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RESEARCH ARTICLE :

Utilization pattern of mobile phone technology (Smartphone) among the farmers of Nagaur district in Rajasthan

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SUMMARY : Now-a-days, one of the most important emerging tools of ICT is the mobile phones with a remarkable growth during last decade. Mobile phone technologies have provided a good platform for farmers to share their knowledge and information among each other in time such as weather information, crop and variety selection, fertilizer and irrigation management, disease and pest management, market prices of the product and on-going government programmes. Keeping this in view, a study was conducted assess the utilization pattern of mobile phones forsharing agricultural information among farmers in Merta block of Nagaur district of Rajasthan. A total of 110 respondents were selected for the study. This study has shown that a majority (83.63%) of the farmer used call to retailor than call to relative farmer (80%), internet user (29.09) and perceived as most information on weedicide, pesticide and disease control (89.09%) through mobile phones. The correlation studies indicated a significant association between educations, with extension agency contact and mass media of the farmer. The analysis showed that the poor connectivity, economic problem, high cost internet services and lack of updated information were some of the problems reported by the respondents.

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KEY WORDS :
M-Learning, ICT, Mobile enabled information, Problemmes, Smartphone

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BACKGROUND AND OBJECTIVES

Today the agricultural sector is facing with a serious challenges for spiraling demand of food, declining agricultural productivity due to natural resources degradation and increasing competition in international markets. Agricultural information has become an important input to increase smallholder agricultural production and getting remunerative markets, thus leading to improved rural livelihood, food security and national economies. Improvement of agricultural productivity will be realized when farmers are linked to market information. However, one major problem in many rural areas is that farmers generally do not have knowledge of prices before they travel to the market. They often have to rely on middlemen who take advantage of this ignorance.

Accurate and timely market information, particularly of perishable items, can significantly reduce transaction and travel costs (Rashid and Elder, 2009).

Information and communication technology (ICT) is one of the promising driving forces to disseminate the agricultural knowledge. A recent study by Kale *et al*. (2015b) reported that extension functionaries have a positive perception towards ICTs for the extension work. The amount, quality and speed of the research, education and extension performance have been improved significantly as a result of the ICT intervention (Kale *et al.*, 2015a). It shows an ample scope to harness the benefits of ICTs in service delivery of the extension system. With effective use of ICTs farmers can get timely farm information and thus increase their productivity and income. With the use of mobile phones farmers can directly communicate with buyers and customers for selling their produce at good price. Wadkar *et al.* (2015) revealed the positive attitude towards the e-Agri service among farmers. Mobile phone technologies have provided a good platform for farmers to share their knowledge and information among each other in time such as market rates and weather information in developing countries (Munyua, 2007). The agricultural information system needs to be developed based on the mass communication technology such as mobile systems. Agricultural practices need precise and accurate information to be disseminated promptly to farmers so that better decisions such as managing farm fields, making continuous and scientific changes in their production systems and grabbing advantage of market opportunities can be made (Jain *et al.*, 2015). ICTs are being proven for the effective agricultural knowledge management in various aspects (Kale *et al*., 2015c). Aker (2010) supported the role of mobile phones in supporting access to information about agricultural technologies and extension services among the agricultural communities.

According to telecom regulatory authority of India (TRAI), the number of telephone subscribers in India increased from 1,036.41 million at the end of December, 2015 to 1,043.29 million at the end of January, 2016, there by showing a monthly growth rate of 0.66 per cent. The share of urban subscribers and rural subscribers at the end of January, 2016 was 57.88 per cent and 42.12 per cent, respectively (Table 1).

Concept of M-learning and M-Agriculture :

O' Malley *et al.* (2003) have defined mobile learning as any sort of learning that happens when consuming, interacting with or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity and fits in a pocket or purse.

Mellow (2005) identifies the advantages of m-learning as follows:

– True flexibility to control the time, place and pace of learning

– Specificity of content

– Tutor-constructed study

– Using technology that is engaging and comfortable for the student

– Non-threatening, private availability of on-demand study support

Jirli and De (2012) opined that m-learning is an art of using mobile technologies to enhance the learning experience. The most important feature that defines m-learning is the mobility that enables information on demand, which is the ability to access information wherever you are and wherever you went.

Kale *et al.* (2015b) m-Agriculture is defined as the delivery of agriculture related information and services via mobile communications technology, in particular mobile phones, smartphones, and tablet devices such as the iPad.

