

Original Research Article

Assessment of the Potential for Introduction of Mobile Phone-Based Agricultural Extension Service in Roma Valley, Lesotho

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Abstract

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The study examined the potential for introduction of mobile phone-based extension services delivery in Roma Valley. The specific objectives were to: assess farmers' access to and use of mobile phones for extension service delivery, assess the willingness of farmers to use mobile phones for extension service delivery and identify the factors which may constrain the use of mobile phones for extension service delivery in Roma valley. The study used quantitative research design and the target population was households in Liphehleng, Hata-Butle, Mafikeng, Pae-La-Itlhatsoa, Mangopeng and Ha- Mafefooane in Roma valley. Systematic random sampling technique was used to select 60 respondents. Data were analysed descriptively using frequencies, percentages, means and standard deviations as statistical indicators using the Statistical Package for Social Sciences (SPSS). The study revealed that majority of respondents had no access to ICT tools, particularly mobile phones, although they were aware of the contribution of mobile phones as sources of agricultural information and, hence, generally willing to use them for extension service delivery. Also, respondents were aware of the factors known to be promoting or constraining the use of mobile phones in extension service delivery.

Keywords: ICT, mobile phones

INTRODUCTION

Mobile phones are widely recognised as a potentially transformative technology platform for developing countries such as Lesotho. They are considered important for development as they offer mobility, security to owners and, due to their characteristics of using radio spectrum, they need not rely on physical infrastructure, such as roads and phone wires. According to Mittal and Tripathi (2009), telecommunications, especially mobile phones have the potential to provide solution to the existing information asymmetry in various lagging sectors like agriculture.

Rapid growth of mobile phones and the introduction of mobile-enabled information services provide ways to

improve information dissemination to farmers and helps overcome information asymmetry existing among groups of farmers (Mittal and Mehar, 2012). Mobile phone-based extension service delivery also helps, at least partially, to bridge the gap between delivery of agricultural inputs and agricultural education. They also require basic literacy to use and therefore, can be accessible to a relatively large portion of the population, especially in rural areas like Roma Valley. Rashid and Elder (2009) stated that mobile telephony is the predominant mode of communication in the developing world, especially in Africa as one in five Africans now own a mobile phone.

Knowledge and information have become the major

drivers of social and economic transformation in the world. They are now as important as, if not more, a factor in development, and this trend is set to intensify (United Nations Development Programme (UNDP), 2015). Agricultural extension and education can play a critical role in the transformation process, transferring technology, supporting learning, assisting farmers in problem-solving and enabling them to become more actively embedded in the agricultural knowledge and information system.

According to Dire *et al.* (2016), poor awareness or exposure of farmers to appropriate agricultural information and channels of communicating this information, such as mobile phones, is one of the major reasons for low yield as well as poor performance of agricultural extension agents. For human performance to be effective and efficient some knowledge is needed on how, why and when certain things have to be done. Major constraints faced by farmers in rural areas include lack of confidence in operating mobile phone applications due to less exposure and lack of awareness on how to properly use information communication technologies (ICT) in order to derive their benefits (Syiem and Raj, 2015). Moreover, difficulty in charging mobile phones due to erratic and fluctuating power supply hinders most of the farmers from using ICTs for development.

The majority of farmers in Roma Valley are subsistence farmers who depend entirely on agricultural information from extension workers. However, there is a high shortage of extension staff in Roma Valley, which leads to a low ratio of extension workers to farmers and that hinders the effective delivery of extension services in the area. While agricultural education is expected to play a major role in the transfer of technology, supporting learning and assisting farmers in problem-solving hence helping them become more embedded in the agricultural knowledge and information systems, the situation is different in Roma valley. Due to poor infrastructure, some villages in Roma valley such as Tloutle, are not easily accessible and that leads to decreased chances of face-to-face interaction between farmers and extension personnel.

In most parts of Roma Valley and other rural areas in Lesotho, women, old people and elderly people are the ones who are mainly engaged in agricultural activities. This is a major problem as they seldom attend workshops and meetings conducted by extension workers due to other household commitments and their age. In addition, due to lack of funds, they are unable to travel to the nearby resource centre in Masianokeng for extension consultations.

This has led to the study seeking to examine the potential for introduction of mobile phone-based delivery of extension messages in Roma Valley. The specific objectives were:

i. To assess farmers' access to and use of mobile phones for extension service delivery.

ii. To assess farmers' willingness to use mobile phones to access extension messages.

iii. To identify factors that can promote or constrain the use of mobile phones for extension service delivery.

MATERIALS AND METHODS

Research Design

Quantitative research design was used in this study through which quantifiable data were collected, analysed through statistics and presented in a numerical form.

