



# **Awareness of Farmers Regarding the Role of Information and Communication Technology in Extension Service Delivery in Roma Valley, Lesotho**

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## **ABSTRACT**

The study assessed awareness of farmers regarding the role of information and communication technology (ICT) in extension service delivery in Roma Valley. The specific objectives were to: describe farmer's knowledge of the role of ICT in extension service delivery; describe farmer's knowledge of the opportunities related to the use of ICT in extension service delivery and identify factors constraining farmer's awareness of the role and opportunities of ICT use in extension service delivery. The study used descriptive quantitative research design and the target population consisted of farmers in eight selected villages in Roma Valley. Systematic random sampling technique was used to select a sample of 80 respondents. Data were collected with the aid of interview schedule and analysed using descriptive statistics in statistical package for social sciences (SPSS). The study revealed that the majority of farmers were knowledgeable of ICT tools especially radio, cell phone and television; and frequently used them. The majority of respondents were knowledgeable of ICT roles and opportunities in extension service delivery and were aware of the factors limiting them from using ICT in extension service delivery. The study recommended the use of ICT tools accompanied with provision of training.

**Keywords:** ICT, awareness, extension, service delivery, Roma valley.

## **INTRODUCTION**

Information and communication technology (ICT) is an intervention with the potential to ensure that knowledge and information on important agricultural technologies, methods and practices are put in right use by farmers. The ICT consists of various collections of resources and technical tools that can be used for collecting, spreading, storing and managing information (Ezeh, 2013). The ICTs include mobile phones, innovative communicating radio and television programmes, farmers call centres, video-conferencing, offline multimedia CDs and open distance learning. These can help expand outreach to a large number of farmers. According to Kirui *et al.* (2012), high awareness of mobile phone-based money transfer services among the smallholder farmers in Kenya has led to predominant use of remitted funds for agricultural related purposes. The ICT as the biggest factor for change in extension services plays an important roles in enhancing agricultural extension administration, such as helping in producing knowledgeable and well informed farming communities, individuals and collectively through diagnosing problems, interpreting data and applying their meanings. The application of ICTs can increase farmers' production capabilities and allow them to access timely information from extension workers in order to sustain their farming activities (Ajani, 2014).

Aker (2011) stated that ICTs play numerous roles in extension service delivery. These include helping in expanding outreach to a large number of farmers; offering a solution to resource and capacity issues

within the agricultural sector; improving information flow and connecting people within the rural areas; answering questions relating to farm problems with the advantage of getting feedback using mobile phones, for example; and obtaining market price and weather forecasts.

In India, the level of the percentage of production and marketing information obtained from ICT sources had positive significant influence on the farmers' access to marketing and production information (Parmar et al., 2019). The awareness of farmers on delivery of farm information through ICT is also positive and encouraging. Furthermore, Tata and McNamara (2016) stated that ICT serves as a major catalyst for information, knowledge and development opportunities.

In spite of successful research on new agricultural practices, the majority of farmers are not getting upper bound yield because there is growing recognition that farmers in Roma Valley have information needs and appropriate learning methods that are not being met. Despite the availability of ICTs tools that provide diverse opportunities for farmers to communicate agricultural information, communication in Roma Valley is highly dependent on direct face- to-face interaction where farmers usually wait for extension workers to bring information. However, this takes a long time to the extent that farmers get out-dated messages and, sometimes delay to begin farming operations, hence, lag behind the growing season. This has led to the study to assess the awareness of farmers regarding the role of ICT in extension service delivery. The specific objectives were to:

- i. describe farmers' knowledge and use of ICT tools
- ii. determine farmers' knowledge of the role of ICT in extension service delivery.
- iii. determine farmers' knowledge of the opportunities related to the use of ICT in extension service delivery.
- iv. identify factors constraining farmers' awareness of the role and opportunities of ICT use in extension service delivery.

