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Analysis of constraints faced by respondents as online communication users

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Abstract

Information and Communication Technologies (ICTs) play a crucial role in strengthening agricultural extension services by facilitating timely and effective transfer of technology (ToT) from research institutions to farming communities. Despite rapid advancements in digital technologies, several constraints hinder the effective use of online communication tools among farmers, particularly in rural areas. The present study was conducted in Eastern Uttar Pradesh to analyze the constraints faced by farmers as online communication users and to document their suggestions for improving digital extension services. A descriptive research design was employed with a sample of 400 farmers selected through a multistage sampling technique. The findings revealed that unavailability of accurate and appropriate information, lack of education, and non-user-friendly ICT tools were the most serious constraints. Farmers suggested skill training, provision of information in regional languages, and encouragement to use ICT tools at the village level as key measures to overcome these constraints. The study highlights the need for user-centric, localized, and capacity-building approaches to enhance the effectiveness of ICT-enabled agricultural extension.

Keywords: ICT, online communication, constraints, agricultural extension, farmers, digital divide

Introduction

Agricultural extension is an educational service that disseminates information and new technologies to farming communities with the objective of improving agricultural productivity, income, and standard of living. Extension personnel play a critical role in transferring innovations from research institutions to farmers. However, conventional extension systems often face limitations due to physical distance, inadequate transportation, and limited manpower. Information and Communication Technologies (ICTs) offer immense potential to strengthen the transfer of technology (ToT) between research, extension systems, and end-users. ICT tools such as mobile phones, internet platforms, and digital advisory services can enhance outreach, reduce information gaps, and improve service delivery efficiency.

Meera *et al.* (2004) ^[3] emphasized that ICTs can empower farmers by providing greater control over information access and decision-making. ICTs also help transform extension personnel into “knowledge workers,” promoting bottom-up, demand-driven technology generation and dissemination. Despite these advantages, ICT adoption in agriculture remains uneven due to disparities in infrastructure, digital literacy, affordability, and content relevance.

Common constraints in ICT adoption include illiteracy, lack of localized content in regional languages, poor internet connectivity, high costs of devices and services, limited awareness, and inadequate technical support. Additionally, human mediation at the last mile remains essential,

indicating continued dependency on extension agents. Given the limited empirical studies on constraints faced by farmers in using online communication tools, particularly in Eastern Uttar Pradesh, the present study was undertaken to analyze these constraints and document farmers’ suggestions for improving ICT-based extension services.

Information is critical in agricultural development because it is a tool for communication between stakeholders and serves as a channel for assessing trends and shaping decisions (Kalusopa, 2005) ^[2]. Farming requires information and technical expertise hence the need for extension services however, due to various factors extension services are not readily available to all farmers. A consensus exists that extension services, if functioning effectively, improve agricultural productivity by providing farmers with information that helps them to optimize their use of limited resources (Muyanga and Jayne, 2006) ^[4].

The goals of agricultural extension includes transferring information from the global knowledge base and from local research to farmers, enabling them to clarify their own goals and possibilities, educating them on how to make better decisions, and stimulating desirable agricultural development (Van den Ban and Hawkins, 1996) ^[7]. Investments in extension services have the potential to improve agricultural productivity and increase farmers’ incomes, especially in developing economies, where more than 90.00 per cent of the world’s nearly 1 million extension personnel are located. Yet the impact of extension on farm performance is varied, reflecting differences in how extension services are delivered and in the circumstances of

service recipients (NSSO, 2005) [5].

The emerging challenges and opportunities call for a paradigm shift in the innovation driven agricultural research system to connect inventions with all the stakeholders in the entire food supply chain. Social media and internet are embracing almost all the sectors of life. In agriculture there is a need to reach each and every farmer and provide them the updated information. Communities of social media are open networks where everyone (i.e clients, users, members) has an opportunity to contribute their ideas and to support mass innovation with one-to-one, one-to-many, and many-to-many interactions. clients, users, members) has an opportunity to contribute their ideas and to support mass innovation with one-to-one, one-to-many, and many-to-many interactions (Ashley *et al.*, 2009) [1]. The study reveals that the primary financial constraint faced by the farmers was the high cost of cattle feed, while the key personal constraint was identified as the lack of adequate infrastructure facilities. The farmers were also found to be faced with the situational constraints of the incidence of diseases among cattle, and the major marketing challenge identified was low milk prices. (Sharanya and Anumol.,2026) [6].

Research Methodology

The study was conducted in Eastern Uttar Pradesh, a region characterized by predominance of small and marginal farmers (average holding size <2 ha), rice-wheat cropping systems, alluvial soils, monsoon-dependent irrigation and varying digital penetration due to uneven infrastructure and socio-economic factors. This area faces challenges like limited traditional extension reach and emerging digital adoption.

