

## Farmers' Experience with ICTs on Transfer of Technology in Changing Agri-rural Environment

**B. L. Dhaka<sup>1</sup> and K. Chayal<sup>2</sup>**

1. Programme Coordinator, 2. SMS (Home Sc.), Krishi Vigyan Kendra, Post Box No. - 4, Bundi, Rajasthan  
Corresponding author e-mail: bldhaka@gmail.com

### ABSTRACT

*There is an increasing realization about the potentialities of Information and Communication Technology (ICT) in dissemination of agricultural technologies among the farmers. The extensive use of modern information technology needs to be promoted for communication between researchers, extension workers and farmers to transfer technologies and information in a cost effective manner. The use of ICT is an important pillar of agriculture extension. Here, attempt has been made to analyze the reaction of the farmers towards ICT as a source of reliable and timely information about best production practices, processing, marketing, input and output prices, financial and risk-covering institutions etc. The favourable attitude of farmers towards ICT as an effective and efficient information support tool would lead to stronger conviction and efficient extension programme planning. The focus of this study was on the attitude of farmers towards Information and Communication Technology as a source of information. Stratified random sampling technique was used in the selection of seventy five farmers as the sample for the study. A pre-tested structured interview schedule was used to elicit information from the respondents. The data were analyzed using appropriate statistics tool. The findings showed that majority of the farmers had favourable attitude towards the Information Technology.*

**Keywords:** Agriculture, Information, Communication, Technology, Farmer

The 'Task Force on India as Knowledge Superpower' (GOI, 2001) emphasized the necessity of developing the capacity to generate, absorb, disseminate and protect knowledge and exploit it as a powerful tool to derive societal transformation. Information and Communication Technology (ICT) can play a significant role in achieving such a transformation as it consists of three main technologies. They are: Computer Technology, Communication Technology and Information Management Technology. These technologies are applied for processing, exchanging and managing data, information and knowledge. Recent developments in information and communications technology (ICT) offer a great opportunity to facilitate the flow of information and technology services delivery especially to the farmers (Maningas, 2006). It is comprehensible that on the one hand agriculture is becoming highly science driven and knowledge intensive, but on the other hand the existing public extension system, has become less effective, more time consuming

and costly and fails to meet the expectations of those involved in agricultural production (Mruthunjaya and Adhiguru, 2005). The extensive use of modern information technology needs to be promoted for communication between researchers, extension workers and farmers to transfer technologies and information in a cost effective manner. ICT has many potential applications in agricultural extension (Zijp, 1994). It can bring new information services to rural areas where farmers, as users, will have much greater control than before over current information channels. The use of ICT is an important pillar of agriculture extension and in the current scenario of a rapidly changing world, has been recognised as an essential mechanism for delivering knowledge (information) and advice as an input for modern farming (Jones, 1997). Here, an attempt has been made to analyze the reaction of the farmers towards ICT as a source of reliable and timely information about best production practices, processing, marketing, input

and output prices, financial and risk-covering institutions etc. The favourable attitude of farmers towards ICT as an effective and efficient information support tool would lead to stronger conviction and efficient extension programme planning in changing agri-rural environment. The focus of this study was on the attitude of farmers towards Information and Communication Technology as a source of information.

**METHODOLOGY**

The study was conducted in Bundi district of Rajasthan to analyse experience of farmers using ICT services for agricultural information. The population of the study consisted of farmers using ICT services. A sample of 75 farmers was selected through stratified random sampling technique as respondent. In order to ascertain the information need of the farmers, an exhaustive list of possible needs was prepared through meticulous review of literature, consultation with experts and extension workers. The farmers in the study were asked to rate the listed needs according to relevance under their circumstances. To analyze the benefits perceived and constraints experienced in utilization of ICT service, quantification of data was done by first ranking the benefits perceived and constraints experienced based on the responses obtained from the respondents and then calculating the Rank Based Quotient (RBQ) (Sabarathnam, 1988), which is as follows:

$$R.B.Q. = \frac{\sum fi(n + 1 - i)}{N \times n} \times 100$$

Wherein,

fi = Number of respondent reporting a particular benefit/ constraint under *i*<sup>th</sup> rank

N = Number of respondents

n = Number of benefit/constraint identified

The correlation co-efficient was used to study relationship between socio-personal characteristics of the respondents and frequency with which the farmers used the information services of ICT. Selected respondents were interviewed personally using well-structured and pre-tested interview. Statistical tools such as standard deviation (SD), percentage analysis and ‘t’ test were used wherever required.

