



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(11): 1928-1932
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www.thepharmajournal.com

Received: 12-08-2023
Accepted: 17-09-2023

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Farmer's attitude towards ICT in transfer of technology in Kota district of Rajasthan

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Abstract

In developing nations, the information and communication technologies (ICTs) have the potential to close the gap between those who have access to information and those who do not. The focus of this study was on farmers' attitude towards ICT in transfer of technology in Kota district of Rajasthan. Multistage sample technique was used in the selection of 399 farmers as a sample for the study. A well-structured interview schedule was used to elicit information from the respondents. The data were analyzed using appropriate statistical tools. The findings were revealed that majority of the farmer respondents (47.62 percent) belonged to middle age group (36 to 58 years) and completed middle school level education, possessing small size of land holding, had annual income more than Rs. 497160, having medium level of innovativeness, mass media exposure, social participation, extension contact, achievement motivation and majority of the respondents had medium level of agricultural progressiveness. The research findings showed that majority of the respondents (69.18%) were having favourable attitude towards ICT.

Keywords: Agriculture, extension, farmers, knowledge, attitude, information and communication technology

Introduction

Farmers' positive attitude towards ICT is very important to receive the benefits of an effective and efficient information support tool that would lead to stronger conviction and efficient planning of extension programs in a changing agri-rural environment. Harnessing the benefits of information and communication technologies (ICT) in agriculture remains an ongoing challenge. The importance of ICT is not in technology per se, but rather in the way it makes knowledge, information, and communication accessible—all important components of today's social and economic interactions. All information-dependent human activities, including rural development and more, are changing as a result of ICT, particularly the internet. The Internet is accessible to the general public, is decentralized, inexpensive, and allows for the production and exchange of information.

The least able to obtain knowledge and information needed to operate effectively in a changing global environment are farmers. Focus must be placed on the Internet, as portals there can offer agricultural information. Through the rural portal, farmers can receive comprehensive information about soil, weather, fertilizers, pest control, and cropping strategies tailored to their respective fields. They can also receive information about where to purchase nursery plants or the appropriate seeds. There are some agricultural portals that provide information about this free of charges eg. Farmers' Portal, mKisan portal and Kisan Suvidha. However, some portals have reinterpreted farming as a business. Through e-commerce like: Iffcobazaar, Agrikart, Agrikendra and Kisanestore, Bighaat, Krushikendra etc. which would be useful for the trading community. Some farming portals have formed multiple alliances to offer a wide range of services to the trading community. These sites would not completely weed out the middlemen but would reduce the number of the existing 7 or 8 tiers to around 2 tiers. Due to the daily fluctuations in commodity prices, some of the agribusiness portals have been launched to provide trading participants with high-quality market research and data to improve their capacity for making decisions. These portals offer news on agricultural commodities, varieties and their agronomic operations, weather, pest and disease news, information on agricultural commodity prices in various national and international markets, and details about the cargo market, among other things. Since information and communication technologies are useful for disseminating the information required at the right time in a user-friendly, easily

accessible and cost-effective manner, they have the potential to contribute to the prosperity of rural communities. Information and communication technology (ICT) is thought to be a potent tool for accelerating the development of knowledge societies in developing countries' rural areas. (Meera *et al.* 2004) [7]. ICT administrations give basic admittance to the information, data and innovation that ranchers need to work on the efficiency and consequently work on the nature of their lives and vocations. (Nandeesh, 2016) [9]. As ICT has a growing role in agricultural extension, more systematic research is called for in the exploration and analysis of ICT applications. ICT services provide critical access to the knowledge, information and technology that farmers require to improve the productivity and thus improve the quality of their lives and livelihoods.

In the light of this, "Farmers' Attitude towards ICT in Transfer of Technology in Kota District of Rajasthan" must be looked into with a view to analyze their attitude towards ICT as a source of information. Here, an attempt has been made to analyze the responses of the farmers towards ICT as a reliable source of information about agricultural commodities, weather, pest and disease news, information about the cargo market, news about agricultural commodities, and information about varieties and their agronomic operations. It is therefore, desirable that conducted a study entitled "A Study on Farmers' Attitude towards ICT in Transfer of Technology in Kota District of Rajasthan" was conducted in the year 2021-2022. In this background the present study was undertaken with the following objective: A study on attitude of farmers towards ICT as a source of agricultural information in the study area.

