Potential of Mobile Advisories in Agricultural Extension Services

M. J.Chandre Gowda
Principal Scientist (Ag.Extension),
ICAR Agricultural Technology Application Research Institute, Hebbal, Bangalore- 560 024, Karnataka
Corresponding author email: maravalalu@yahoo.com

ABSTRACT

In an attempt to use the mobile phone platform for providing information support to farmers, Ministry of Agriculture, Government of India launched the Kisaan SMS Portal in July 2013. A telephonic survey was conducted to ascertain the utility of text and voice messages sent from Krishi Vigyan Kendras (KVKs) using the portal. About half the farmers registered to receive SMS could not be contacted during telephonic survey due to out-of-coverage and no-response from farmers. Results revealed that wider reach could be achieved through text messages, but voice messages were effective in making farmers to understand and act upon. Most farmers shared messages with other farmers resulting in horizontal spread of information. Customized advisories could enhance the utility of the messages. As customization needs to be addressed at different levels, it requires convergence. Majority of the farmers want the services to be continued, an indication of utility of mobile advisories in farming operations and activities.

Key words : *Mobile advisories, Extension, Adoption, Communication, Telephone survey*

India has been witnessing rapid growth in mobile subscriber's base, from 584.32 million in 2010 to 904.51 in 2014, whereas during the same period, the wireline subscription decreased from 36.96 million to 28.50 million (Anonymous 2014). With over 988.69 million wireless subscribers by August 2015, the share of rural subscribers is 42.31 % and is gradually increasing (TRAI, 2015). The growing wireless tele-subscription throws up a hitherto less explored opportunity for the planners and developmentagencies, particularly the extension system to reach the unreached in a more unconventional way.

The mobile-based solutions currently in operation in different parts of the world are agriculture advisory services, linking farmers to traders, markets, monitoring extension worker activities, surveys, linking small holder farmers to exporters/buyers and online training(Mahrukh, 2012).Realizing the immense potential of mobile services for agriculture in India, several initiatives were launched. Prominent among the private sector initiatives include Nokia Life Tools, Reuters Market Light, IFFCO Kisan Sanchar, AgriFone 1-2-3, Bubbly, mKrishi, SME Toolkit andeChoupal.

The Kisaan SMS portal launched by Ministry of Agriculture, Government of India is a collaborative effort in many ways. In the backend, it is using the facility of Department of Information and Technology of Government of India to provide information service to farmers at free of cost. In the frontend, it uses the strong network of National Agricultural Research System (NARS) comprising Agricultural Research Institutes, Agricultural Universities and *Krishi Vigyan Kendra* (KVK) for designing relevant advisories.Almost every Government Department, Office and Organization from the Ministry Headquarters down to the level of Block having anything to do with agriculture and allied sectors in every nook and corner of the country has been authorized to use this portal to provide information to farmers on vast gamut of issues. About 7 million farmers have already opted to receive advisories & services on their mobile phones. The farmers register to this service by calling Kisaan Call Center on the toll free number 1800-180-1551 or through the web portal. A farmer can give up to eight choices for his preferred crops/activities. The language choice of the farmer is also being taken at the time of registration. If the mobile of the farmer does not support the regional language, option is given to receive the SMS in regional language written in Roman script. Provision is there for sending Voice messages to the farmers who are not familiar with text messages. Since its inception in July 2013 nearly 720 million messages or more than 2100 million SMSs have been sent to farmers throughout the length and breadth of the country. These figures are rising ever since (http://mkisan.gov.in/aboutmkisan.aspx browsed on 15.10.2015) (DAC, 2015).

The sending Messages is a one-way communication and has all the disadvantages of impersonal communication viz., limited feedback from receiver, understanding of message not known and timing of message not controlled.It is essential to know what is happening to these messages, at the user level and after that. Keeping this in view, a telephonic survey was conducted. Telephone survey is a method of public opinion polling where telephone numbers are used to contact potential respondents, either from the general population or from a known sample (used in the present study). Telephone surveys are the preferred choice to maximize response rates, as well as to maintain control over the quality of the data. The main attraction of telephone interviewing is that it enables data to be

collected from geographically scattered samples more cheaply and quickly than by field interviewing. Interviewing from a central telephone unit lends itself to careful supervision and control. It is possible to avoid cluster sampling, which is used in field survey designs to control interviewer travel costs (Roger and Purdon, 1994).

Telephone surveys are popular in developed countries; however, until now this method has not been popular in developing countries because of low telephone coverage. In recent years, with improving telephone coverage, it is a promising method of data collection. It can be used in studies that address an urban population with good telephone coverage. Telephone interviews aid in covering a wider geographical area within less time and with minimal logistics, like transport (Mahalakshmy and Premarajan, 2008).

