

ATTITUDE OF EXTENSION PERSONNEL TOWARDS APPLICATIONS OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN AGRICULTURE

S.R. Verma*, F.L. Sharma**, Kesar Chayal*** and M.K. Kaushik****

ABSTRACT

Now a days the importance of information and communication technologies in agriculture are very great and it plays important role and speeded the potential of extension personnel to reach the farmers. Therefore, the present investigation was conducted in Udaipur district of Rajasthan. The state department of agriculture extension was purposively selected as a government organization and eight non-government organizations which were using ICTs for technology transfer were also selected from Udaipur district. A total of 160 respondents (80 from GO and 80 from NGOs) were included in the sample of study. Results of the study indicated that most of the respondents had positive attitude towards various aspects of information and communication technology application in agriculture. It was found that NGOs respondents possessed slightly more favourable attitude than GO respondents about application of ICTs in agriculture.

INTRODUCTION

Now a days transition from a subsistence based agriculture economy to a market oriented farming system has begun and the burden of managing the challenge of change seems manifold for agriculture development organizations. The agriculture and allied sector is estimated to contribute approximately 13.9 per cent of India's GDP (at constant 2004-05 prices) during 2011-12 as per advance estimate released by CSO. The combined efforts of government, non-government organizations and the farming community have succeeded in achieving record production of 250.42 million tones of food grains during 2011-12. This record production has been achieved through effective transfer of latest crop production technologies to farmers with the help of ICTs. In the transfer of technology work information and communication technologies have played important role and speeded the potential of extension personnel to reach the farmers.

It has been reported in many studies and literature that the attitude of an individual plays a significant role in the adoption or rejection of an

innovation. The success or failure of any programme or activity to a large extent depends upon the favourable attitude of its clientele towards the proposed programme. Modern information and communication technologies have the potential to bypass several stages and sequences of adoption process. In earlier decades these technologies have proved their potentialities in term of accuracy, cost effectiveness, speed, quality, quantity and timeliness. Therefore, it was felt necessary to study the attitude of extension functionaries towards ICT application in agriculture. Keeping in mind the enormous scope of ICT application in agriculture the entire study was undertaken with the following objective:

1. To study the attitude of extension personnel towards application of information and communication technologies in agriculture.

RESEARCH METHODOLOGY

The present study was conducted in Udaipur district of Rajasthan. The state department of agriculture extension was purposively selected for the study as a government organisation and eight

* Programme Assistant, Krishi Vigyan Kendra, Bundi.

** Professor, Department of Extension Education, RCA, MPUAT, Udaipur

*** Assistant Professor (H. Sc.), Krishi Vigyan Kendra, Bundi.

**** Professor, Department of Agronomy, RCA, MPUAT, Udaipur

non-government organizations working in agriculture and using ICTs for technology dissemination were also selected from Udaipur district. To select a sample of respondents from the GO, 80 extension functionaries were selected on the basis of random sampling technique. Likewise, from eight selected NGOs, 80 extension functionaries were taken on the basis of proportionate sampling procedure. Consequently, a total of 160 respondents (80 from GO & 80 from NGOs) were included in the sample of study. For the purpose of study five commonly used ICT tools namely computer, internet, mobile phone, kishan call centers and information kiosks were selected. The data were collected through developed instrument, thereafter the data were analysed, tabulated and interpreted. The major findings of the study are as follow.

RESULTS AND DISCUSSION

a. Distribution of respondents according to their attitude towards ICT application in agriculture

An effort was made to know the level of attitude towards information and communication technology application in agriculture, the respondents were grouped into three categories viz, most favourable (above 129.40), favourable (108.82 to 129.40) and least favourable (less than 108.82). This stratification was based on the calculated mean and standard deviation of attitudinal scores obtained by the respondents.

The distribution of respondents in each group is presented in Table 1.

The data incorporated in Table 1 reveal that out of total 160 respondents, 56.87 per cent had favourable attitude towards ICT application in agriculture. Whereas, 25.63 per cent of total extension personnel had most favourable attitude and 17.50 per cent respondents possessed least favourable attitude towards ICT application to agriculture. It means that majority of the respondents had positive and favourable attitude towards ICT application to agriculture.

Further analysis of Table 1 shows that 61.25 per cent GO and 52.50 per cent NGOs respondents had favourable attitude towards ICT application to agriculture.

