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IMPACT OF CELL PHONE ENABLED INFORMATION SERVICES IN THE KNOWLEDGE UP GRADATION OF FARMER ABOUT IMPROVED CROP PRODUCTION TECHNIQUES

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ABSTRACT

At the present time information is the power; exchange and sharing of information have become easier due to availability of number of communication technologies, even in remote rural villages. Vertical and horizontal sharing of information in agriculture sector will certainly increase the knowledge of farmers about improved agricultural production and marketing techniques which will improve their socio-economic status. The Indian Farmers Fertilizer Cooperative Limited (IFFCO) launched a project to leverage information and communication technology, in particular mobile telephony to disseminate expert agricultural knowledge to small-scale farmers in rural India. The newly created IFFCO Kisan Sanchar Limited (IKSL) is a joint venture between IFFCO and Airtel. IKSL manages the distribution of mobile phones, SIM cards and information services to small farmers and uses a sim card with a voice message platform to record content and send information to farmers through voicemail. Farmers get access to five daily messages in their local language with crop and area specific information in relation to agricultural technology and information & services A help line and interactive information services, all free of cost is also available. Keeping in mind the available services of IFFCO and information needs of farmers, a case study on mobile telephony services of IKSL entitled "Impact of cell phone enabled information services in the knowledge up gradation of farmer about improved crop production techniques" was formulated. The present study is more concerned about knowledge of mobile phone users regarding improved crop production techniques. The study was conducted in purposively selected Baran district of Rajasthan State. For selection of respondents, 60 cell phone users and 60 non-users were randomly selected. Data were collected by the investigator through personal interview technique with the help of structured schedule. The study revealed that majority of cell phone users and non-users possessed medium level of knowledge whereas; more than 40 per cent cell phone users and only 5.33 per cent non-users were reported to have high level of knowledge about improved crop production techniques. The study further indicated that the extent of knowledge of mobile phone users was from 64.03 to 88.23 percent, while in case of non-users it was found from 44.76 to 65.05 percent in all major improved crop production techniques. It was also observed that there was a significant difference between mobile phone users and non-users with regard to possession of knowledge about improved crop production techniques.

INTRODUCTION

The agricultural sector is critically important in any developing economy and no less so in India, where it contributes close to 13.9% of GDP (Economic survey 2012-13) and where 60% of the population depends on agriculture either directly or indirectly. As India urbanizes, the urgent need to alleviate poverty amongst both rural and urban populations makes it essential to catalyze agricultural productivity. The Indian agricultural sector, however, despite periods of strong growth in the past, has more recently experienced low productivity growth. Therefore, serious challenges must be addressed in order to achieve faster productivity growth, including infrastructure constraints, supply chain inefficiencies and also significant problems in the diffusion and access to information. Small scale producers, who make up the vast majority of Indian farmers, are often unable to access information that could increase yields and lead to better prices for their crops. The increasing penetration of mobile phone net-

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works in India presents an opportunity to make useful information more widely available. There are an estimated 127.3 million 'cultivators' in India. The majority of them are farmers subsisting on small plots of land less than 5 acres in size.

Agriculture's share to GDP has declined from 48.7% in 1950 to 13.9% in 2012. Productivity growth has been hampered by major challenges including deficits in physical infrastructure, availability of agricultural inputs such as seed, fertilizer and agro information services in rural areas, and access to the informations. The availability of necessary products and services is variable in rural India. Small farmers often struggle to access high-quality inputs such as improved seed varieties, or services such as soil testing or credit. Finally, there is very uneven access to information. A national survey of farmers found that only 40% of farmer households accessed information about modern agricultural techniques and inputs. The most common information source used by households accessing information was "other progressive farmers" followed by input dealers.

Today, most farmers had access to a variety of information sources that they consulted for agricultural information. This included TV, radio, newspapers, other farmers, government agricultural extension services, traders, seed companies and relatives. However, the perceived quality and relevance of the information provided by these sources was highly variable. According to Bertolini, 2004 knowledge and information are important factors for accelerating agricultural development through increased production and improved marketing and distribution. ICT could make the greatest contribution by telescoping distances and reducing the cost of interaction between stakeholders. ICT has the potential to help farmers in the entire cycle of production, i.e., from production to sales.