METHODOLOGY

The present study has been conducted by collecting feedback on the messages sent to farmers from the Krishi Vigyan Kendras, by using the Portal of Department of Agriculture and Cooperation. Selection of respondents was done by following multi-step random sampling procedure. Random sampling requires a process for selecting members from a determinate population that enables each case to be assigned a probability of selection.

Nine messages,sent from Krishi Vigyan Kendras located in Sothern Indian State of Karnataka, during July (*kharif* season) and November 2013 (*rabi*season), were considered for the study. The message / advisory and the lists of farmers to whom each message was sent were received from the KVKs on the same day for further follow-up. The number of farmers in the lists varied from 78 to 5487. The farmers were arranged in alphabetical order, given serial numbers and used for random selection. The initial target was to contact at least 30 farmers for each message. As the first attempt could not achieve the desired number of respondents for various reasons, another set of 30 farmers were contacted. The process of survey was completed within four days of sending each message to avoid intermixing of responses on the messages received subsequently. Within these four days, out of 60 farmers attempted to be contacted for each message, the number of farmers actually contacted varied from 18 to 53.

During the telephonic survey following questions were asked.

- Whether the message was received?
- If received, was it read/listened? If not read/ listened, reasons?
- If read/listened, was it understood? If not understood, reasons?
- If understood, was there any action? If not, reasons?
- Was the message shared with other farmers?
- Is he interested in receiving messages in future? If yes, what are the areas of interest?

Out of the attempted 540 farmers, 287 farmers could be reached and rest 253 farmers could not be reached. Out ofthose farmers who couldn't be reached, a little more than 30 per cent did not respond to the calls, though their mobiles were ringing. About 20 per cent each of farmers either had switched off their mobiles or were out of reach at the time of calling. Surprisingly, 16 percent numbers were either wrong or didn't exist. About 14 per cent of the farmers' mobiles were busy and showed engaged tone. Non-receipt of messages was more in voice messages, largely due to the fact that voice messages don't get stored in the mobile unlike text messages. To overcome this limitation, it is programmed to send the voice messages up to three times if not received in the first and second attempt. Farmers who would be busy in their farm operations may keep their mobiles somewhere and fail to listen to voice messages even when repeated three times. In India, rural residents often regard mobile phones as valuable resources to be shared by family members and even by close friends, rather than purely personal devices. A study by LIRNE *asia* found that in approximately 80 per cent of Indian households at the bottom of the pyramid in which one member owns a mobile phone, that phone is shared with other family members; in nearly half of these households, the phone sometimes is shared with non-family members, usually at no cost to the user. In one of the report posted on the website of ASPEN Institute, it was reported that members of poor families used a single mobile phone set with multiple SIM cards, wherein a member could then insert his/her SIM card in the phone to make a call (Anon, 2013). In such circumstances, it is possible that only those numbers saved in the name of known persons are likely to be received.

Out of 287 farmers who could be contacted, 57 declined to participate in the survey as they were either busy or were not interested to spare time. Eventually, a total of 230 farmers served as respondents in the study.

The chi-square test has been used to analyze theassociation with comprehension, acting upon and sharing of voice and text messages.

RESULTS AND DISCUSSION

About 80 per cent of the respondent farmers confirmed that they read/listened to the message. Almost everyone (126 out of 130) who received voice message responded that they could comprehend the message. Whereas, only 54 out of 100 farmers comprehended the text messages

Table 1
Influence of text and voice messages on the understanding/not-understanding among farmers

(n=230)

Mode of message delivery	Comprehended	Not Comprehended	Total
Voice	126	4	**130**
Text	54	46	**100**
Total	**180**	**50**	**230**

X^2 = 61.21, Significant at 0.01 level

(Table-1). Chi-square test revealed significant association between voice format and the comprehension. Comprehension or understanding is a precursor for triggering action on messages. This limitation of text messages is bound to have a bearing in terms of reduced acting upon and is rightly reflected in Table 2.

Table 2
Influence of text and voice messages on adoption/ non-adoption among farmers

(n=230)

Mode of message delivery	Acted-upon	Not acted -upon	Total
Voice	79	51	130
Text	8	92	100
Total	87	143	230

X^2 = 66.92, Significant at 0.01 level

The data in **Table 2** depicts the relation between mode of message delivery and acting-upon messages. Together, 87 out of 230 farmers (37.83 %) revealed that either they have acted or decided to act-upon (symbolic adoption). The extent of acting-upon was more for voice messages (60.8%) than for text messages (8%). The value of Chi-square exceeded the critical value at 0.01 level, indicating significant association between voice format andaction on messages. Voice in the messages may make the communication more interpersonal as compared to the otherwise totally impersonal nature of communication in the text messages. Apart from agriculture related messages, farmers may also be receiving too many unwanted text messages from several unrelated sources resulting in loss of credibility on text messages. This may adversely affect the utility of genuine messages sent from agricultural institutions.

