

## UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES BY THE FARMERS

**P. B. Khodifad<sup>1</sup> and A. V. Solanki<sup>2</sup>**

<sup>1</sup> Asso. Prof., Dept. of Agril. Extension and Communication, N. M. College of Agriculture, NAU, Navsari - 396450

<sup>2</sup> Ex-P. G. Student, Dept. of Agril. Extension and Communication, N. M. College of Agriculture, NAU, Navsari - 396450

Email: pbkhodifad@nau.in

### ABSTRACT

*Information and communication technologies (ICTs) can help farmers access the information they need. Nowadays, an array of ICTs tools and projects are available not only in urban areas but in rural areas also. However effective utilization of ICTs for accessing agricultural information by the farmers is the major concern as generally, people use them more for entertainment and time passing. To what extent the farmers are using the ICTs in accessing agriculture information is fundamental for redesigning the agricultural development projects integrating the ICTs. Keeping this in view, the study was undertaken to ascertain the extent of the use of ICTs for accessing agricultural information by the farmers of South Gujarat. The study was carried out in the Valsad and Navsari districts of Gujarat for 120 farmers. Multistage random sampling was adopted for the selection of respondents. An Ex-post-facto research design was used for the study. Results of the study indicated that the majority (62.50 percent) of the respondents had a moderate level of extent of utilization of ICTs followed by 19.17 and 18.33 percent of them had high and low extent of utilization, respectively. Out of the 14 factors studied, education, extension participation, training received, mass media exposure, information source accessibility, innovativeness, social participation, and economic motivation were found positively and highly significantly correlated with the extent of use of ICTs.*

**Keywords:** correlation, farmers, ICTs, south gujarat, utilization

### INTRODUCTION

Agriculture is the mainstay of the Indian economy. The Indian agriculture sector contributes about 18 percent of India's gross domestic product (GDP) and employs 50 percent of the country's workforce in the financial year 2018-19 (Doli and Divya, 2020). The development of the Indian economy relies on the development of the agricultural sector and it is only possible to provide the farmers latest technological and information support to the farmers. Agricultural information and advisory services are key components for the development of agriculture. For providing accurate, timely, relevant information and services to the farmers, thereby facilitating an environment where agriculture occupation is very necessary (Pratik and Vinaya, 2021 & 2022). At present the extension personnel in the Department of Agriculture has the major responsibility of transferring technologies to the farming community from time to time. The extension personnel of the Department of Agriculture is disseminating the technological messages to the farmers manually. But this approach has not been able to reach the majority of the farmers who are spread across the whole country. The solution to this problem is that there should be an efficient delivery system through which farmers get timely, accurate adequate latest agricultural technological information

whenever and wherever they want and this can be done by using information and communication technologies (ICTs). ICTs offer opportunities to reach more people through easy access to local or global information and knowledge.

Nowadays, a range of ICTs are available even in rural areas across the country. Farmers can use these for getting information whenever and wherever they need it. But it is also true that the benefits of ICTs are not harnessed fully in rural areas. The reasons are many. Farmers do have not enough skills and knowledge of using ICTs, for economic problems, technological problems, to some extent social problems, and use ICTs for entertainment and time passing, also. Looking at the advantages of the ICTs in agricultural development there is utmost necessary to promote the use of ICTs among the farming community. There is a need to evolve an efficient system and programs for promoting the use of ICTs. Before implementing the ICTs program there is a need to know how much the farmers are using ICTs presently and what are the problems farmers facing.

### OBJECTIVES

- (1) To ascertain the extent of ICT use for accessing agricultural information by the farmers of South Gujarat

- (2) To work out the relationship of farmers' profiles with the extent of use of ICTs by the farmers for accessing agricultural information

## METHODOLOGY

The present study was undertaken in the Navsari and Valsad districts of Gujarat to know the extent of utilization of ICTs for accessing agricultural information by the farmers of South Gujarat. *Ex-Post-Facto* Research design was used for the study because both the use of ICTs by the farmers of South Gujarat and its effect in accessing agricultural information already happen before this study. According to Robinson (1976), *ex-post-facto research* is a systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulated. All farmers of Navsari and Valsad districts were the population of the study. So, considering the objectives of the study, the amount of data collection, the wideness of the population, the precision of the results needed, the cost of the research; and the time available to the researcher 120 farmers as respondents were selected by employing a multi-stage sampling technique. In the first stage, two taluka from each district; Navsari and Chikhli from Navsari district and Valsad and Dharampur from Valsad were selected randomly. After the selection of talukas, in the second stage, the lists of the villages from each selected taluka were acquired from the respective taluka panchayat, and each list of two villages; Kalwada and Atgam of Valsad talukas, Baroliya and Khatana of Dharampur taluka, Dantej and Kasbapar of Navsari taluka and Agasi and Samroli of Chikhli talukas were selected using the lottery methods. After the selection of villages, separate lists of farmers who resided in the village were prepared and from each village, 15 farmers were selected randomly as respondents of the present study.