Population of the Study and Sampling

The target population were farmers in six Roma villages were distributed as follows: Mafikeng (29), Hata-Butle (17), Pae-la-Itlhatsoa (10), Liphehleng (26), Ha-Mafefooane (40) as well as Mangopeng (20). Systematic random sampling was used because it was easy to use, could be done manually and there was assurance that the population would be evenly sampled. Sixty farmers was involved in the study which accounted for more than forty two percent of the entire farming community.

Instrumentation

The interview schedule which entailed close-ended questions was used and it was developed for the purpose based on information from literature review.

Validity

Three lecturers, one each from the Faculty of Agriculture, Faculty of Social Sciences and Faculty of Science and Technology reviewed the interview schedule and their views and suggestions were incorporated in the final instrument which was used to collect data.

Reliability

A total of 15 farmers in Tloutle and Sekhutlong were interviewed to test for reliability of the instrument. Chronbach' Alpha formula was used to calculate the reliability coefficient, which was 0.73 showing that the instrument used was reliable. The pre-test farmers were not used in the actual research.

Data Collection

Face-to-face interviews were used to collect data and

were conducted by the researcher. Respondents were visited on pre-arranged dates and times.

Data Analysis

Data were descriptively analysed using the Statistical Package for Social Sciences (SPSS) computer programme version 20.0 whereby statistical indicators included frequencies, percentages, means and standard deviations. This analytical technique and tool were used by Mojaki, R and Keregero, K. J. B (2017) in their assessment of the potential for use of ICT in agricultural industry of Lesotho (Okello-Uma *et al.*, 2009). The total, frequencies and averages were calculated and presented in graphical form.

RESULTS AND DISCUSSION

Demographic Characteristics

Demographic characteristics which were studied were sex and age of the respondents and the findings are presented in Table 1.

Table 1. Distribution of respondents by demographic characteristics

Demographic Characteristics	Frequency	Percentage
Gender		
Male	28	46.7
Female	32	53.3
Total	60	100.0
Age of respondents		
Below 25 Years	16	26.7
25-35 Years	18	30.0
36-45 Years	14	23.3
Above 45 Years	12	20.0
Total	60	100.0

Farmers’ Access to and Use of Mobile Phones and Other ICT Tools

The respondents were requested to indicate their access to and use of mobile phones. For purposes of interpretation of the findings, percentages of 50 and above were taken to imply accessibility and those below 50 to imply inaccessibility. The findings on farmers’ access to mobile phones are presented in Table 2.

Table 2. Distribution of respondents by access to mobile phones and other ICT Tools

Farmers’ Access	Yes (%)	No (%)
Cell phone	31.7	68.3
Smart phone	45.0	55.0
Tablet	10.0	90.0
None	13.3	86.7

The findings generally show that the majority of farmers had no access to ICT tools. However, it should be mentioned that with only 45% having access to smart phone, 32% having access to mobile phone and 10% having access to a tablet, it is evident that community members are gradually adopting the tools that will, ultimately contribute towards effective extension if used for the purpose. That is, these statistics, though low, point to the emerging positive image of subsistence farmers slowly adapting to the modern world of technology. This implies a growing potential that they can use these gadgets for extension service delivery. The findings are in line with those by Mittal and Mehar (2012) who revealed that 40% of farmers in their study area owned a mobile phone.

Table 3 presents findings on the distribution of respondents by use of mobile phones. They reveal that the majority of respondents who had access to mobile phones used them for: sending and receiving SMSs (87%), making and receiving calls (85%), using the clock (80%) and checking the calendar (77%). Other uses were: playing games (62%), listening to music (60%), taking pictures (60%), listening to agricultural programmes on radio (58%), social media (53%) and internet (53%). It is clear from the findings that respondents generally used mobile phones for a variety of purposes including listening to agricultural programmes on radio as well as checking the weather forecast (47%) both of which are of interest in agricultural extension.

In a study conducted in Delta State in Nigeria, only 30% of the respondents used their mobile phones for accessing weather forecast (Egbule *et al.*, 2013), compared to 47% of respondents checking the weather forecast using their mobile phones in Roma valley which is higher and of advantage to agricultural extension. Also, the proportion of respondents listening to agricultural programmes on radio (58%) is noteworthy in the sense that these respondents have taken radio-listening to another level by utilizing their mobile phones. The implication is that mobile phones can be used effectively as an outlet for radio messages of extension interest.