Table 3
Reasons for not-acting-upon advisories

(n=230)

Reasons	Farmers (No. and %)	Rank
Not applicable or irrelevant message as the crop is not grown	62 (26.96)	1
Inability to read and understand the message	50 (21.74)	2
Specific problem was not noticed in their field	16 (6.96)	3
Farmer is busy with other activities and could not adopt the advisory	7 (3.04)	4
Message received late	5 (2.17)	5
Not convinced to adopt the advisory	3 (1.30)	6
Total	**143 (62.17)**	

**Figures in parenthesis indicate percentage*

The reasons for no action by a few farmers on some messages are detailed in Table 3. Six reasons have been cited by 143 farmers (62.17% of the total respondents) for no-action. Majority of the farmers (27%) cited the reason that the messages were 'not applicable' (Rank 1) since the particular crop was not cultivated by the farmers. Another seven per cent farmers who did not act as per the advisory reasoned that the "specific problem was not noticed" (Rank 3) in their fields. Both put together, 34 per cent non-adopters responded that the messages were "not relevant" for immediate use. This raises an important need for targeting the messages. Customization is a complex issue which needs to be handled with all possible IT & technical options. If such options are not readily available, it is worth investing in Research and Development (R&D) to find out viable options that help in customization. Inability to read and comprehend the text message (Rank 2) either owing to language problem or due to technical words was the second most important reason for no action. A small number of farmers couldn't act-upon as they were "busy in other operations" (Rank 4), including household activities. A small percentage of farmers felt that the message was not 'timely' to them as they had already adopted a different practice based on their own knowledge and experience.For example, farmers felt that one of the messages related to flower drop in pigeon pea should have been sent a week earlier.This apart, only a fewfarmers expressed that they were not convinced with the advisories provided through mobile.

Table 4
Association between acting-upon and horizontal spread of messages

(n=230)

Categories of respondents on action/adoption	Horizontal spread of messages		Total
	Shared with others	Not shared with others	
Acted-upon	80 (92.0)	7 (8.0)	87
Not acted-upon	68 (47.6)	75 (52.4)	143
Total	148 (64.3)	82 (35.7)	230

X^2 = 46.49, Significant at 0.01 level, Figures in parenthesis indicate percentage

Messages received were shared with other fellow farmers resulting in horizontal spread of advisories (Table 4).This indicates the strength of social capital that still exists in the rural areas. A few farmers have adopted innovative ways to share the message with others and also for their own use at a later date by maintaining a written record of all the messages. Saving the message or keeping a record of messagesis helpingthe farmers to implement the advisories containing scientific information likename of the chemical, its dosage, time of spray etc.in a proper way.

Categorization of respondents on the basis of sharing of messages among adopters and non-adopters revealed interesting facts. Majority of adopters (80 out of 87) shared the messages with others, possibly driven by the conviction that the message would be of some help to others as well.

Table 5
Areas of interest of farmers for receiving messages from Krishi Vigyan Kendras (n=196)

Areas in which the farmers are interested	Farmers (%)
Weather forecasting	34.18
Horticulture crops production aspects	30.10
Pulses (Pigeon pea, Chick pea) production aspects	26.53
Cereals (Paddy, Maize) production aspects	25.51
Plantation crops production aspects	20.41
Plant protection measures	19.90
Livestock production and management aspects	18.88
Market related information	17.35
Information on KVK programmes	12.76

Highly significant chi-square value reinforces the fact that "acting-upon the message" and "sharing with others" are interrelated. Interestingly, good number of farmers who couldn't act-upon too shared the message with others. These farmers could not use the messages as these were not relevant to them, but must have felt that it may be relevant to someone else in the village or to their friends and/or relatives.

Majority of the farmers (196 out of 230 farmers) are happy with the messages being receivedand also want the service to be continued. The major area of interest is weather related information (Table 5). Weather related information is very crucial for all the operations like sowing, planting, inter-cultivation, irrigation, plant protection, harvesting, storing and threshing. Timely and accurate weather information from India Meteorological Department can enhance the credibility of weather-based advisories. Crop production aspects in horticultural crops,pulses, cereals and plantation crops are the next major areas of interest for farmers, followed by information related to plant protection, livestock management and agricultural markets.Providing location specific and need based advisories to the farmers is the need of the hour. A small percentage of farmers did not want to receive the messages for various reasons. For example, one of the respondent farmer requested to delete his name from the list as he has shifted to town along with his son who got a job.