## **METHODOLOGY**

The study used a descriptive quantitative research design, where quantifiable data were collected and subjected to descriptive statistic analysis. The target population was farmers in eight selected villages in Roma Valley which were distributed as follows: Ha Mafefooane (401), Hata-butle (767), Mafikeng (392), Mangopeng (305), Thoteng (401), Pae-lea-itlhatsa (333), Maphotong (290) and Khobeng (473). Systematic random sampling technique was employed and a proportionate sample of 80 was selected for the study. The study used an interview schedule where questions were developed from information derived from literature review. Three experts from the Department of Agricultural Economics and Extension in the Faculty of Agriculture and Faculty of Science and Technology, National University of Lesotho, checked the validity of items in the interview schedule. Their views and suggestions were incorporated in the final instrument that was eventually used to collect data. The instrument was considered content-valid. A total of 15 farmers in Tloutle whose results were not included in the study were interviewed to test for reliability of the instrument and Cronbach's Alpha was used to compute reliability coefficient. A coefficient value of 0.84 was obtained, indicating that the instrument was reliable. Face-to-face interviews were used to collect data which were then subjected to descriptive statistics for analysis.

## **FINDINGS AND DISCUSSION**

### **Farmers' Knowledge of ICT tools**

Farmers' knowledge of the role of ICT in extension service delivery was examined in the context of: knowledge of ICT tools and knowledge of farmers of the role of ICT in extension service delivery. The findings on the farmers' knowledge of ICT tools are shown in Table 3.

The findings reveal that respondents were knowledgeable only with regard to the following ICT tools: Radio (99%); Cell phone (86%) and Television (82%). However, the findings also reveal that respondents were generally not knowledgeable regarding the following ICT tools: Smart phone (49%); Internet (30%); Tablet (28%); Newspaper (24%); Video conferencing (8%); Offline multimedia CD (8%) and Web portal

(7%). The fact that majority of farmers were knowledgeable about radio, cell phone and television is a reflection of the increasing penetration of these tools among the rural population and the prospect that, if appropriately used, they can offer huge scope for development in rural areas (Syiem and Raj, 2015). However, few farmers use internet, tablet, web portal, offline multimedia CD and video conferencing. These tools are more used by emerging young and educated farmers and are expensive. Although only 49% of respondents were knowledgeable of smart phones, this trend is encouraging and reflects good progress. The low ratings of newspapers reflect the fact that most papers in Lesotho are weekly rather than daily editions and do not quite focus on agriculture.

**Table 1: Distribution of respondents' knowledge of ICT tools**

| Knowledge of ICT tools | Yes (%) | No (%) |
|------------------------|---------|--------|
| Radio                  | 98.7    | 1.30   |
| Television             | 81.6    | 18.4   |
| Web portal             | 6.60    | 93.4   |
| Smart phone            | 48.7    | 51.3   |
| Newspaper              | 23.7    | 76.3   |
| Cell phone             | 85.5    | 13.2   |
| Internet               | 30.3    | 69.7   |
| Tablet                 | 27.6    | 72.4   |
| Video conferencing     | 7.90    | 92.1   |
| Offline multimedia CD  | 7.90    | 92.1   |

#### **Use of ICT**

According to the findings in Table 2, farmers in Roma Valley mostly used radio (92.1%), cell phone (75%) and television (67.1%) to access agricultural information from experts or extension personnel. The use of radio was rated highly, possibly because of its large coverage in the country and that broadcasting to the audience was in local language. The increasing use of cell phones and television reflects expansion of extension opportunities for farmers in Roma Valley. These findings are in line with the views of Mabe and Oladele (2015) that extension officers attached importance to mobile phones, fax machines, the Internet and computers, these devices are sources of technological information and innovation and means of dissemination of this information.