The main objective of the present study is to determine the extent of utilization of ICTs by farmers for accessing agricultural information. Therefore, the extent of use of ICTs was studied as a dependent variable. The extent of use of ICTs is variable term varies with its users. So, the most relevant farmers' profile viz; age, education, land holding, occupation other than agriculture, opinion leadership, extension participation, training received, mass media exposure, information source accessibility, innovativeness, scientific orientation, social participation, economic motivation, cosmopolites, knowledge of ICTs and attitude towards ICTs were selected by from reviewing available research and consultation of Student Advisory Committee (SAC) and studied during the course of the present investigation. For measuring the dependent and independent variables appropriate measuring techniques/scales developed

by other scientists were used. In the case of variables for which measuring tools are not available, were measured by pretested structured scale.

After finalizing the research design and interview schedule, the data were collected by using the personal interview method. Collected data were analyzed using statistical tools and tests such as frequency, percentage, mean and correlation coefficient were used and the data was analyzed systematically to draw valid inferences.

### Measurement of the extent of ICTs use for accessing agricultural information by the farmers

The extent of utilization of ICT operationally refers to the degree of utilization of ICTs tools by the respondents for accessing agricultural information. The extent of utilization of ICTs was measured in four dimensions (1) Frequency of use of ICT, (2) Purpose of utilization of ICT tools by the farmers, (3) Duration of ICT utilization (hrs/week), and (4) Preference of ICT utilization as follow:

#### (1) Frequency of use of ICT

Frequency is the rate at which utilization of ICTs occurs or is repeated over a particular period by the respondents. The response had been measured on a six-point continuum viz., Daily, more than two times a week, Once a week, once in a fortnight, occasionally, and never with the score 5,4,3,2,1 and 0. For frequency of usage, Very frequently is defined in terms of its usage of ICTs 'daily,' Frequently in terms of its usage of ICTs 'three times a week' and 'once a week', Occasionally in terms of its usage of ICTs 'once a month', Rarely in terms of usage of ICTs 'once in three months' and 'never' in terms of using ICTs in terms of not using ICTs at all.

#### (2) Purpose of utilization of ICT tools by the farmers

Different tools of ICT might be used for different purposes by the farmers hence the information regarding the purpose of use of ICT tools under study was collected. The category of the purpose of utilization of ICT is categorized into six continuums viz, for knowledge, for transfer of money, for imparting training, for making reports, for sharing with others including input agencies, and for organizational communication with the score 0,1,2,3,4 and 5 respectively.

#### (3) Duration of ICT utilization (Hrs/week)

Determining utilization of ICT tools, in terms of hours devoted by respondents per week for using ICT tools, was presented in terms of frequency and percentage. The category of utilization pattern of ICT per hour is categorized into four categories viz,  $\frac{1}{2}$  to  $2\frac{1}{2}$  hrs,  $2\frac{1}{2}$  to  $5\frac{1}{2}$  hrs,  $5\frac{1}{2}$  to 14 hrs and not utilizing with the score of 4,3,2 and 1 respectively.

**(4) The preference for ICT utilization**

It is a degree to which a greater liking for one alternative over another or others. Preference for the use of ICT was measured in terms of attractiveness, effectiveness, necessity, ease to operate, and clarity with the score of 1, 2, 3, 4 and 5, respectively. The total score of each respondent for preference was calculated accordingly.

**The overall extent of ICTs use**

The overall extent of ICTs use was worked out by summation of scores of four dimensions viz: frequency of use of ICT, the purpose of utilization ICT by the farmers, Duration of ICT (Hrs. /week), and preference of ICT utilization. Based on the score obtained by the respondents, they were classified into three categories viz; (1) low level of extent of use (< 33.00 percent score), (2) medium level of extent of use (33.00 to 66.00 percent score) and (3) high level of extent of use (> 66.00 percent score). The scores obtained by the respondents had been calculated and accordingly, respondents had been categorized by using mean and standard deviation as below:

**RESULTS AND DISCUSSION**

**The Extent of ICTs use by the farmers for accessing agricultural information**

Data regarding the extent of ICTs use by the farmers of Navsari and Valsad districts were collected from the respondents through personal interviews at their farms or home in line with the interview schedule. Collected data were processed and analyzed by employing statistical tools viz; frequencies, percentage, mean, standard deviation coefficient of correlation, and test of significance. Results are presented in percentages in table 1.