Having made an attempt to understand the concept of m-learning as an educational tool, a few experiments where mobile phone was used as an educational tool are being discussed below :

Some successful experiments on tool mobile learning as an education tool in India :

Keeping in view the importance of these different

Table A : The number of telephone subscribers in India

Sr. No.	Total telephone subscribe (In Millions)			Increasing (%)
		December, 2015	January, 2016	Monthly (%)
1.	Urban	600.66	603.85	0.53
2.	Rural	435.75	439.43	0.85
	Total (In Million)	1036.41	1043.29	0.66

Table B : Selected modern ICT models in India and their evolution over year

Tele- center based	Internet based	Video based
Kissan Call Centers GOI, 2004	Village knowledge centers, 1998	- Digital Green, 2009
BSNL Help line	ITC E- chaupal, 1999	- Video4farmer, 2016
Hello kisan (on DD-Kisan), 2015	E-sagu, 2004	
Mobile-SMS based	Mobile based application	Mobile-voice message based
m-kisan (message –kisan portal), 2013	Kisansuvidha mobile app. , 2016	IFFCO Kisan Sanchar Limited (IKSL), 2007
Reuters Market Light (RML). 2007	Pusakrishi App. , 2016	Mandi on Mobile Service by BSNL, 2011
Kisansanchar, 2010	IFFCO kisan app	m4agriNEI, 2013
Kissan Kerala, 2013	Agrimarket app. , 2016 Etc.	

applications of the mobile phone technology the present study was undertaken to study the utilization pattern of mobile phone technology (Smartphone) by amomg the farmers of Nagaur district in Rajasthan.

RESOURCES AND METHODS

This study was couducted in randomly selected eleven villages from Merta block of Nagaur district of Rajasthan. Since all villages were having near about similar population so 10 respondents who possess mobile phone were selected randomly from each villages. Thus, the total sample size for the study comprised of 110 respondents. An interview schedule was prepared and pre-tested in non sampled area in view of the objective of the study and data were collected by personal interview from the selected mobile phone user. The research design adopted for the present study was exploratory research design.

OBSERVATIONS AND ANALYSIS

It is clear from Table 1 that majority of farmers (74.54 %) belonged to middle age group while 16.36 per cent farmer belonged to old age category followed by farmer who belonged to young age group (9.09%). The analysis of educational background of the respondents (26.36%) had qualification upto high school level followed by 25.45 per cent farmer upto middle level, 19.09 per cent had graduation level, 14.54 per sent had primary level, 9.09 per cent were intermediate passed. Only 5.45 per cent of the farmers did not have any formal education. The frequency showed that 74.54 per cent farmers belonged to other backward caste (OBC). general caste and schedule caste (SC) shared equal population (12.72%). The analysis of landholding of the farmers showed that majority (80.90%) had large size of land holding followed by farmers having small size of landholding (11.81%) and marginal size of land holding (7.27%) and the other frequency showed that more than half of the respondent *i.e.* (54.54 %) have occupation of only farming and followed by 24.54 per cent and 20.90 per cent from farming and business, and farming and service.This result is in conformity with those of Ansari and Pandey (2013) wherein they did a comparative analysis of assessing the potential and use of mobile phones in India.

Pattern of use of mobile applications in attaining the agricultural information :

The use of mobile applications for getting agricultural information by the respondents is categorized into two forms *i.e.*, Non-multimedia (By call) and Multimedia (by Smartphone)

Table 2 reveals that the respondent's attained maximum information from call to retailer (83.63%) followed by call to farmer/ relative(80%), Kisan call center (50.90%), Kisan help line (22.72%), hello Kisan (20%) and m-Kisan (2.72%). The probable reason for limited use of kisan helpline, hello kisan and m-kisan might be the lack of awareness about their services among the farmers. Similarly in multimedia (by Smartphone) usage the majority were found to be internet users (29.09%) followed by what's app (27.27%), facebook (19.09%), newsletter (18.18%), farm publication and online video (13.63% each), E-mail (10%)and twitter (04.54%). Internet use through mobile phones is increasing especially in young farmers to search information on new technologies. Farmers also formed what's app and facebook groups for sharing new information related agriculture. Moreover, the e-skills of the users also affect on the level of use of ICTs (Kale *et al.*, 2016a).