**Table 2: Distribution of respondents by use of ICT**

| Use of ICT tools | Yes (%) | No (%) |
|------------------|---------|--------|
| Radio            | 92.1    | 7.90   |
| Television       | 67.1    | 32.9   |
| Smart phone      | 38.2    | 61.8   |
| Cell phone       | 75.0    | 25.0   |
| Internet         | 28.9    | 71.1   |

#### **Knowledge of farmers regarding the role of ICT in extension service delivery**

The study investigated the knowledge of farmers regarding the role of ICT in extension service delivery. A six-point Likert-type scale anchored as follows: 1 = Strongly agree, 2 = Slightly agree, 3 = Agree, 4 = Disagree, 5 = Slightly disagree, 6 = Strongly disagree was used. For purposes of interpretation of the findings that were based on means less than 3.5 were taken to imply possession of knowledge of the role of ICT, while those from 3.5 and above were taken to imply lack of knowledge. Furthermore, standard deviations of less than 1.000 were interpreted to imply that there was no variation in respondents' opinions, while those from 1.000 and above were taken to imply that the respondents varied in opinions. The findings, as presented in Table 3, reveal that the majority of respondents were knowledgeable about the roles of ICT since the overall mean was 2.35. The overall standard deviation was 1.110, which

denotes variation of opinions among the majority of respondents. Specifically, the respondents were knowledgeable of the following roles of ICT: Provides updated information (mean = 1.64), provides timely information (mean = 1.66), reaches more people with easy access (mean = 1.67), provides relevant information (mean = 1.76), allows transparent storage of information (mean = 1.89), allows efficiency of information (Mean = 2.09), provides immediate access to information (Mean = 2.17), empowers farming communities (Mean = 2.25), improves learning process (Mean = 2.26), increase efficiency of market interaction (Mean = 2.58), promotes collaboration among farmers (Mean = 2.82).

**Table 3: Distribution of respondents by opinions in the role of ICT in extension service delivery (n = 76)**

| <b>Opinions on the roles of ICT in service delivery</b> | <b>Mean</b> | <b>SD</b> |
|---|-------------|-----------|
| Provides immediate access to information                | 2.17        | 1.159     |
| Provides access to credit                               | 3.66        | 1.381     |
| Increases efficiency of market interaction              | 2.58        | 1.257     |
| Promotes collaboration among farmers                    | 2.82        | 1.067     |
| Provides relevant information                           | 1.76        | 1.165     |
| Allows efficiency of information                        | 2.09        | 1.307     |
| Improves learning process                               | 2.26        | 1.360     |
| Improve adoption of agricultural technologies           | 3.75        | 1.245     |
| Empowers farming communities                            | 2.25        | 1.248     |
| Reaches more people with easy access                    | 1.67        | 1.159     |
| Provides timely information                             | 1.66        | 1.138     |
| Provides updated information                            | 1.64        | 1.128     |
| Allows transparent storage of information               | 1.89        | 1.184     |
| Overall   | 2.35        | 1.110     |

The findings indicate that respondents were generally aware that ICT provides timely, updated and relevant information and reaches more people with easy access, especially through the use of radio. These findings are in agreement with those of Ezeh (2013) who reported highest awareness of radio (98%), followed by television (62%), media van (33%), print (31%) and projector (23%).

However, the respondents were not knowledgeable of the fact that ICT provides access to credit and improves adoption of agricultural technologies. This implies that there is low awareness of these roles, hence more awareness is required.

#### **Farmers' Knowledge of Opportunities of ICT in Extension Service Delivery**

The study investigated the knowledge of farmers regarding ICT opportunities in extension service delivery. The findings were interpreted in a similar manner as described above and the findings are shown in Table 4.

Majority of respondents were knowledgeable of most of ICT opportunities. The most notable opportunities include provision of complete information (mean = 1.59), quick and easy access to information (mean = 1.6) and efficient delivery of information (mean = 1.83). According to these findings, the level of awareness of farmers on delivery of agricultural information through ICT is positive and encouraging. Hence, the existing opportunities should be utilized to enhance extension service delivery. However, respondents were not knowledgeable of receiving payments and purchasing farm inputs electronically (mean = 4.11). This implies that more awareness of these opportunities is required to enhance the level of utilization of ICTs by farmers.