Methodology

The research was carried out in Rajasthan's Kota district to analyses "the farmers' attitude towards ICT in transfer of technology". Farmers who used ICT tools and services made up the study's population. Through the use of a multistage sampling technique, 399 farmers were chosen as respondents for the study area. A carefully designed and tried-and-true interview schedule was used for in-person interviews with the chosen respondents. Statistical tools were used wherever required. A five-point continuum with the following responses: strongly agree, agree, undecided, disagree, and highly disagree were assigned 5, 4, 3, 2, and 1 scores, respectively. The minimum score was 33, and the maximum score was 165. This was done in order to measure each respondent's profile as a farmer and to categorize them based on the calculated minimum and maximum scores obtained by the respondents. Each respondent's overall score was computed, converted to a number and a percentage for the proper conclusion, and the respondents were divided into three categories in three categories i.e. Unfavourable, favorable and most favorable. A proportionate random sampling procedure was used to select the sample of respondents, using the formulas of Taro Yamane (1967) [17].

$$N = \frac{N}{1 + N(e)^2}$$

Where;

N = Sample size

N = Population size (140262)

E = Margin of error (5% or .05) at 95% confidence level

Results and Discussion

Socio-economic profile of the respondents: The socio-economic status of farmers plays a key role in productive activities and agricultural development. Socio-economic parameters such as age, education, size of land holding, annual income, mass media exposure, social participation, extension contact, achievement motivation and agricultural progressiveness were considered for the study of demographical profile of the respondents. Studies on these variables attempted not only to explain the overall socio-economic conditions of the farmers, but also identified the factors that influence attitude of farmers and extent of use of ICT and inhibiting the realization of the full potential of agriculture and the appropriate area for government intervention (Sathiadhas and Panikkar, 1988) [13]. The personal, socio-economic and psychological profile of the respondents are presented in Table 1 to Table 10.

Table 1: Distribution of respondents according to their age

(N= 399)

Age	Score	Respondents	
		Number	Percent
Young	Upto 35 years	151	37.84
Middle	Between 36-58 years	190	47.62
Old	Above 58 years	58	14.54
Total		399	100

The data presented in Table 1. revealed that majority of the respondents (47.62 percent) belonged to middle age group (36 to 58 years) followed by 37.84 percent of the respondents belonged to the young age group (upto 35 years) and 14.54 percent of the respondents belonged to old age group (above 58 years). From the above findings the high percentage of respondents who fell into the middle age group can be concluded.

The findings of the study were same as stated in the studies conducted by Vivek (2017) [16] reported that majority of the respondents were belongs to middle age group.

Table 2: Distribution of respondents according to their education level

(N= 399)

Education level	Respondents	
	Number	Percent
Illiterate	19	4.76
Primary education	40	10.03
Middle school	103	25.81
High school	81	20.30
Intermediate	69	17.29
Graduation	61	15.29
Post-graduation and above	26	6.52
Total	399	100

In Table 2, data regarding the level of education the respondent farmers were shown. It was evident that majority of the respondents (25.81 percent) had completed middle school level education followed by 20.30 percent of the respondents who had completed their high school level, 17.29 percent of the respondents were intermediate, 15.29 percent of the respondents had completed graduation level, 10.03 percent of the respondents were educated upto primary level, 6.52 percent of the respondents had completed post-graduation and above only 4.76 percent respondents who were illiterate.

The findings were in line with the findings of Reddy (2019)^[12] and Kavitha (2015)^[5], who reported that majority of the respondents completed middle school level of education.

Table 3: Distribution of respondents according to their size of land holding

(N= 399)

Size of land holding	Score	Respondents	
		Number	Percent
Landless	Below 0.02 hectares	8	2.01
Marginal	Between 0.02 - 1.00 hectares	56	14.03
Small	Between 1.1 - 2.00 hectares	123	30.83
Semi – medium	Between 2.1- 4.00 hectares	94	23.56
Medium	Between 4.1-10.00 hectares	65	16.29
Large	More than 10.000 hectares	53	13.28
Total		399	100

A cursory look at the Table 3 revealed that majority of the respondents (30.83 percent) were possessing small size of land holding followed by semi-medium 23.56 percent, medium 16.29 percent, marginal 14.03 percent, 13.28 percent of the respondents were possessing large sized of land holding and 2.01 percent of the respondents were landless. The possible reasons could be that fragmentation of land holdings and ever increasing of population from one generation to other and also due to converting of agricultural lands into industries and real estates. The results were in accordance with the findings of Naik (2018)^[8] reported that majority of the respondents were possessing small size of land holdings.