Willingness of Farmers to Use Mobile Phone for Extension Service Delivery

The study sought to determine the willingness of respondents to use mobile phones for extension service delivery in Roma valley. This was done by seeking their level of agreement with selected opinions using a six-point Likert-type scale anchored as follows: Strongly disagree = 1, Disagree = 2, Slightly disagree = 3, Slightly agree = 4, Agree = 5 and Strongly agree = 6. For purposes of interpretation of findings, means of 3.50 and above were taken to imply agreement while those below 3.50 were taken to imply disagreement. In addition,

Table 3. Distribution of respondents by use of mobile phones

Farmers' Use of Mobile Phones	Yes (%)	No (%)
Internet	53.3	46.7
Social Media	55.0	45.0
Making and receiving calls	85.0	15.0
Sending and receiving SMS	86.7	13.3
Listening to agricultural programmes on radio	58.3	41.7
Checking the weather forecast	46.7	53.3
Checking the calendar	76.7	23.3
Taking pictures	60.0	40.0
Listening to music	60.0	40.0
Using the clock	80.0	20.0
Playing games	61.7	38.3

Table 4. Distribution of respondents by willingness to use mobile phones for extension (n = 60)

Selected opinions regarding the use of mobile phones	Mean	SD
Mobile Phones can be a useful source of Agricultural Information	4.72	1.698
Agricultural Telecentres can be a useful source of Agricultural Information	4.02	1.546
Agricultural Radio Programmes provide sufficient Agricultural Information	4.07	1.561
Radio Programmes have positive effect on agricultural production	4.13	1.455
Mobile Phones Increase speed of feedback from extension workers	4.57	1.294
Mobile Phones will make extension service more cost-effective	4.52	1.172
Mobile Phones will increase the pace of rural development	4.58	1.306
Mobile Phones will enhance sustainable rural livelihoods	4.48	1.347
Mobile Phones are difficult to use	3.03	1.667
Messages sent through Mobile Phones are clear	4.25	1.398
Mobile Phones can help improve agricultural productivity	4.28	1.552
Overall	3.82	1.45

standard deviation of 1.000 or below was interpreted to imply close similarities in opinion among respondents, and those above 1.000 to imply variation in opinion.

The findings, as shown in Table 4, indicate that respondents in Roma Valley were generally willing to use mobile phones for extension service delivery, as their means ranged from 3.03 to 4.72 with the overall mean being 3.82. The standard deviations ranged from 1.172 to 1.698 with the overall of 1.450 which shows that there was variation in the opinions given by the respondents.

Specifically, respondents agreed with the following opinions regarding the use of mobile phones that reflect their willingness to use them:

i. Mobile phones can be a useful source of agricultural information (Mean = 4.72)

ii. Using mobile phones will increase the pace of rural development (Mean = 4.58)

iii. Using mobile phones improves speed of feedback from extension workers (Mean = 4.57)

iv. Using mobile phones will make extension service more cost-effective (Mean = 4.52)

i. Using mobile phones will enhance sustainable rural livelihoods (Mean = 4.48);

ii. Mobile phones can help improve agricultural productivity (Mean = 4.28);

iii. Messages sent through mobile phones are clear (Mean = 4.25);

iv. Radio programmes have positive effect on agricultural production (Mean = 4.13);

v. Agricultural radio programmes provide sufficient agricultural information (Mean = 4.07);

vi. Agricultural tele-centres can be a useful source of agricultural information (Mean = 4.02).

It is clear from the findings that respondents were very much aware of the contribution of mobile phones as a source of agricultural information that has a role to play in efforts to improve agricultural productivity.

These findings are in line with those of Bolarinwa and Oyeyinka (2011) that using mobile phones will increase the availability of agricultural information to the farmers. However, the respondents disagreed with the opinion that mobile phones are difficult to use (Mean = 3.03). This further re-inforces the findings that they were actually willing to use mobile phones as they saw no difficulties in doing so.

Table 5. Distribution of factors promoting the use of mobile phone for extension

Factors that can promote the use of mobile phones for extension service delivery	Yes (%)	No (%)
Availability of extension personnel	86.7	13.3
Investment in agricultural telecentres by government	80.0	20.0
Availability of farmers' workshops on the use of mobile phones for extension	78.3	21.7
Access to affordable equipment for extension staff telecentres	80.0	20.0
Easy access to research information	86.7	13.3
Ability of agricultural institutions to produce digital agricultural content	81.7	18.3
Re-training of extension staff in mobile phone-mediated extension	86.7	13.3
Investment in infrastructure e.g connectivity	90.0	10.0
Access to affordable mobile phones to farmers	86.7	13.3
Access to agricultural extension messages on time	85.0	15.0