The Indian Farmers Fertilizer Cooperative Limited (IFFCO) launched a project to leverage information and communication technology, in particular mobile telephony to disseminate expert agricultural knowledge to small-scale farmers in rural India. The newly created IFFCO Kisan Sanchar Limited (IKSL) is a joint venture between IFFCO and Airtel. In India, particularly in Rajasthan, farmers in rural areas have little access of information about improved farming practices and rural development services. IKSL manages the distribution of mobile phones, SIM cards, and information services to small farmers and uses of a sim card with a voice message platform to record content and send information to farmers through voicemail. Farmers get access five daily messages in their local language with crop and area specific information in relation to agricultural market prices and arrivals, availability of fertilizers, electricity timings, early warning systems on disasters, weather forecast, best farming practices, local crops management, education and upcoming training opportunities, plant and veterinary disease prevention, financing, insurance services and government schemes; a help line and interactive information services, all free of cost is also available. Keeping in mind the available services of IFFCO and information needs of farmers regarding improved crop production techniques; the entire study on mobile telephony services of IKSL entitled "Impact of cell phone enabled information services in the knowledge up-gradation of farmer about improved crop production techniques" was formulated with the following specific objectives:

(i) To assess the level of knowledge of cell phone users and non-users about improved crop production techniques.

(ii) To compare the knowledge between cell phone users and non-users about improved crop production techniques.

RESEARCH METHODOLOGY

The present study is more concerned about knowledge of cell phone users regarding improved crop production techniques. The study was conducted in the year 2011 to 2012 in purposively selected Baran district of Rajasthan State, which has seven Panchayat Samities i.e. Anta, Atru, Baran, Chhabra, Chhipabarod, Kishanganj and Shahabad. Out of these 07 Panchayat Samities two namely Anta, Baran having maximum number of Gram Panchayat (Anta- 38 G.P, Baran- 27 G.P.) were selected for the study. Further, five village Panchayat from each panchayat Samities having highest number of IKSL mobile phone users was selected for the investigation. Thus 10 village panchayat have been selected and 06 IFFCO's mobile phone user respondents from each selected village panchayat were selected ran-

domly, thus 60 cell phone users of IKSL were included in the experimental group of the study. Similarly equal numbers of non-user of IKSL mobile phone were selected randomly from ten nearby villages of the study area. Thus in all 120 respondents were included in the sample of the study. Data regarding knowledge of improved crop production techniques were collected by the investigator through personal interview technique with the help of structured schedule. Thereafter, data were tabulated, statistical tools were applied, and interpretations were made in the light of objectives.

Measurement of knowledge: To measure the knowledge level of mobile phone users and non-users about improved crop production techniques, an interview schedule was developed. Eight major improved crop production techniques were included in the schedule viz., Soil management, Variety selection, Seed sowing, Irrigation, Nutrient management, Weed management, Pest & Diseases control, and Storage & marketing practices. Each major practice was further divided into several questions to explore existing knowledge of respondents. One score was assigned to each correct answer and each wrong answer was given zero score.

The knowledge index of each respondent was calculated by using the following formula:

$$KI = \frac{K}{P} \times 100$$

Where,

KI = Knowledge index

K = Knowledge score obtained

P = Maximum obtainable score

RESULTS AND DISCUSSION

This section contains discussion on the existing status of knowledge of mobile phone users and non-users of IFFCO Kisan Sanchar Limited (IKSL) about improved crop production techniques in the study area. Knowledge as a body of understood information possessed by an individual is the important component of the behavioural aspect and plays an important role in the adoption of the innovations. On this ground, it is important to examine the extent of knowledge of cell phone user and non-user respondents about improved crop production techniques. To get an overview of the knowledge level, the respondents were categorized into low, medium and high knowledge groups on the basis of calculated mean and standard deviation of the obtained knowledge scores by the respondents.