Table 1: Distribution of respondents according to their attitude towards ICT application in agriculture n = 160

S. No.	Degree of Attitude	GO Personnel		NGOs Personnel		Total	
		f	%	f	%	f	%
1.	Least favourable (<108.82)	17	21.25	11	13.75	28	17.50
2.	Favourable (108.83 to 129.40)	49	61.25	42	52.50	91	56.87
3.	Most favourable (>129.40)	14	17.50	27	33.75	41	25.63
Total		80	100.00	80	100.00	160	100.00

f = Frequency, % = Per cent

The percentage of respondents in other two categories i.e. most favourable and least favourable varied for both GO and NGOs respondents. It was found that 17.50 per cent GO respondents and 33.75 per cent NGOs respondents expressed most favourable attitude towards ICT application in agriculture.

Similarly 21.25 per cent GO and 13.75 per cent NGOs respondents expressed least favourable attitude towards ICT application in agriculture. Hence, it may be inferred that majority of extension functionaries had positive attitude towards ICT application to agriculture in the study area. The present findings concur with the findings of Meera and Jhamtani (2004).

b. Aspect wise attitude of extension functionaries towards ICT application to agriculture:

To find out attitude of the respondents about ICTs total thirty six statements were considered to measure the attitude of extension functionaries towards different aspects of ICT application to agriculture. For this, Mean Percent Score (MPS) for each statement was calculated and ranked accordingly.

The results are presented in Table 2 reveals that most of the GO and NGOs extension functionaries strongly agreed with the fact that mobile phone is an effective tool to reach the target farmers with 91.75 and 89.75 per cent and was ranked first and second by GO and NGOs respondents

respectively. This was followed by the statement that mobile phone reduces the social isolation among farming communities which was highly ranked by GO and NGOs respondents with 87.50 and 87.25 MPS respectively. Strong positive opinion expressed by both the categories of respondents about these aspects may be due to the fact that large numbers of farmers even marginal and small farmers had regularly contacted extension personnel through mobile phone. The contact through mobile phone is reducing the gap that existed between extension officers and farmers earlier.

The data further show that majority of the GO and NGOs respondents strongly agreed with the statement internet is a good tool for strengthening linkages between agriculture and allied departments with 81.50 and 90.50 MPS and ranked sixth and first respectively. Similarly 90.50 per cent of the GO respondents and 77.75 per cent NGOs respondents strongly agreed with the statement computer speeded the reporting process in the organizations. This aspect was ranked second and eleventh by GO and NGOs respondents respectively in the hierarchy order. Likewise, majority of the extension personnel i.e. 79.75 and 86.25 per cent of GO and NGOs respectively positively agreed with the statement that voicemail is an effective technology to arouse interest about new agricultural technologies. It was ranked seventh and sixth by GO and NGOs respondents respectively.

Further analysis of Table shows that majority of GO and NGOs extension functionaries strongly agreed with the positive statement that computer literacy is necessary for internet browsing with 77.75 and 87.50 MPS and ranked eleventh and third respectively. Similarly, the statements entitled portable hard disk and pen drives are comfortable data traveling tools, KCC provides information in local language, computer is effective tool for organizing trainings to the farmers, internet enhance decision making capacity of extension workers, AGMARKNAT is reliable website for accessing market information, computer is powerful means for capacity building of farming community and ICT facilitate farm planning by providing early weather forecasting were also positively viewed by the GO

and NGOs extension workers. The extent of attitude regarding these statements viewed by the GO respondents was 78.25, 87.25, 78.75, 64.00, 72.50, 55.75 and 70.50 per cent respectively whereas, opinion of NGOs respondents about these statements were 86.50, 73.75, 80.25, 81.50, 69.00, 81.00 and 63.75 per cent respectively.

Table also shows that the negative statements entitled computer cannot be used as data storage bank was strongly denied by the GO and NGOs extension functionaries with the extent of 78.25 and 76.75 per cent respectively. Strong disagreement with this aspect may be due to the reason that the computer is well known to all extension functionaries for huge storage of data and information. Similarly, the negative statements namely, cell phone does not facilitate networking among the farming community and computer is not a good source for offline agriculture content were also strongly rejected by both the categories of respondents. These statements were ranked eleventh and thirteen respectively by the respondents.

The statement namely, information kiosks are not effective in satisfying the farmer's need was also negatively viewed by the GO and NGOs respondents with 48.50 and 51.50 per cent respectively. It was further noted that majority of the GO and NGOs respondents disagreed with the negative statement CD-ROMs developed on agriculture technologies are not useful to the farmers with 74.50 and 60.25 MPS respectively which indicates that CD and DVDs developed by ICAR are very important for extension personnel. It was observed that most of the respondents of GO and NGOs expressed favourable attitude towards the statement ICTs can reduce vulnerability of the farming community with 65.75 and 68.50 per cent respectively.

