

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 4; April 2025; Page No. 312-314

Received: 07-02-2025
Accepted: 11-03-2025

Indexed Journal
Peer Reviewed Journal

Relationship between socio-economic parameters of the farmers and extent of utilization of ICT tools for crop practices by the farmers

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DOI: <https://www.doi.org/10.33545/26180723.2025.v8.i4e.1785>

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Abstract

The rural population in India continues to face challenges in accessing vital agricultural information in formats they can easily understand and use for making timely and informed farming decisions. In recent years, several innovative approaches have emerged to address this gap. However, the farming community still struggles with numerous issues that hinder efforts to enhance crop productivity. Although information is available in various forms and serves multiple purposes, there remains a considerable disconnect between research advancements and their practical application on the ground. The study revealed that factors such as education, annual income, social involvement, landholding size, exposure to mass media, occupation, and use of mechanized equipment showed a positive and significant relationship with the level of ICT tool usage at a 1% significance level. On the other hand, variables like age and family size were found to have a negative and statistically insignificant association with the extent of ICT utilization.

Keywords: Information & communication technology, farming, agriculture and constraints

Introduction

The term *Information and Communication Technologies* has been referenced in academic circles since the 1980s. The abbreviation *ICT* gained broader recognition following its use by Dennis Stevenson in his 1997 report to the UK government. According to the World Bank, ICT encompasses any tool, device, or application that facilitates the transmission or collection of data through interaction or communication. This broad category includes technologies ranging from traditional radio to advanced systems like satellite imagery, mobile phones, and digital financial services.

ICT plays a significant role in addressing food security challenges by enabling the timely exchange of reliable information related to weather patterns, agricultural inputs, market conditions, and pricing. It also supports research and development, facilitates knowledge sharing with farmers, and strengthens connections between producers and consumers. These services offer essential access to information, knowledge, and technology that farmers need to enhance their productivity and improve their quality of life.

IFFCO Kisan

"IFFCO Kisan" is a farmer-centric mobile application developed in India to support agricultural decision-making by offering tailored information based on individual needs. This platform assists farmers by delivering updates on

mandi (market) prices, weather forecasts, agricultural advisories, and best practices related to crop cultivation, animal husbandry, and horticulture. Additionally, it serves as a hub for buying and selling agricultural products and offers timely updates on relevant news and government schemes.

Designed with accessibility in mind, the app provides agricultural alerts and expert advice in 11 regional Indian languages, available both in written form and as audio clips, ensuring that farmers can receive information in the language they understand best.

Weather Information: This feature allows farmers to access a five-day weather forecast that includes details on temperature, humidity, rainfall probability, wind speed, and direction for selected locations. Users can set up to two districts as their preferred areas to receive localized forecasts, helping them prepare and take proactive steps for their farming operations. The data is sourced from the India Meteorological Department (IMD).

Market or Mandi Section: Through this section, farmers can view real-time mandi prices for their produce, along with current market trends, trade rates, and volume information. The app also allows users to analyze price fluctuations and access the three most recent updates on commodity transactions, helping them make informed decisions on when and where to sell their produce.

Materials and Methods

The research was carried out in the Jobner Panchayat Samiti, located within the Jaipur district of Rajasthan. Among the 22 Panchayat Samitis in the district, Jobner was purposefully chosen for this study. From this selected Samiti, four gram panchayats were randomly chosen. In each of these gram panchayats, two villages were selected at random, resulting in a total of eight villages. From each village, 15 farmers were randomly selected, forming a sample size of 120 respondents.

The study aimed to assess the degree to which the participants utilized Information and Communication Technology (ICT) tools for agricultural and rural development purposes. In this research, the dependent variable was the extent of ICT tool usage. This was measured through a structured schedule developed by the researcher, incorporating feedback from subject matter

experts. The extent of ICT utilization was evaluated based on four key aspects: the availability of ICT tools to the farmers, the pattern of ICT use in agricultural and related activities, the use of ICT tools in various stages of crop cultivation, and the frequency and extent of usage of agricultural mobile applications by the farmers.

Results and Discussion

To determine the relationship between various socio-personal factors and the extent of ICT tool usage, the Karl Pearson correlation coefficient test was employed. The results, which examine the correlation between selected socio-economic and personal attributes—including age, education, annual income, social involvement, family size, landholding size, exposure to mass media, occupation, and access to mechanical power—and the dependent variable (extent of ICT tool utilization), are presented in the table.

Table 1: Relationship between selected independent variables and extent of utilization of ICT tools

S. No.	Independent variable	Correlation coefficient(r)		
		Adjacent farmers (n ₁ =60)	Distant farmers (n ₂ =60)	Total (n=120)
1	Age	-0.171NS	-0.175NS	-0.175NS
2	Education	0.411**	0.424**	0.420**
3	Annual income	0.320*	0.318*	0.321**
4	Social participation	0.324*	0.434**	0.381**
5	Family size	-0.130NS	-0.025NS	-0.018NS
6	Size of land holding	0.408**	0.455**	0.435**
7	Mass media exposure	0.424**	0.402**	0.412**
8	Occupation	0.332**	0.367**	0.343**
9	Mechanical power	0.338**	0.364**	0.351**

* Significant at 5% level of significance

** Significant at 1% level of significance

NS - Non - significant

The data presented in the table indicated that age had a negative and statistically insignificant relationship with the extent of ICT tool utilization among both adjacent and distant farmers. As a result, the null hypothesis (H01.1), stating that "there is no relationship between the extent of ICT tool utilization by adjacent and distant farmers and their age," was accepted. This suggests that age did not have an impact on ICT tool usage for either group of farmers. These findings are consistent with those reported by Sing and Kameswari (2019) [5].

Additionally, the data revealed a strong positive and statistically significant relationship between education and the use of ICT tools among both adjacent and distant farmers, with significance at the 1% level. This suggests a positive association between educational level and ICT tool utilization. Furthermore, a significant positive relationship was found between social participation and the use of ICT tools, with significance at the 5% level for both adjacent and distant farmers. Specifically, a positive and significant relationship was observed between social participation and ICT tool usage for adjacent farmers at the 5% level, while for distant farmers, the relationship was significant at the 1% level.

The analysis also showed a positive and highly significant relationship (at the 1% level) between mechanical power and ICT tool utilization, leading to the rejection of the null hypothesis (H01.9) and the acceptance of the alternative hypothesis. This conclusion indicates a strong positive association between mechanical power and the extent of

ICT tool usage, which was significant for both adjacent and distant farmers.

Conclusion

The study revealed that factors such as education, annual income, social participation, landholding size, mass media exposure, occupation, and mechanical power were all positively and significantly correlated with the extent of ICT tool utilization at the 1% level of significance. In contrast, age and family size showed a negative and statistically insignificant relationship with the utilization of ICT tools. Among both adjacent and distant farmers, education, landholding size, mass media exposure, occupation, and mechanical power were positively and significantly correlated at the 1% level. The annual income of both groups of farmers demonstrated a positive and significant correlation at the 5% level. Social participation was positively and significantly correlated with ICT tool usage at the 1% level for distant farmers, while for adjacent farmers, it showed a positive and significant correlation at the 5% level. On the other hand, the age and family size of both adjacent and distant farmers were negatively and non-significantly related to their extent of ICT utilization.

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