Table1: Distribution of respondents on the basis of their level of knowledge about improved crop production techniques (n=120)

S. No.	Level of knowledge	Cell phone users		Non-users		Total	
		F	%	F	%	F	%
1.	Low (d"54)	1	1.67	24	40.00	25	20.83
2.	Medium(55 to 65)	34	56.67	33	55.00	67	55.87
3.	High(e"66)	25	41.66	3	5.00	28	23.33
	Total	60	100	60	100	120	100

Table -1 reveals that 55.87 per cent of total respondents possessed medium level of knowledge about various improved crop production techniques, while only 23.33 per cent respondents were observed in the high knowledge group and 20.83 per cent respondents possessed poor knowledge about improved crop management practices. It is further clear from the table that 56.67 per cent cell phone users and 55.00 per cent non-users were observed in the category of medium knowledge level; whereas a considerable number of cell phone users 41.66 per cent and only 5.00 per cent non-users were reported to have high level of knowledge. It was further noted that 40.00 per cent of non user of mobile phone had poor knowledge about improved crop production techniques in the study area. On the basis of above data it was inferred that majority of the cell phone users and non-users possessed medium knowledge

regarding improved crop production techniques. It was further concluded that the existing knowledge of cell phone users about scientific crop production techniques was comparatively higher than the non-user of mobile phone which may be due to mobile phone enabled information services of IKSL.

Individual practices-wise knowledge of mobile phone users and non-users was also worked out. For this mean percent score (MPS) of each major practice was calculated. The findings about the same have been presented in the table-2.

Table 2: Extent of knowledge of cell phone users and non-users about improved crop production techniques (n=120)

S. No.	Crop Management Practices	Cell phone users (n=60)		Non-users (n=60)	
		MPS	Rank	MPS	Rank
1.	Soil management	67.20	V	50.98	IV
2.	Variety selection	82.83	II	60.00	II
3.	Seed sowing	68.62	IV	56.80	III
4.	Irrigation	65.20	VII	44.98	VII
5.	Nutrient management	64.03	VIII	48.76	V
6.	Weed management	76.07	III	45.00	VI
7.	Pest & Diseases control	88.23	I	65.05	I
8.	Storage and marketing	65.80	VI	44.76	VIII

MPS = Mean Percent Score

Table-2 Reveals that cell phone user and non-user respondents possesses maximum knowledge about pest & diseases management practices with mean percent score 88.23 and 65.05, respectively and ranked first by both the categories of respondents. Majority of respondents had complete idea about major pests and diseases of main crops viz. caterpillar of soybean, white rust of mustard, viral mosaic of Green gram and their control measures. Most of the mobile phone users were aware about the names and uses of popular pesticides. The knowledge about varieties of major crops was placed on second rank by the users and non-users of IKSL with 82.83 and 60.00 MPS, respectively.

Likewise the extent of knowledge of cell phone users and non-users about weed management practices was 76.07 and 45.00 MPS, respectively. Majority of mobile phone users knew the names and using method of herbicides, while non-user respondents were depend on traditional methods of weed control i.e. weeding by hands and simple implements. Regarding knowledge about seed sowing practices, it was observed that cell phone users and non-users possessed 68.62 and 56.80 MPS, respectively; more than 55 per cent of mobile phone users and about 35 per cent of non-users had idea about the line to line spacing in the major crops, sowing depth of seeds, use of seed drill, seed treatment and use of bio-fertilizers at the time of sowing. Not a single non-user of cell phone possessed knowledge about germination test before sowing of the seed. Knowledge of mobile phone user and non-user respondents about soil management practices was recorded 67.20 and 50.98 MPS, respectively. Majority of cell phone users and some of non-user respondents had complete awareness about importance of soil testing, collection of soil samples, uses of gypsum and deep ploughing of summer season.

In case of storage of crop produces and their marketing the extent of knowledge of cell phone users and non-users was 65.80 and 44.76 MPS, respectively. It was noted that mobile phone users had more knowledge about scientific storage of crop produces than non-users of mobile phone services given by IKSL. The cell phone users knew the market rate of various crops and they sold their produces in Krishi Upaj Mandi on higher rates; while non-user respondents sold their produce to local purchaser due to lack of knowledge about market price.

