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Effectiveness of Mobile-based Advisory to Farmers in Soil and Water Conservation

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Introduction

The generation and application of agricultural knowledge is increasingly important, especially for small and marginal farmers, who need relevant information in order to improve, sustain, and diversify their farm enterprises. ICTs can directly support farmer's access to timely and relevant information, as well as empower the farming community through creation and sharing of knowledge. ICTs essentially facilitate the creation, management, storage, retrieval, and dissemination of any relevant data, knowledge, and information that may have been already been processed and adapted (Batchelor, 2002; Chapman and Slaymaker, 2002; Rao, 2007; Heeks, 2002). In the past, television and radio were the main electronic broadcast technologies used to reach rural communities; however, in the past two decades, internet and mobile-based channels have emerged. ICTs now include computer-based applications and such communication tools as social media, digital information repositories (online or offline), and digital photography and video, as well as mobile phones (Balaji *et. al.* , 2007).

Among the ICT tools, the rise of the mobile phone has been one of the most spectacular changes in the developing world over the past decade. Mobile phone, because of its affordability, accessibility, minimum skill requirement, widespread network etc., has emerged as important tools for the smallholder farmers. The increase in use of mobile phones across the globe and India has impinged on agriculture in various ways. Mobiles are being used to help raise farmers' incomes, making agricultural marketing more efficient, lowering information costs, reducing transport costs, and providing a platform to deliver services and innovate. Whether the potential of these trends can be realized more widely, especially in rural areas and in an equitable way, is uncertain. Every aspect of the technology is changing rapidly; the public sector, private sector, and private citizens are constantly experimenting with new applications for it. Mobile phone penetration in rural India is expanding rapidly (from 1.4 units

per 100 people in 1995 to 51 units, or one phone per two persons, currently). There are a number of initiatives using mobiles to communicate information directly to farmers; these include IKSL (IFFCO Kisan Sanchar Ltd. in collaboration with Airtel), Mandi on Mobile (BSNL and Uttar Pradesh Marketing Board), Reuters Market Light, and Nokia Life Tools and mKRISHI®. With the promising role of ICT in agriculture development and poverty reduction, modest has been done to realize the full potential of the ICT in this field. Several attempts made so far in India and other parts of the world about describing the project in software and hardware aspects. Very little investigation has been done concerning the effectiveness and impact study of the ICT project. Keeping above points in view a project on "Creation of ICT Network to Disseminate Knowledge about the Soil and Water Conservation Technologies to Farmers in Himalayan Region" was formulated.

Methodology

The study was conducted in Raipur, Vikasnagar and Kalsi blocks of Dehradun district in Uttarakhand. Three villages from each block were selected randomly. Simple random sampling was used for the selection of respondents. The study followed descriptive survey research and experimental design. Benchmark survey in the selected villages was done to obtain the information on socio-personal and agro-ecosystem. Survey, in-depth discussion and participant observation methods were used for collection of primary data with the help of interview schedule (structured and semi-structured). Reports, literature published by various government/ non-government agencies and reference material available on internet were referred for secondary data collection. ICT tools used in the project were mobile (android and IVR), voice recorder, video camera, internet, etc. In each block, 40 respondents were selected from each of 3 experimental villages. Hence, total 360 farmer respondents were interviewed for the study. Total 60 extension workers/input dealers/development functionaries were included for sending messages and interviewed to ascertain the effectiveness of the intervention. For measuring effectiveness of the platform, different treatments were taken in the selected villages of the different blocks. Treatments were as follows: Treatment 1: Not any intervention of the project, Treatment 2: Only text message will be sent to the respondents, Treatment 3: With text message, exposure visits, meetings, group discussions and trainings on soil and water conservation and other components will be given.

A MoU was signed between ICAR- Indian Institute of Soil & Water Conservation, Dehradun and TATA Consultancy Services Limited, Mumbai to collaborate in order

to carry out the ICT Extension services in the study area. ICT platform namely PAWS (**personalized advisory on water and soil**) service was created under TCS patented platform mKRISHI®".