**Table 4: Distribution of respondents by knowledge of ICT opportunities (n = 76)**

| <b>ICT opportunities</b>                              | <b>Mean</b> | <b>SD</b> |
|---|-------------|-----------|
| Provides quick and easy access to information         | 1.66        | 1.510     |
| Expands market base                                   | 2.39        | 1.424     |
| Provides complete information                         | 1.59        | 1.489     |
| Provides efficient delivery of information            | 1.83        | 1.554     |
| Increases productivity                                | 2.74        | 1.258     |
| Provides distant learning and training                | 2.25        | 1.509     |
| Allows farmers to receive payments electronically     | 4.05        | 1.355     |
| Allows farmers to purchase farm inputs electronically | 4.11        | 1.312     |
| Assists with business planning                        | 3.33        | 1.427     |
| Enhances employment creation                          | 2.96        | 1.290     |
| Provides accurate information                         | 2.87        | 1.279     |
| Provides reliable information                         | 2.83        | 1.310     |
| Overall   | 2.48        | 1.290     |

#### **Factors Limiting Farmers' Use of ICT in Extension Service Delivery**

The respondents were requested to indicate their opinions regarding factors that limit them from using ICT in accessing agricultural information. The findings are summarised in Table 5. Specifically, respondents were of the view that only the following were limiting factors:

- i. Lack of financial resources (96%);
- ii. High cost of ICT tools (93%).

Lack of financial resource in using ICT was rated the highest (96%), followed by, high cost of ICT tools (93%). According to these findings, the lack of financial resources, coupled with the high cost of ICT gadgets makes it difficult to adopt the use of such tools. According to Siraj (2010), extension workers in Pakistan cited the main limiting factors as lack of appropriate incentives, low level of recognition, high transportation cost and inadequate budgets, inadequate technology training, lack of affordable system of communication with the farmers, and lack of training in communication skills and social mobilization techniques. Despite the fact that ICT has immense potential in disseminating agricultural knowledge and information, the above-mentioned challenges are perceived to have limited the use of ICT. As a result, research-extension-farmers linkages are weak and costly as such linkages have to be fostered through physical contact, such as field demonstration. Similar discovery was made by Akintunde and Oladele (2019) among public and private extension officers in Lesotho who perceived high cost of parts of ICT tools or maintenance as a barrier to their adoption.

**Table 5: Distribution of respondents by factors limiting the use of ICT**

| <b>Factors limiting the use of ICT</b>   | <b>Yes (%)</b> | <b>No (%)</b> |
|--|----------------|---------------|
| Illiteracy                               | 11.8           | 88.2          |
| Lack of electricity                      | 15.8           | 84.2          |
| Lack of skill in using ICT               | 9.20           | 90.8          |
| Lack of infrastructure                   | 1.30           | 98.7          |
| Lack of financial resources              | 96.1           | 3.90          |
| High cost of ICT tools                   | 93.4           | 6.60          |
| High cost of maintenance                 | 25.0           | 75.0          |
| High cost of internet access             | 18.4           | 81.6          |
| Limited network connectivity             | 15.8           | 84.2          |
| Lack of awareness of the benefits of ICT | 7.90           | 92.1          |

## CONCLUSION AND RECOMMENDATION

Farmers in Roma Valley are knowledgeable of selected ICT tools and frequently use them. They are not only aware of the role of ICT in extension service delivery but are also knowledgeable of ICT opportunities in extension service delivery in their area. Farmers in Roma Valley are aware of the factors limiting them from using ICT in extension service delivery. Thus, it can be concluded that farmers in the valley generally know ICT tools and their roles in extension service delivery.

Given that farmers in Roma Valley are aware of the roles and opportunities of ICT in extension service delivery, especially radio, cell phone and television. It is recommended that the Department of Field Services (DFS) and Faculty of Agriculture should encourage the use of these tools. The ICT training programmes for extension workers and farmers have to be put in place by the two stakeholders in order to revolutionize extension service delivery in Roma Valley and possibly beyond.

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