 and P-value=0.000 at α level of significance. This corresponded with Kenny (2002), who argued that the use of ICT in farming and marketing farm produce was a direct approach to alleviating poverty. Accordingly, the impact of ICT on vegetable farmers in disseminating market information cannot be undermined, thus, needs to be embraced adequately through the provision of incentives to enhance access to the necessary ICT devices for effective communication.

4. CONCLUSION

Radio, mobile phones, television, and the internet were the available ICT tools used by vegetable farmers. The study revealed low utilization of ICT in the dissemination of market information on vegetable produce in Vihiga. Little attention was given to the adoption of ICT in rural areas was considered a factor that contributed to the low utilization of ICT tools. Affordability was another challenge that made farmers not able to access ICT. Thus, the study recommended the use of incentives to resolve the challenge of low ICT utilization by making it possible for smallholder farmers to acquire necessary ICT devices for the realization of enhanced communication.

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