Table 4: Distribution of respondents according to their annual income

(N= 399)

Annual income	Respondents	
	Number	Percent
Rs. 74,568 to Rs. 1,24357	2	0.51
Rs. 1,24357 to Rs. 1,86432	66	16.54
Rs. 1,86432 to Rs. 2,48580	116	29.07
Rs. 2,48580 to Rs. 4,97160	96	24.06
More than Rs. 4,97160	119	29.82
Total	399	100

It is clearly exhibited in Table 4. that majority of the respondents (29.82 percent) had annual income more than Rs. 497160 followed by 29.07 percent of the respondents had annual income Rs. 186432 to Rs. 248580, 24.06 percent of the respondents had annual income Rs. 248580 to Rs. 497160, 16.54 percent of the respondents had annual income Rs. 186432 to Rs. 248580 whereas 0.51 percent of the respondents had annual income Rs. 74568 to Rs. 124357. The findings were in congruence with the results documented in various research studies such as Choudhary (2021)^[3] and Kumar (2019)^[6] revealed that majority of the farmers had higher level of income.

Table 5: Distribution of respondents according to their innovativeness

(N= 399)

Innovativeness	Score	Respondents	
		Number	Percent
Low	Between 9-15	31	7.77
Medium	Between 16-21	277	69.42
High	Between 22-27	91	22.81
Total		399	100

The result from the Table 5 indicated that majority of the respondents (69.42 percent) having medium level of innovativeness followed by 22.81 percent of respondents having high level and rest of the respondents 7.77 percent having low level of innovativeness. The possible reasons may be that majority of the respondents had high extension contact with scientists and other extension workers for getting the information about new technology due to this they are quite earlier in adopting the innovations than the other respondents in a social system.

The findings were in congruence with the results documented in various research studies such as Naik (2018)^[8] and Dhaka and Chyal (2010)^[4] observed that majority of the respondents' level of innovativeness were medium.

Table 6: Distribution of respondents according to their mass media exposure

(N= 399)

Mass media exposure	Score	Respondents	
		Number	Percent
Low	Between 0-2	45	11.28
Medium	Between 3-5	207	51.88
High	Between 6-8	147	36.84
Total		399	100

A glance at the Table 6. revealed that majority of the respondents (51.88 percent) having medium level of mass media exposure followed by 36.84 percent of them having high and 11.28 percent having low level of mass media exposure, respectively. This clearly reveals the highly skewed nature of distribution.

The findings of the study were same as stated in the studies conducted by Bipinbhai (2020)^[2] founded that majority of respondents' level of mass media exposure were medium.

Table 7: Distribution of respondents according to their social participation

(N= 399)

Social Participation Level	Score	Respondents	
		Number	Percent
Low	Between 10-16	23	5.77
Medium	Between 17-23	215	53.88
High	Between 24-30	161	40.35
Total		399	100

The majority of respondents (53.88 percent) had a medium level of social participation, as illustrated by the above Table 7 followed by 40.35 percent of them with high level and 5.77 percent of them with low level of social participation.

The results were in confirmation with the results of Naik (2018)^[8] reported that majority of the respondents had medium level of social participation.

Table 8: Distribution of respondents according to their extension contact

(N= 399)

Extension Contact	Score	Respondents	
		Number	Percent
Low	Between 0-12	37	9.27
Medium	Between 13-24	201	50.38
High	Between 25-36	161	40.35
Total		399	100

The above Table 8 illustrated that majority of the respondents (50.38 percent) had medium level of extension contact followed by 40.35 percent of the respondents had high level and 9.27 percent of the respondents had low level of extension contact.

The results were in accordance with Naik (2018) [8] revealed that majority of the respondents belong to medium level of extension contact.

Table 9: Distribution of respondents according to their achievement motivation

(N= 399)

Achievement Motivation Level	Score	Respondents	
		Number	Percent
Low	Between 12-28	47	11.78
Medium	Between 29-44	231	57.89
High	Between 44-60	121	30.33
Total		399	100

Table 9. indicated that majority of the respondents (57.89 percent) had medium level of achievement motivation followed by 30.33 percent of the respondents had high level of achievement motivation and 11.78 percent of the respondents had low level of achievement motivation.