Further examination of data illustrates that majority of the respondents were found to be disagreement with the negative statements like computer is not helpful for extension workers to take quick decision about farming practices, extension functionaries do not consider KCC as a credible source of information, internet cannot ensure accuracy of information, internet cannot

Table 2. Attitude of extension functionaries towards ICT application in agriculture **n=160**

S. No.	Statements	GO		NGOs		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	ICT facilitate farm planning by providing early weather forecasting.	70.50	16	63.75	22	67.12	17
2.	Wider ratio of the farmers to the extension worker (1000:1) cannot be bridged by using ICTs.	51.50	29	64.25	19	57.87	28
3.	ICTs can reduce vulnerability of the farming community.	65.75	17	68.00	16	66.87	18
4.	ICTs are unable to meet the increasing demands of peasantry.	57.25	27	61.5	23	59.37	26
5.	ICTs facilitate resource management and mitigation of environmental risks.	62.00	22	64.25	20	63.12	22
6.	Effective agriculture policy cannot be formulated by inviting suggestions through ICTs.	35.75	35	55.25	28	45.50	33
7.	Computers speed up the reporting process in the organizations.	90.50	02	77.75	11	84.12	04
8.	Computer is not capable for solving agriculture related problems.	59.25	24	48.50	33	53.87	30
9.	Computer is effective tool for organizing trainings to the farmers.	78.75	08	80.25	10	79.50	09
10.	Computer cannot be used as data storage bank.	78.25	09	76.75	12	77.50	10
11.	Computer is powerful means for capacity building of farming community.	55.75	28	81.00	09	68.37	15
12.	Computer is not a good source for offline agriculture content.	77.50	12	64.00	21	70.75	13
13.	Portable hard disk and pen drives are comfortable data traveling tools.	78.25	10	86.50	05	82.37	07
14.	Computer is not helpful for extension workers to take quick decision about farming practices.	65.50	19	65.50	17	65.50	19
15.	Computer literacy is necessary for internet browsing.	77.75	11	87.50	03	82.62	06
16.	CD-ROMs developed on agriculture technologies are not useful to the farmers.	74.50	13	60.25	25	67.37	16
17.	Internet enhance decision making capacity of extension workers.	64.00	20	81.50	08	72.75	12
18.	Internet cannot ensure accuracy of information.	62.25	21	59.75	26	61.00	23
19.	Internet is a tool for strengthening linkage between agriculture and allied departments.	81.50	06	90.50	01	86.00	03
20.	Internet cannot help in risk management for profitable farming.	57.75	26	50.75	30	54.25	29
21.	Internet is a means of passing leisure time for extension workers.	60.25	23	61.00	24	60.62	24
22.	Agricultural websites are not good source of information for field functionaries.	59.00	25	58.25	27	58.62	27
23.	AGMARKNAT is reliable website for accessing market information.	72.50	14	69.00	15	70.62	14
24.	Poor internet connectivity in the rural areas restrict the application of ICT in agriculture.	29.25	36	35.75	35	32.50	36
25.	Mobile phone reduces the social isolation among farming communities.	87.50	03	87.25	04	87.37	02
26.	Internet cannot facilitate the extension functionaries to access global market information.	50.50	30	69.25	14	59.87	25
27.	Mobile phone is an effective tool to reach the target farmers.	91.75	01	89.75	02	90.75	01
28.	Cell phone does not facilitate networking among the farming community.	70.75	15	83.50	07	77.12	11
29.	Voice mail is effective technology to arouse interest about new agricultural technology.	79.75	07	86.25	06	83.00	05
30.	Cell phone is not expensive means for information exchange.	37.75	33	31.50	36	34.62	35
31.	Information kiosks provide professional extension services to the farmers.	48.00	32	49.50	31	48.75	32
32.	Information kiosks are not effective in satisfying the farmers needs.	48.50	31	51.50	29	50.00	31
33.	KCC provide information in local language.	87.25	04	73.75	13	80.50	08
34.	Field functionaries have very poor acquaintance with operating the information kiosks.	36.25	34	49.25	32	42.75	34
35.	Due to busy network of KCC farmers have to wait for long time for getting the advice from KCC experts.	65.70	18	64.5	18	65.1	20
36.	Extension functionaries do not consider KCC as a credible source of information.	85.50	05	44.25	34	64.87	21

MPS = Mean Per cent Score

 $r_s = 0.83^{***}$

facilitate the extension functionaries to access global market information, agricultural websites are not

good source of information for field functionaries, internet cannot help in risk management for

profitable farming. The extent of attitude regarding these statements among the GO respondents was 65.50, 85.50, 62.25, 50.50, 59.00 and 57.75 per cent respectively. In case of NGOs respondents it was 65.50, 44.25, 59.75, 69.25, 58.25 and 50.75 per cent respectively. The disagreement of the extension personnel with these statements may be due to the fact that at the present time computer, internet and kishan call center have become the major source of agriculture information. These ICT tools are helpful in providing quick and right information in the field of agriculture.