**RESULTS AND DISCUSSION**

*Socio-economic Profile of Respondents* : Socio economic characteristics of respondent farmers using ICT services were analysed and presented in Table 1.

Table 1. Distribution of respondents based on their socio economic characteristics (N=75)

S. No.	Variables	No.	%
1.	Age (in years)		
	Young (<25)	29	38.67
	Middle (25-40)	35	46.67
	Old (>40)	11	14.67
2.	Education		
	Functional literate (up to middle)	38	50.67
	Secondary	32	42.67
	Graduate and above	5	6.67
3.	Mass media exposure		
	Low	19	25.33
	Medium	23	30.67
	High	33	44.00
4.	Innovativeness		
	Low	17	22.67
	Medium	32	42.67
	High	26	34.67
5.	Use of ICTs		
	Frequently	38	50.67
	Occasionally	24	32.00
	Seldom	13	17.33
6.	Size of land holding		
	Marginal	27	36.00
	Small	31	41.33
	Medium	10	13.33
	Large	7	9.33

The table indicated that majority (46.67 %) of the respondents belonged to middle age group followed by young age (38.67 %) and old age (14.67 %) group. The frequency distribution was highly skewed towards the younger respondents. This means that more young people are getting involved in making use of ICT services for agricultural. While looking at the educational status of respondent, results revealed that majority (50.67 %) of respondents were functionally literate (up to middle class) followed by high school (42.67 %) and graduate and above (6.67 %). Given the respondents’ low level

of education, it is an advantageous to provide ICT services in Hindi and other regional language.

Out of total 75 respondents under study, 44.00 per cent had a high exposure to the mass media followed by 30.67 per cent and 25.33 per cent had medium and low exposure to the mass media, respectively. As it could be seen in Table 1 that the education level of respondent farmers was low but they had medium to high level exposure to mass media. Further, it was observed that majority of respondents were innovative from medium (42.67 %) to high (34.67 %) extent. Results on land holding demonstrated that nearly 77.00 per cent of respondents were small (41.33 %) to marginal (36.00 %) farmers. The results also show that among the respondents using ICT services nearly 50.67 per cent of farmers used the ICT services frequently as and when they needed information. The results of this study are in conformity with those of *Meera et al. (2004)*.

*Information need of farmers:* The main focus of ICT application in agriculture is to meet the information need of farmers. Here, therefore, an attempt was made to find out agricultural information that was considered

relevant to the need of the farmers under their socio economic and biophysical circumstances (Table 3).

Information on weather factors like rainfall, temperature and humidity was considered most appropriate by majority (49.33 %) of respondent while about 30.67 per cent respondent farmers rated it as appropriate. Looking forward to the importance of improved crop production and management practices around 54.67 per cent of farmers felt that information regarding the best packages of practices for various crops cultivated in the area, particularly vegetable was most appropriate. The information relating to the availability of agricultural inputs and input prices was perceived as less appropriate by majority (48.00 %) of farmers. Giving due consideration to importance of early warning and management of pest and disease a sizeable portion (52.00 %) of sample of farmers perceived information on early warning systems about outbreaks of disease and pest infestation, and information about how to manage such outbreaks as most appropriate. The farmers perceived market information, including daily updates on the prices of agricultural commodities in the local markets of the surrounding district, as one of the most relevant ICT services. This was seen as most appropriate by 57.33 per cent of farmers, enabling them to sell at those markets where their goods would command the best prices. Majority of the respondent farmers were unaware of the importance and process of value addition to farm products. Hence, they considered information on value addition less appropriate. The information on animal husbandry and dairying was very much needed by majority of farmers and regarded as most appropriately relevant to their need. Detailed information on risk covering including crop insurance, animal insurance and insurance against property were felt to be appropriate information by nearly 44.00 per cent of farmers.

*Perceived benefits :* There was an increasing realization about the potentialities of ICT in agricultural technology dissemination. The farmers came to regard the ICT as an important source of information on agriculture and allied area for all with their own perception and priorities.