From the perusal of Table 3 it can be observed that

the majority of respondents (89.09%) received information about pesticide and weedicide followed by seed and sowing (83.63%), animal husbandry (70%), market condition and prices (65.45%), fertilizer (62.72%), electricity timing (56.36%) and machinery and farm labour (50.90%) through mobile phones. However, less than 42 per cent respondents reported that they used mobile for getting information related to harvesting and storage, Govt. scheme, use of input and output and news reports. The similar study found that about 30 per cent of the respondents told that they would prefer receiving information about disease identification and control measures, fertilizer applications each. This was followed by information about harvesting time (25%) and about post- harvest operations and marketing (22.23%). Further, about 20 per cent of the respondents reported to be ready

Table 1 :Distribution of respondents based on their socio-economic characteristics **(n= 110)**

Sr. No.	Characteristic	Category	Frequency	Percentage
1.	Age	Young (Upto 25)	10	09.09
		Middle (25 to 50)	82	74.54
		Old (Above 50 years)	18	16.36
2.	Education	Illiterate	6	05.45
		Primary level	16	14.54
		Middle level	28	25.45
		High school level	29	26.36
		Intermediate	10	09.09
		Graduation	21	19.09
3.	Caste category	General	14	12.72
		OBC	82	74.54
		SC	14	12.72
4.	Land holding	Marginal (Less than 1 ha)	8	07.27
		Small (1 to 2 ha)	13	11.81
		Large (More than 2 ha)	89	80.90
5.	Occupation	Only farming	60	54.54
		Farming and service	23	20.90
		Farming and Business	27	24.54

Table 2 : Distribution of the respondent according to the use of mobile applications forgetting agricultural information **(n=110)**

Sr. No.	Mobile / Cellphone	Frequency	Percentage
By Call			
1.	Kisan call center	56	50.90
2.	Kisan help line	25	22.72
3.	Hello kisan (DD Kisan)	22	20.00
4.	M- Kisan	03	02.72
5.	Call other farmer / Relative	88	80.00
6.	Call to retailer	92	83.63
By Smartphone			
1.	By Internet	32	29.09
2.	Online video/ webcast	15	13.63
3.	Online farm publication	15	13.63
4.	Email	11	10.00
5.	Facebook	21	19.09
6.	Twitter	05	04.54
7.	Online audio content	10	09.09
8.	News letter	20	18.18
9.	What's app	30	27.27

Table 3 : Distribution of the respondent according to types of information obtained through mobile phones **(n=110)**

Sr. No.	Type of information	Frequency	Percentage
1.	Seed and sowing	92	83.63
2.	Fertilizer	69	62.72
3.	Pesticide, weedicide and disease control	98	89.09
4.	Machinery and farm labour	56	50.90
5.	Use of input and output	43	39.09
6.	Harvesting and storage	46	41.81
7.	Marketing condition and prices	72	65.45
8.	Electricity timing	62	56.36
9.	Animal husbandry	77	70.00
10.	Govt. scheme	44	40.00
11.	News reports	37	33.63

to receive the information regarding sowing time followed by agronomic practices (16.66%) and seed treatment (16.66%), and crop variety recommended/appropriate (11%) (Ansari and Pandey, 2013).

However, it is important to note that identifying the value of information is difficult as indicated by Marcel and Bart (2012). They further mentioned that value of information keeps changing with every circumstance. In particular, information is useful when the farmer who received the advisories can act upon it. For example, daily updates on the prices of agricultural commodities in the local markets of the surrounding district are most useful during harvesting time. In contrast, availability of agricultural inputs and input prices information are most useful at planting time. Similarly, information about improved crop production and management practices are mainly helpful to farmers during crop cultivation. This means that, for information to be useful it must be provided in a timely manner.

Conclusion :

Really mobile phones have provided new approach to farmers to make tentative decisions much more easily than before. Use of mobile phones lead to greater social cohesion and improved social relationships among farmers. Mobile phone is increasing among farmers but still there is gap available. Hence, there is need for enhancing different project about mobile phone technologies where farmers could get easy access to communicate. The government and other related department should also plan to reach these farmers and provide latest information about seed, weather and market on the time and provide good price of their product. The poor connectivity, economic problem, and lack of updated information were some of the problems reported by the use of M-learning.

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REFERENCES

Aker, J.C. (2010). Dial "A" for agriculture: using information and communication technologies for agricultural extension in developing Countries. Tuft *University, Economics Department and Fletcher School, Medford MA02155*, 37.

Ansari, M.A. and Pandey, N. (2013). Assessing the potential and use of mobile phones in agriculture, *Karnataka J. Agric. Sci*., **26** (3): 388-392.