A descriptive research design was adopted, as it is most suitable for describing existing conditions, relationships and

patterns of behaviour among farmers regarding the use of digital extension services. A multistage purposive-cum-random sampling technique was employed to select the sample. In the first stage, two districts—Chandauli and Mirzapur—were purposively selected. The selection was based on the following criteria: (i) representation of typical agro-climatic conditions of Eastern Uttar Pradesh, (ii) presence of both progressive and less progressive blocks in terms of ICT adoption, (iii) reasonable variation in access to mobile internet and smartphone usage among farming communities and (iv) logistical feasibility for field data collection.

In the second stage, from each selected district, two blocks were chosen randomly using a lottery method. In the third stage, five villages were randomly selected from each chosen block using the random sampling technique. Thus, a total of 4 blocks (2 from each district) and 20 villages (5 from each block) formed the sampling frame.

In the final stage, from each selected village, 20 farmers were selected using systematic random sampling. The sampling interval was determined by dividing the total number of operational farmers in the village (as per the latest revenue/village records) by 20. Starting from a randomly selected number, every farmer was included in the sample. This procedure yielded a total sample size of 400 farmers (20 villages × 20 farmers).

Measurement of Constraints and Suggestions

Respondents were asked to indicate constraints faced and suggestions for improvement. Frequencies and percentages were calculated, and ranks were assigned based on descending order of percentages.

Results and Discussion

Constraints Faced by Online Communication Users

S. No.	Constraints	Frequency	Percentage (%)	Rank
1	Unavailability of accurate and appropriate information	206	51.50	I
2	Lack of education	203	50.75	II
3	Non-user-friendly ICT tools	197	49.25	III
4	Poor condition of equipment	187	46.75	IV
5	Inadequate availability of ICT services to rural farmers	186	46.50	V
6	High cost of internet and devices	185	46.25	VI
7	Poor internet connectivity	183	45.75	VII
8	Lack of active participation of farmers	179	44.75	VIII
9	Delayed information delivery	177	44.25	IX
10	Lack of two-way interaction	175	43.75	X
11	Lack of trust in online information	172	43.00	XI
12	Lack of regional language content	169	42.25	XII
13	Lack of training and technical support	166	41.50	XIII
14	Problems of small landholding	163	40.75	XIV
15	Lack of social security	160	40.00	XV
16	Health problems in using ICT tools	148	37.00	XVI

The most severe constraint perceived by respondents was the unavailability of accurate and appropriate information, indicating concerns over reliability and relevance of online content. Lack of education and non-user-friendly ICT tools further limited effective utilization. Infrastructure-related issues such as poor equipment condition, limited ICT services, and high costs also significantly affected adoption.

These findings align with earlier studies highlighting digital divide and content relevance as major barriers to ICT adoption in agriculture.

Suggestions for Improving Online Communication Services

S. No.	Suggestive Measures	Frequency	Percentage (%)	Rank
1	Skill training should be given to farmers	310	77.50	I
2	Information should be in regional language	305	76.25	II
3	Encourage use of ICT tools at village level	295	73.75	III
4	Provide timely and accurate information	285	71.25	IV
5	Government should build trust through campaigns	280	70.00	V
6	Provide feedback mechanisms	275	68.75	VI
7	Provide technical staff at village level	270	67.50	VII
8	ICT tools should be user-friendly	265	66.25	VIII
9	Improve power supply	210	52.50	IX
10	Ensure provision of accurate information	207	51.75	X
11	Improve farmers' education	203	50.75	XI
12	Improve internet connectivity	200	50.00	XII
13	Train farmers to use ICT tools effectively	197	49.25	XIII

Skill training emerged as the most important suggestion, emphasizing the need for capacity building. Localization of content in regional languages and village-level promotion of ICT tools were also prioritized. Farmers stressed the importance of trust, timely information, feedback systems, and technical support, underscoring the need for participatory and farmer-centric digital extension strategies.

Conclusion

The study reveals that while ICTs have significant potential to enhance agricultural extension services, farmers face multiple constraints in using online communication tools effectively. The most critical issues include lack of accurate and relevant information, low educational levels, non-user-friendly technologies, and infrastructural limitations. Farmers strongly emphasized capacity building, localization of content, trust-building initiatives, and village-level technical support as key measures for improvement.

To enhance the effectiveness of ICT-based extension services, policymakers and extension agencies should focus on:

- Developing reliable, localized, and farmer-oriented digital content
- Strengthening digital literacy and skill training programs
- Improving rural ICT infrastructure and affordability
- Ensuring two-way communication and feedback mechanisms

Addressing these issues will contribute to inclusive digital agriculture and improved livelihoods for small and marginal farmers.

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