The findings were similar to the study of Bhattacharjee *et al.* (2021) observed that majority of the respondents had medium level of achievement motivation.

Table 10: Distribution of respondents according to their agricultural progressiveness

(N= 399)

Agricultural Progressiveness Level	Score	Respondents	
		Number	Percent
Low	Between 24-62	58	14.54
Medium	Between 63-101	214	53.63
High	Between 102-140	127	31.83
Total		399	100

Table 10 indicated that majority of the respondents (53.63 percent) had medium level of agricultural progressiveness followed by 31.83 percent of the respondents had high level of agricultural progressiveness while 14.54 percent of the respondents had low level of agricultural progressiveness.

The results were in confirmation with the results of Priya and Mitra (2020) [10].

Attitude of farmers towards ICT as a source of agricultural information.

Farmers’ attitude towards ICT is an important component which is directly related to their knowledge and utilization of ICT services. An attempt was made to find out the response of farmers towards a set of statements of attitude towards ICT and its services with varying degrees of positive and negative impressions. The data on analysis of the attitude of farmers towards the Information and Communication Technology was presented in Table 11.

Table 11: Attitude of farmers towards ICT as a source of agricultural information

(N= 399)

Attitude of Farmers	Score	Respondents	
		Number	Percent
Unfavourable	Between 33-77	54	13.53
Neutral	Between 78-121	69	17.29
Favorable	Between 122-165	276	69.18
Total		399	100

From the Table 11 depicted that majority of the respondents (69.18 percent) were having favorable attitude towards ICT followed by 17.29 percent of the respondents had neutral attitude and 13.29 percent of the respondents had unfavourable attitude towards ICT as a source of information respectively.

The possible reasons might be that the respondent farmers had high level of income and had good knowledge and awareness about ICT tools and services with proper utilization in agricultural practices and getting timely reliable information, easy access to marketing information, easy contact with customers, promote interpersonal relationship, update knowledge, and increase efficiency and some of the farmers had high levels of achievement motivation, social participation and innovativeness etc. which fostered a positive attitude regarding ICT services. These findings were accordance with the findings of Bipinbhai (2020) [2] who reported in his study “Knowledge, attitude and utilization of information and communication technology services by farmers of Saurashtra region of Gujarat state” that more than two-third of farmers had favorable attitude towards ICT services followed by unfavourable and more favorable attitude towards ICT services, respectively. Similarly, Singh and Kameswari (2019) [14] in their research entitled “Relationship between Characteristics of Farmers and Impact of ICT Enabled Web Portal (Krishinet)” observed that majority of the respondents (61.78 percent) had positive attitude towards KGK and 21.43 percent respondents had neutral attitude towards KGK. Naik (2018) [8] in his study “ICT tools usage by the farmers in Anantapur district of Andhra Pradesh” also reported that majority of the farmers 73.34 percent had medium level of attitude followed by high attitude 15.00 percent and low 11.66 percent level of attitude.

Similar findings were also reported by Reddy (2019) [12], Rajoria *et al.* (2018) [11], Toluwase and Apta (2017) [15], who observed that majority of the respondents were having favorable attitude.

Conclusion

The use of ICT in agriculture has become an important pillar of agricultural extension, which focuses on improving agricultural and rural development through improved information and communication processes. The effective use of ICT has the potential to make rural communities prosperous by enabling the dissemination of needed information in a user-friendly, easily accessible, cost-effective way at the right time. Empirical result of the research findings concluded that 69.18% percent respondents having favorable and positive attitude towards ICT as a source of agricultural information. Therefore, by offering sufficient, timely, and helpful information as well as expertise in using ICT tools, consultants should work to increase the credibility of ICT. They are able to use ICT tools and cultivate a favorable attitude toward ICT use as a result. The result of the research study also illustrated that majority of the respondents belonged to middle age group (35 to 58 years), middle school level of education, and majority of the respondents were possessing small size of land holding, and had annual income more than Rs. 497160. It was noted that the majority of respondents had medium level of innovativeness, mass media exposure, social participation, extension contact, achievement motivation and also had medium level of agricultural progressiveness. Based on these results, it is important to promote the use of ICT tools at rural level through some

measures such as: ICT infrastructure development, training on ICT tools use towards farmers, especially smallholder for setting market information. The potential of ICT in distributing agricultural technologies among farmers is becoming more widely recognized. Stronger conviction and more successful extension program planning would result from ICT's use as an efficient and effective information support tool.

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