The results presented in the Table 3 revealed that direct access to information was emerged as important benefit and based on RBQ value (72.66) given highest

Table 2. Appropriateness information perceived by farmers (N=75)

Items	Response					
	Most Appropriate		Appropriate		Less Appropriate	
	No.	%	No.	%	No.	%
Weather information	37	49.33	23	30.67	15	20.00
Production practices	41	54.67	21	28.00	13	17.33
Input price	16	21.33	23	30.67	36	48.00
Plant protection measures ment	39	52.00	27	36.00	9	12.00
Farm produce price	43	57.33	26	34.67	6	8.00
Value addition	19	25.33	23	30.67	33	44.00
Live stock management	27	36.00	31	41.33	17	22.67
Risk covering	23	30.67	33	44.00	19	25.33

priority. The next most frequently mentioned priority was more subject matter coverage. ICT services perceived able to disseminate knowledge intensive information like market intelligence, weather forecast, early warning and management of disease and pests, production practices, post harvest management etc. The third priority was minimise time and distance barriers through linking knowledge systems and breaking working hours barriers. It was reported by the respondent farmers that ICT improve the quality of decision making though providing alternative solutions to a set of problematic situation.

Table 3. Perceived benefits of ICT by farmers (N=75)

Benefits	R.B.Q	Overall Rank
Direct access to information	72.66	I
Reliable and timely information	62.46	V
More subject matter coverage	68.23	II
Minimise time and distance barriers	66.68	III
Reduction in transaction cost	66.03	IV
Improve the quality of decision making	46.47	VI

Table 4. Constraints experienced by the farmers (N=75)

Constraints	R.B.Q	Overall Rank
Insufficient regional specific information	67.36	I
Inadequate facilitator's knowledge	49.71	III
Lack of infrastructure facilities	46.82	IV
Inadequate internet connectivity	63.54	II

*Constraints experienced* : Utilization of ICT service in agriculture and rural development is in the takeoff stage and farmers experienced many problems. Preferential ranking technique was utilized to identify the constraints experienced by the respondent farmers in ICT utilization. Based on the ranks given by the respondent farmers for the different constraints experienced by the farmers, the rank based quotients were calculated and presented in Table 4. Among the various constraints experienced by the respondent farmers in utilization of ICT, insufficient regional specific information emerged as most prominent constraint and based on RBQ value (67.36) given highest priority. It

was reported by the respondents that majority of knowledge centre uploaded information in English language. More than half of respondents expressed irregular internet connectivity as one of the major constraints and as per RBQ value (63.54) rated as second most prominent constraint. The poor knowledge of facilitator about subject matter and inadequate infrastructure facility like power supply and internet facility in rural area were perceived constraints by respondent farmers in make best use of ICT services. Similar constraint in utilization of ICT in agriculture and rural development by farmers were also reported by *Adhiguru et al. (2003)*.

*Factors conducive to use of ICT services*: The frequency with which the farmers used the ICT services was correlated with a few socio-personal variables such as age, education and land holding, innovativeness and mass media exposure. It was found that the age of a respondent correlated negatively with frequent use of the internet services in all three projects (Table 5). It was also found that education was positively associated with frequent use of information services. Another interesting feature was observed that landholding was not associated at all with the frequency of using ICT services, indicating that all farmers, irrespective of their landholding size, were using them. It means that farmers' landholding size has no bearing on their frequency of use of ICT services. It was observed that exposure of farmers to mass media was found conducive to utilization of ICT by farmers. The respondent's level of innovativeness also significantly and positively influenced the use of ICT services by farmers.

Table 5. Factors associated with use of ICT services by farmers (N=75)

Factors	Correlation coefficients ('r' value)
Education	0.632*
Age	-0.326*
Landholding	0.027
Innovativeness	0.472*
Mass media exposure	0.368*

\* Significant at 5 % probability level

## CONCLUSION

The application of ICT in agriculture has emerged

an important pillar of agriculture extension focusing on the enhancement of agricultural and rural development through improved information and communication processes. Effective utilization of ICT has potential

to make the rural communities prosperous as it enables the dissemination of requisite information in user-friendly form, easy to access, cost-effective ways at the right time.

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