IANS (2008). Farmers to get market rates on BSNL mobiles. Retrieved fromnewsportal/business/farmers-to-get-market-rates-on-bsnl-mobiles 100116668; http://www.thaindian.com/

IASF (2013). Intelligent Advisory System for Farmers:Retrieved from http://iasf.cdacmumbai.in/ias/index.jsp .

IFFCO (2008). IFFCO and Airtel Join Hands to Usher in the Second Green Revolution. Joint venture Company IFFCO Kisan Sanchar Ltd. to provide big boost to Indian agriculture and rural economy.http://www.iffco.nic.in/ applications.

ILRI Project File, (2012). MKisan-Using Mobile Technologies to Strengthen Farmer-Extension-Expert-Linkages in India: http://cgspace.cgiar.org/ bitstream/handle/10568/24461/mkisanMobileOct2012.pdf

Jain, L., Kumar, H. and Singla, R.K. (2015).Assessing mobile

technology usage for knowledge dissemination among farmers in Punjab. *Inform. Technol. Dev.*, **21**(4) : 668-676.

Jirli, B. and De, D. (2012). M-learning in ICTs. In: *Digital opportunities in agricultural extension*. pp. 169-184. Agribios, India.

Kale, R.B., Babu, G.P., Mohammad, A., Meena, M.S., Vairagar, V.G. and Kad, S.V. (2015a).Perceived effect of information and communication technology use in the performance of dairy scientists. *Internat. J. Appl. Res. Information Technol. & Computing*, **6**(1) : 38-43.

Kale, R.B., Meena, M.S., Meena, H.M. and Singh, Y.V. (2015b). Importance and challenges of m-Agriculture in Indian context. *Indian Fmg.*, **65**(9) : 44.

Kale, R.B., Rohilla, P.P., Meena, M.S. and Wadkar, S.K. (2015c). Information and communication technologies for agricultural knowledge management in India. *J. Global Communication*, **8**(1) : 16-22.

Kale, R.B., Meena, M. S. and Rohilla, P. P. (2016a). Determining factors and levels of e-skills among agriculture experts of Krishi Vigyan Kendras in India. *J. Agr. Sci. Tech*., **18** : 1-12.

Kale, R.B., Meena, M.S., Singh, Y.V. and Meena, H.M. (2016b). Scientists' perception towards role of information and communication technologies in agricultural extension. *National Academy Science Letters*, **39**(2) : 91-93.

Marcel, F. and Bart, M. (2012). Impact of SMS-Based Agricultural Information on Indian Farmers. The World Bank Economic Review, Published by Oxford University Press on behalf of the International Bank for Reconstruction and Development, pp. 1-32. Retrieved July 10,2012,from http://wber.oxfordjournals.org/content/early/2012/02/27/wber.lhr056.full.pdf+html.

Mellow P. (2005).The media generation: Maximise learning by getting mobile. Proceedings of ASCILITE 2005 held in Auckland University of Technology New Zealand Retrieved on 12 January 2006 [http://*www.ascilite.org.au/Nconferences/brisbane05/proceedings.shtml*]

Munyua, H. (2007). ICTs and small-scale agriculture in Africa: a scoping study.

O'Malley, Claire, Vavoula, Giasemi, Glew, Jp, Taylor, Josie, Sharples, Mike, Lefrere, Paul, Lonsdale, Peter, Naismith, Laura and Waycott, Jenny (2003). MOBILearn.Guidelines for learning, teaching and tutoring in a mobile environment.Retrieved *fromwww.mobilearn.org*.

Rashid, A.T. and Elder, L. (2009). Mobile phones and development: An analysis of IDRC-supported projects. *Electro. J. Inform. Systems Deve. Countries*, **36** (2) : 1-16.

Wadkar, S.K., Singh, K., Mohammad, A., Malhotra, R. and Kale, R.B. (2015)**.** Identifying the factors governing attitude towards the e-Agri service among dairy farmers in Maharashtra, India. *J. Agric. & Rural Dev. Tropics & Subtropics*, **117**(1) : 1-10.

WEBLIOGRAPHY

TRAI (2016) "Telecom Regulatory Authority of India", available at: http://*www.trai.gov.in*/.

www.kissankerala.net (2013). Kissan Kerala Mobile based Agricultural Information Services. http://*www.kissankerala.net /sms/index.jsp*.