Results and Discussions

Satisfaction level of farmers from the mKRISHI® PAWS service:

The farmer's satisfaction was operationally defined as the perceived need contentment by the utilization of services provided by mKRISHI® PAWS. It was found that more than 80 percent of farmers perceived that their needs were fulfilled with full satisfaction with regard to agronomical latest package of practices, while 19.58 percent of the farmers assumed that their needs were fulfilled with average satisfaction. About the latest NRM technologies in soil and water conservation, about 99 percent of them assumed that their needs would be fulfilled in future. About 84 percent of the farmers observed that their needs were fulfilled with full satisfaction with regard to the technological advisory in hill based horticulture. While considering the crop protection technologies, 83.33 percent of the farmers perceived that their needs were fulfilled with full satisfaction and about 16 percent of them felt that the needs were fulfilled with average satisfaction. About 60 percent of them believed that their needs were fulfilled with full satisfaction with respect to the soil health card/ nutrients based information, while 40.41 percent felt that their needs were fulfilled with average satisfaction. About 65.41 percent of the farmers perceived that their needs were fulfilled with full satisfaction with regard to weather information and about 14 percent felt that need was fulfilled with least satisfaction in the same concern.

Timeliness of the messages

It referred to the services provided by the mKRISHI® PAWS at the appropriate time to the farmers in terms of seasonality of the crops grown. More than 81 pre cent of the farmers perceived that information regarding the agronomical latest package of practices for hilly regions was provided in advance of the season, while 18.75 percent of them perceived that it was provided at the time of use of technology to the particular cropping season. All the respondent farmers assumed that information regarding the latest NRM technologies in soil and water conservation was provided in advance. In case of technological advisory in hill based horticulture, 72.5 percent of the farmers responded that the advisory services were provided in advance of the season, 27.5 percent of the farmers told that it was provided at the time of usage of technology during cultivation of the crop. Regarding the crop protection technologies, 77.5 percent of farmers felt that the services were at the time of usage of technology

during the cropping season, while 22.5 percent of them responded that the services are provided in advance. For the soil health card/nutrients based information, 43 (53.8%) farmers perceived that the information were provided in advance and 97 (40.41%) farmers responded it was provided at the time of technology is to be used. Almost (99.58%) all the farmers perceived that information needs were fulfilled in advance with regard to weather.

Appropriateness of the Technology Provided by mKRISHI® PAWS

It was operationally defined as suitability of the technological messages provided by the mKRISHI® PAWS based on their farming conditions and climate of the farmers in particular region. About 80 percent of farmers perceived that the agronomical latest package of practices for hilly regions provided by mKRISHI® PAWS was highly appropriate to their field situation, while about 20 percent of farmers perceived that it was appropriate for their location (Table-1). Nearly 84 percent of the farmers felt that the information regarding the latest NRM technologies in soil and water conservation was appropriate to their condition, while 16.25 percent of farmers felt that it was moderately appropriate for their situation. About technological advisory in hill based horticulture, about 69 percent of farmers believed that it was highly appropriate in

Table 1. Appropriateness of the technology provided by mKRISHI® PAWS N=240

S. N.	Services under PAWS	HA		A		MA		SWA		NAA	
		(f)	%	(f)	%	(f)	%	(f)	%	(f)	%
1.	Agronomical latest Package of Practices for hilly regions	191	79.58	49	20.41	0	0.00	0	0.00	0	0.00
2.	Latest NRM Technologies in soil and water conservation	0	0.00	201	83.75	39	16.25	0	0.00	0	0.00
3.	Technological Advisory in hill based horticulture	165	68.75	75	31.25	0	0.00	0	0.00	0	0.00
4.	Crop Protection technologies	186	77.5	54	22.5	0	0.00	0	0.00	0	0.00
5.	Soil Health Card/ Nutrients based information	124	51.66	116	48.33	0	0.00	0	0.00	0	0.00
6.	Weather Information	130	54.16	110	45.83	0	0.00	0	0.00	0	0.00

HA: Highly Appropriate, A: Appropriate, MA: Moderately Appropriate, SWA: Somewhat Appropriate, NAA: Not at all Appropriate

their situation, while 31.25 percent of farmers believed that it was appropriate in their condition. About crop protection technologies, 77.5 percent of farmers believed that it was highly appropriate in their situation, while 22.5 percent of farmers believed that it was appropriate in their condition. Regarding soil health card/nutrients based information, about 52 percent of farmers believed that it was highly appropriate in their situation, while about 48 percent of farmers believed that it was appropriate in their condition. With respect to weather based information, about 54 percent of farmers believed that it was highly appropriate in their situation while about 46 percent of farmers believed that it was appropriate in their condition.

Conclusion

Location specific, crop specific and messages in local languages were found to be very effective method of transfer of technologies. The approach adopted by using ICT was unique to cover more number of farmers with maximum efficiency and effectiveness. The adoption rate among the farmers was found to be very fast as compared to other mechanisms of transfer of technologies. Hence the methodology can be deployed to other states of the country.

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