**Table 1: Distribution of the respondents according to the overall extent of ICTs use (n=120)**

Sr. No.	Categories of the extent to which ICTs use	Frequency	Percentage
1	Lower	22	18.33
2	Moderate	75	62.50
3	Higher	23	19.17

It was evident from the figure 1 that the majority (62.50 percent) of the respondents had a moderate level of extent of ICTs use followed by only 19.17 and 18.33 percent of them had a higher and lower level of extent of ICT use respectively. In general, the majority (81.67 percent) of the respondents had moderate to high levels of extent of ICTs use. The probable reason for this finding may be that the farmers are aware of the diverse need of their activities and innovative use of ICT tools for their efficient role in the

agricultural extension system. This finding was in line with the findings of Chandravadia and Makwan (2019), Lokeswari (2016), and Swaroop (2016)

**Relationship of farmers’ profile with the extent of ICTs use**

The reviewed literature indicated that the extent of utilization of ICTs by the farmers and its effectiveness for accessing agricultural information-dependent terms and influenced by diverse factors. Among these factors, the profiles of its users affect greatly. The extent of utilization of ICTs and their effectiveness in accessing agricultural information varies with its users. The concern of the present study is the characteristics in what proportion influence the extent of utilization of ICTs and their effectiveness. The correlation coefficient (*r*) and test of significance were worked out to ascertain the relationship between the extent of utilization of ICTs and its effectiveness with selected farmers’ profiles. The results of the correlation were presented in table 2.

**Table 2: Relationship of farmers’ profile with the extent of ICTs use for accessing agricultural information (n=120)**

Sr. No.	Variables	Coefficient of correlation (r)
X <sub>1</sub>	Age	-0.074
X <sub>2</sub>	Education	0.193**
X <sub>3</sub>	Landholding	0.089
X <sub>4</sub>	Occupation other than agriculture	0.090
X <sub>5</sub>	Opinion leadership	0.134
X <sub>6</sub>	Extension participation	0.223**
X <sub>7</sub>	Training received	0.185**
X <sub>8</sub>	Mass media exposure	0.217**
X <sub>9</sub>	Information source accessibility	0.223**
X <sub>10</sub>	Innovativeness	0.241**
X <sub>11</sub>	Scientific orientation	-0.129
X <sub>12</sub>	Social participation	0.200**
X <sub>13</sub>	Economic motivation	0.196**
X <sub>14</sub>	Cosmopolitaness	-0.061

\*\* Significant at 0.01 level

Findings regarding the relationship between the personal profiles of farmers and the extent of use of ICTs revealed that education (0.193), extension participation (0.223), training received (0.185), mass media exposure (0.217), information source accessibility (0.250), innovativeness (0.241), social participation (0.200) and

economic motivation (0.196) had positive and highly significant correlation at 0.01 level of significance with the extent of use of ICTs. Hence null hypotheses of these variables were rejected. It can be inferred that the use of ICTs by the farmer increases with an increase in education, extension participation, training received, mass media exposure, information source accessibility, innovativeness, social participation, and economic motivation of the farmers. These findings conform with the findings of Akter *et al.* (2016), Chauhan (2016), Duhan and Singh (2017), Kumar *et al.* (2017), Patidar (2015), Rebekka and Saravanan (2015), Roy *et al.* (2018),

In contrast to this, land holding (0.089), occupation (0.090), and Opinion leadership (0.134) were found positively and non-significant with the extent of use of ICTs. Whereas, (-0.074), scientific orientation (-0.129), and cosmopolitaness (-0.061) were found negatively and non-significant with the extent of use of ICTs. Hence null hypotheses for these variables were accepted. *It might be summarized that the use of ICTs does not increase with the increase in land holding, occupation, and opinion leadership of the farmers.* Kumar *et al.* (2017) observed similar results for the relationship between landholding and the use of ICTs. Alam and Uddin (2018) observed contrasting results on the relationship between occupation and the use of ICTs. *So far results of the coefficient of correlation between age and use of ICTs,* Wawire *et al.* (2017), Lokeswari, K. (2016), and Chauhan (2016) reported dissimilarly. Kumar *et al.* (2017) observed divergent results of the relationship between scientific orientation and the use of ICTs.

The results of the coefficient of correlation clearly show that farmers' profile viz; education, extension participation, training received, mass media exposure, information source accessibility, innovativeness, social participation, and economic motivation had a positive and significant impact on the extent of ICTs use by the farmers. Improvement in these farmers' profiles, the extent of ICTs use also increased considerably. On the other hand, the extent of ICTs use was found independent of farmers' profile viz; land holding, occupation, opinion leadership. It can be inferred that extent of ICTs use does not change due to changes in these farmers' profiles.

## CONCLUSION

It can be concluded that the majority of the farmers had a moderate level of extent of utilization of ICTs. Among different types of ICTs, farmers are using social media such as Whatsapp and Facebook, and cell phones for getting and sharing agricultural-related information, whereas the use of computers, the internet other ICTs are very rare. So

extension functionaries should focus on social media for disseminating agricultural information. The extent of ICTs use by the farmers is considerably influenced by education, extension participation, training received, mass media exposure, information source accessibility, innovativeness, social participation, and economic motivation. So, these farmers' profiles should be considered while disseminating agricultural information among the farming community.