Table further shows that statements namely effective agriculture policy cannot be formulated by inviting suggestions through ICTs, field functionaries have very poor acquaintance in operating the touch screen information kiosks, cell phone is not expensive means for information exchange, poor connectivity in the rural areas restrict the application of ICT in agriculture were considered as least by both the categories of the respondents and were placed at the bottom in the ranking hierarchy.

Thus, from the above discussion it can be concluded that most of respondents had positive attitude towards various aspects of information and communication technology application to agriculture. It evidently proves the fact that ICTs are very beneficial to the farming communities and have power to revolutionize agriculture extension system of the country. It was further inferred that NGOs respondents possessed slightly more favourable attitude than GO respondents.

The rank order correlation co-efficient was calculated between the ranks assigned by GO and NGOs respondents to different aspects of attitude about ICTs. The calculated value of rank order correlation was 0.83 which was found to be statistically significant at 1 per cent of level of significance. Thus it was inferred that there was a significant correlation between GO and NGOs respondents with regard to ranks assigned to different aspects of attitude towards ICTs.

The present findings are in line with the findings of Hosseini et al. (2009) who revealed that majority of respondents agreed that establishing the open source is an appropriate policy for

extension service in applying ICTs. More than two thirds of extension experts agreed that enhancing the rural telecommunication infrastructure would help extension service in applying the ICTs. A majority agreed that multi stakeholders approach would be an appropriate policy for extension service in applying the ICTs. Extension experts in Iran agreed with the statements that articulating common principles for applying ICTs in rural areas is an appropriate policy to help extension service. Approximately more than three-fourth of respondents agreed that participation of rural population in ICT project planning, implementation and evaluation would help extension service in applying ICTs.

c. Comparison of attitude between GO and NGOs respondents about ICTs application to agriculture

To find out the variation or similarity in the attitude of GO and NGOs respondents regarding information and communication technologies, 'Z' test was applied. The following hypotheses were framed and tested:

NH0: There is no significant difference between GO and NGOs personnel with respect to their attitude towards application of information and communication technology to agriculture.

RH: There is significant difference between GO and NGOs personnel with respect to their attitude towards information and communication technologies application to agriculture.

Data presented in Table 3 show that calculated 'Z' value 0.229 was found to be less than the tabulated value 1.97, which is statistically non-significant at 1 per cent level of significance. So the null hypothesis (NH0) "there is no significant difference between GO and NGOs respondents regarding attitude towards ICT" was accepted and research hypothesis (RH) was rejected. From the above results it could be concluded that there was no significant difference in attitude between GO and NGOs respondents regarding ICTs application in agriculture. It means that both the categories of respondents had more or less similar attitude

towards ICT application in agriculture in the study area.

Table 3. Comparison of attitude between GO and NGOs respondents about ICTs application to agriculture

S. No.	Category of respondents	Mean	S.D.	'Z' Value
1.	GO Personnel	118.50	13.46	0.229 ^{NS}
2.	NGOs Personnel	119.60	5.60	

NS: Non Significant

Further analysis of table reveals that mean value of NGOs personnel's attitude towards ICT is a little higher than the GO personnel, which indicates that NGOs functionaries had slightly more positive attitude than GO functionaries about ICT application in agriculture. It might be due to the fact the NGOs functionaries had more knowledge and used ICT more than GO functionaries.

CONCLUSION

The findings indicated that most of the respondents had positive attitude towards various aspects of information and communication technology application in agriculture. It evidently

proves the fact that ICTs are very beneficial to the farming communities and have power to revolutionize agriculture extension system of the country. It was further inferred that NGOs respondents possessed slightly more favourable attitude than GO respondents. Results also inferred that there was a significant correlation between GO and NGOs respondents with regards to ranks assigned to different aspects of attitude towards ICTs. The results of investigation also indicated that there was no significant difference in attitude between GO and NGOs respondents regarding ICT application in agriculture. It means that both the categories of respondents had more or less similar attitude towards ICT application in agriculture.

REFERENCES

- Panjabi, N.K. 1997. An analysis study on management and people's participation in social forestry programme in Udaipur district, Rajasthan. Ph.D. thesis submitted to Rajasthan Agriculture University, Bikaner.
- Meera, S.N. and Jhamtani, A. 2004. Future projections of use of information technology in agriculture development in India. *Indian Journal of Extension Education* 40:1-7.