Table 6. Distribution of constraints to the use of mobile phones by farmers

Constraints to the use of Mobile Phones by farmers	Yes (%)	No (%)
Inadequate language proficiency in the use of mobile phones Mobile phone illiteracy among farmers	55.0	45.0
Poor network coverage	53.3	46.7
Resistance by extension workers who see mobile phones as a threat to job security	70.0	30.0
Lack of awareness by farmers on how mobile phones can be used in extension	88.3	11.7
Inability of farmers and extension staff to use some applications	86.7	13.3
Complexity of messages communicated through mobile phones	86.7	13.3
Unavailability of power for charging mobile phone batteries	85.0	15.0
Lack of skills to operate mobile phones	81.7	18.3
Inadequate digital content relating to agricultural extension	78.3	21.7
	86.7	13.3

Factors Promoting and Constraining the Use of Mobile Phones for Extension Service Delivery

The study investigated some of the factors that can promote the use of mobile phones for extension service delivery in Roma Valley. This was done by requesting respondents to indicate whether or not they agreed with selected factors and the findings are summarised in Table 5.

The findings indicate that respondents agreed with all selected items. Specifically, they agreed that the following were factors promoting the use of mobile phones for extension service delivery:

- i. Investment in infrastructure e.g. network connectivity (90%);
- ii. Access to affordable mobile phones to farmers (87%);
- iii. Re-training of all extension staff in mobile phone-mediated extension (87%);
- iv. Availability of trained extension personnel (87%);
- v. Easy access to research information (87%);
- vi. Access to agricultural extension messages on time (85%);
- vii. Ability of agricultural institutions to produce digital agricultural content (82%);
- viii. Investment in agriculture tele-centres by government (80%);

ix. Access to affordable equipment for extension staff at tele-centres (80%);

x. Availability of farmers' workshops on the use of mobile phones for extension (78%).

These findings generally reveal that respondents are very much aware of the factors known to be promoting the use of mobile phones in extension service delivery. This understanding is very important as it will enable farmers to utilise such promoters to their advantage in order to improve the effectiveness of extension service delivery. The findings also provide evidence to policy makers on what ought to be strengthened or enhanced to ensure that a conducive environment for extension service delivery using mobile phones is created in Roma valley and beyond.

Factors Likely to Constrain the Use of Mobile Phones for Extension Service Delivery

The study also focused on some of the factors that may serve as obstacles to the use of mobile phones for extension service delivery as seen by respondents. Table 6 summarises the findings reflecting respondents' opinions.

It is evident that respondents agreed that all the selected items constituted factors constraining the use of

mobile phones for extension service delivery. These are:

- i. Resistance by extension workers who see mobile phones as a threat to job security (88%)
- ii. Inadequate digital content relating to agricultural extension (87%)
- iii. Inability of farmers and extension staff to use some applications (87%)
- iv. Lack of awareness by farmers on how mobile phones can be used in extension (87%)
- v. Complexity of messages communicated through mobile phones (85%)
- vi. Unavailability of power for charging mobile phone batteries (82%)
- vii. Lack of skills to operate mobile phones (78%)
- viii. Poor network coverage (70%)
- ix. Inadequate language proficiency in the use of mobile phones (55%)
- x. Mobile phone illiteracy among farmers (53%)

These findings clearly indicate that respondents are aware of the constraining factors to extension service delivery by mobile phones. This awareness is potentially useful in efforts to involve farmers in alleviating such factors. The findings also provide evidence to policy makers on what ought to be done to eliminate the constraints and ensure that a conducive environment for extension service delivery using mobile phones is created in Roma valley and beyond. Chhachar and Hasan (2013) also indicated that farmers are aware that their illiteracy is one of the factors that cause limited use of ICTs as they are unable to contact relevant officers and departments to get information, market prices and weather forecast.

CONCLUSION

The majority of respondents had no access to ICT tools, particularly mobile phones and the few who had mobile phones used them for sending and receiving SMSs. There is awareness of the contribution of mobile phones as sources of agricultural information among the respondents and they generally willing to use them for extension service delivery. The majority of respondents were aware of the factors known to be promoting and constraining the use of mobile phones in extension service delivery. It is concluded that Farmers in Roma Valley have limited access to ICT although are aware of the contribution of mobile phones as a source of agricultural information and are willing to use them for extension service delivery. The Roma Valley farming community is aware of the promoters and constraints to the use of mobile phones in extension service delivery.

RECOMMENDATIONS

In light of lack of access to ICT tools, the Faculty of Agriculture and Department of Field Services should

sensitize farmers on the need to have access to these tools in extension work. The Faculty of Agriculture and Department of Field Services should re-orientate extension workers to advocate the use of mobile phones for extension purposes.

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