CONCLUSION

Rural India is being richly benefited by the telephonic revolution which can be beneficially utilized by the agricultural extension professionals for reaching the unreached more efficiently and effectively than ever before. Mobile telephones in the hands of link workers, community resource persons, para technicians, field extension workers etc. can help in generating real-time feedback on the ground scenario. For the extension researchers,telephonic survey method is now a possibility for collecting data from the study areas, effortlessly, economically and more accurately.

Language has been a major barrier for applying ICT tools for rural clients, particularly in a country like India whose citizens speak more than 1650 dialects. Even though many manufacturers of mobile handsets are coming out with Unicode compliant

handsets, these are yet to reach the rural market, possibly owing to cost factor. Low cost smart phones may also reach rural market enabling farmers to access all types of information. The issue of language barriers can also be overcome by developing "standards" for conveying messages like the ones being used by traffic police. For example, standards for forecasting rainfall (cloud and rain drops) coupled with not to irrigate (cross marking the water emerging from pump set) or not to take up spray (cross marking spray emitting from nozzle) are language neutral and can be inserted with any text. These "standard icons" could be developed for commonly used terms in agriculture like crops, animals, fertilizer, manure, pesticides etc.

Voice messages, at present, cannot be stored. One option to overcome this problem is to send the same message in text as well, but it may add to tele-traffic. Alternatively, the researchers could think of an application which converts the selected voice messages to text and save in the message box.

Customizing advisories on these specific topics is a major researchable issue. The issue of customization needs to be addressed at several levels and hence requires convergent efforts of all concerned. Mobile numbers of the farmers need to be constantly updated and their interests need to be checked regularly to know, what crops are being grown, stage of the crop etc. so that customization of message becomes more practicable. Application of technology-driven incentives to farmers who update their contact details, message-needs etc. is very much essential. This requires the policy makers to come out with suitable incentive packages.

Paper received on : November 17, 2015
Accepted on : January 05, 2016

REFERENCES

1. Anonymous, 2013. The Emergence of Mobile Phones: Lessons from India (and Elsewhere). ***http://www.aspeninstitute.org***/policy-work/communications-society/programs-topic / communications-policy/india/cs-joint-roundtable-co#sthash.7gjEQriI.dpuf [Dec. 18, 2013].
2. Anonymous, 2014. Annual Report 2013-14. Telecom Regulatory Authority of India. New Delhi. ***http://www.trai.gov.in***/WriteReadData/UserFiles/Documents/AnuualReports/TRAI-Annual-Report-(English)=01042015.pdf [October 26, 2015].
3. DAC, 2015. Kisaan SMS Portal launched by the Hon'ble President. ***http://mkisan.gov.in***/aboutmkisan.aspx[October 15, 2015].
4. Krishna Kumar G. 2013. Rural India can immensely benefit from mobile boom. ***Deccan Herald,*** December 30, 2013.
5. T. Mahalakshmy and K. C. Premarajan, 2008. "Telephone Survey as a Method of Data Collection in South India", ***Indian Journal of Community Medicine***.**33**(4): 268–270.
6. Mahrukh S., 2012. A model for ICT based services for agriculture extension in Pakistan. ***CABI Publication*** FR/CABI-PK/KR10015/2026, www.cabi.org[Jan. 06, 2014].
7. Mehta B.S., 2013. Capabilities, costs, networks and innovations: Impact of mobile phones in rural India. Capturing the Gains: economic and social upgrading in global production networks, ***The University of Manchester,*** UK. www.capturingthegains.org [Jan. 06, 2014].
8. Roger T. and Purdon S., 1994. Telephone methods for social surveys. http://sru.soc.surrey.ac.uk/SRU8.html. Social Research Update, University of Surrey, UK [Jan. 06, 2014].
9. The World Bank, 2013. ICT for data collection and monitoring & evaluation: Opportunities and guidance on mobile applications for forest and agricultural sectors. ***Agriculture and Environmental Services Technical Assistance Paper.*** December 2013. ***The World Bank,*** Washington[Jan. 08, 2014].
10. TRAI, 2015. Information note to the press. ***Press releases of Telecom Regulatory Authority of India.*** http://www.trai.gov.in/WriteReadData/PressRealease/Document/PR-TSD-Aug-14102015.pdf Government of India[October 26, 2015].