## ACKNOWLEDGEMENT

We express our deep sense of gratitude to the Hon'ble Vice-Chancellor, Director of Research and Dean, Navsari Agricultural University, Navsari, Principal and Dean, N. M. College of Agriculture, Navsari, and Professor and Head, Department of Agricultural Extension and Communication, N. M. College of Agriculture, Navsari for providing necessary facilities required for the study. We cordially thank the members of the Advisory Committee; Dr. R. M. Pankhaniya (Co-Advisor), Associate Professor, Department of Agronomy, Dr. R. M. Naik, Associate professor, Department of Extension Education, Dr. B. K. Bhatt, Associate Professor, Department of Agricultural Statistics, ASPEE College of Horticulture, N.A.U., Navsari for their guidance and constructive suggestions to me to reach up to this destination.

## CONFLICT OF INTEREST

This is to declare that there is "No conflict of interest" among researcher.

## REFERENCES

- Akter, R., Kafura, M. D., Afrad, S. I., Prodhon, F. A. and Chakraborty, D. B. (2016). Use of ICT as an extension tool by the farmers of Gazipur district in Bangladesh. *Ind. Res. J. Ext. Edu.*, 16(2): 1-5.
- Alam, M. Z. and Uddin, M. R. (2018). Use of information and communication technologies by the farmers in receiving agricultural information. *Res. Agri., Live and Fish.*, 5(1): 27-32.
- Chandravadia, K., and Makwan, A.R. (2019). Use of information and communication technologies by the tribal farm women *Guj. J. Ext. Edu.*, 30(1): 58-59.
- Chauhan, L. S. (2016). A study on the use of information communication technology tools for the transfer of agricultural technology in the Sehore district of Madhya Pradesh. M.Sc. (Agri.) Thesis (Unpublished), R.V.S.K.V.V., Gwalior.
- Doli, M. and Divya, K. S (2020). Study on present Indian

- agriculture: Status, Importance, and Role in Indian Economy. *Zenith Int. J. of Multi.Res.*, 10(1): 30-34.
- Duhan, A. and Singh, S. (2017). Sources of agricultural information accessed by farmers in Haryana, India. *Int. J. Curr. Microbiol. and Appl. Sci.*, 6(12): 1559-1565.
- Kumar, S., Singh, R., Rao, D. U. M. and Chauhan, J. (2017). Information needs of Indian farmers: An elixir for connect and disconnect of agriculture. *Ind. Res. J. Ext. Edu.*, 18(1): 37-44.
- Lokeswari, K. (2016) A study of the use of ICT among rural farmers. *Inter. J. Comm. Res.*, 6(3): 232-238.
- Pratik Kiritkumar Patel and Vinaya Kumar, H. M. (2021). Farmers socio-economic status and constraints using social media for sustainable agriculture development. *Guj. J. Ext. Edu.*, 32 (1): 34-39.
- Pratik Kiritkumar Patel and Vinaya Kumar, H. M. (2022). Predictive Factors for Farmers' Knowledge of Social Media for Sustainable Agricultural Development. *Ind. J. of Ext. Edu.*, 58 (4): 55-59. <http://doi.org/10.48165/IJEE.2022.58412>
- Patidar, R. (2015). A study on the role of online communication in the transfer of agricultural technology. M.Sc. (Agri.) Thesis, J.N.K.V.V., Jabalpur.
- Rebekka, S. and Sarvana, R. (2015). Access and usage of ICTs for agriculture and rural development by the tribal farmers in Meghalaya State of North-East India. *J. Agri. Inf.*, 6(3):24-41.
- Robinson, S. (1976) A Note on the U Hypothesis Relating Income Inequality and Economic Development. *Ame. Eco. Rev.*, 66: 437-440.
- Roy, M. L., Chandra, N., Mukherjee, A., Jethi, R. and Joshi, K. (2018). The extent of use of ICT tools by hill farmers and associated social factors. *Ind. Res. J. Ext. Edu.*, 18 (3): 27-31.
- Swaroop, B. J. (2016). Accessibility and extent of utilization of information and communication technologies in the adoption of improved agricultural practices by farmers in the Visakhapatnam district of Andhra Pradesh. *J. Global Commu.*, 9(Conf.):152-157.
- Wawire, A. W., Wangia, S. M. and Okello, J. J. (2017). Determinants of use of information and communication technologies in agriculture: The case of Kenya Agricultural Commodity Exchange in Bungoma County, *Kenya J. Agri. Sci.*, 9(3):128 – 137.

---

Received : April 2023 : Accepted : May 2023