Further, the data in the table show that the knowledge of cell phone users and non-users about irrigation management was 65.20 and 44.98 MPS, respectively. It was also observed that cell phone users had some idea about the critical stages of irrigation in the major crops; while non-users had no idea about the same. The knowledge of cell phone users and non-users regarding nutrient management was poor than other practices with 64.03 and 48.76 MPS, respectively. The data show that cell phone users also applied micronutrients with major nutrients Nitrogen & phosphorus. Not a single non-user was aware about the deficiency symptoms of micronutrients.

Thus from the above discussion, It could be concluded that the cell phone user respondents had more knowledge than non-user of mobile phone about all the major improved crop production techniques. The extent of knowledge of cell phone users was 64.03 to 88.23 MPS, whereas in non-users it was found to be from 44.76 to 65.05 MPS about all the practices of crop production.

Similar results were reported by Jensen, 2007 examining the impact of mobile phone use by Kerala fishermen. He found that the introduction of mobile phones decreased price dispersion and wastage by facilitating the spread of information, which made markets more efficient and enhanced both consumer and producer welfare. Mobiles allow fishermen, particularly the more prosperous ones, to get timely price information and decide on the best place to land and sell their daily catch.

Aspect wise comparison of knowledge among cell phone user and non-user respondents:

In addition to the extent of knowledge of respondents about improved crop production techniques; it was also felt necessary to compare the knowledge of cell phone users and non-users in all the major practices of scientific crop management. To find out the variation of the knowledge of respondents; 'Z' test was applied. The results are presented in the table-3.

Hypotheses

$NH_{0.1}$ – There is no significant difference between knowledge of cell phone users and non-users about improved crop production techniques.

$NH_{1.1}$ – There is significant difference between knowledge of cell phone users and non-users about improved crop production techniques.

Table3: Comparison of knowledge between cell phone user and non-user respondents about improved crop production techniques (n=120)

S. No.	Crop Production Practices	Cell phone users		Non-users		Difference	'Z' Value
		Mean	S.D.	Mean	S.D.		
1.	Soil management	13.31	1.32	10.80	2.19	2.51	9.45**
2.	Variety selection	15.00	0.99	12.75	3.95	2.25	8.15**
3.	Seed sowing	13.91	2.34	10.91	1.27	3.00	8.72**
4.	Irrigation t	7.11	1.36	5.40	1.77	1.71	5.93**
5.	Nutrient management	12.33	3.75	8.40	1.84	3.93	7.28**
6.	Weed management	8.66	1.09	6.48	1.77	2.18	10.56**
7.	Pest & Diseases control	25.45	2.67	21.00	4.96	4.45	6.11**
8.	Storage and marketing	11.38	2.43	8.33	1.54	3.05	8.24**

** Significant at 1 percent level

The calculated 'Z' value was found to be greater than tabulated value at 1 per cent level of significance in all eight improved crop production techniques (Table 3). This leads to the conclusion that there was significant difference in level of knowledge between cell phone users and non-users about all the improved crop production techniques. The mean value further indicates that mobile phone users had higher knowledge mean than non-users in all improved crop production techniques. This reveals that mobile phone user respondents possessed more knowledge than non-users of mobile phone. Similar results were found by Silva and Ratnadiwakara, 2008.

CONCLUSION

The findings shows that majority of respondents possessed medium level of knowledge whereas; more than 40 per cent cell phone users and only 5.00 per cent non-users were reported to have high level of knowledge, the extent of knowledge of cell phone users and non-users was 64.03 to 88.23 & 44.76 to 65.05 MPS about all major improved crop production techniques. Therefore, it may be concluded that mobile phone user respondents possessed more knowledge than the non-users of mobile phone services of IKSL. It was also observed that there was a significant difference between cell phone users and non-users with regard to possession of knowledge about improved crop production techniques. The reason behind it may be that the cell phone users are closely associated with experts of IKSL and got need based information regularly. Further inferences can be drawn that there has been positive impact of IKSL mobile phone services on the users which has more knowledge about improved crop production techniques. Therefore, it is recommended that cell phone enabled information services should be extended to the non-user farmers so that scientific knowledge about crop production techniques can be enhanced among the farming community.

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