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Adoption Behaviour of Farmers Using Social Media for Agricultural Information in Bhagalpur District of Bihar

Sree Pavan Nageswar Chadalawada[1], Anil Paswan[2], Deepak Kumar Patel[*1], Birendra Kumar[3], Awdhesh Kumar[4], Vinayak V Deshi[5] and Anil Kumar Singh[6]

ABSTRACT

The present study was conducted during 2024-25 in Bhagalpur district of Bihar to examine adoption behaviour of farmers using social media for agricultural information. A total of 120 farmers were selected from six villages of Gopalpur and Nathnagar blocks through purposive and then followed by random sampling. An ex-post facto research design was adopted. Adoption was measured through a validated 20-item scale (Cronbach alpha = 0.865) and computed by Adoption Quotient. Data were analysed using frequency, percentage, mean, standard deviation and Pearson's correlation coefficient. Results showed that most respondents (52.50%) had medium adoption, with mean AQ of 48.88. Social media was mainly adopted for government scheme information, pest and disease management and fertilizer management. Social participation, annual family income and extension participation were positively related to adoption, whereas age was negatively related. The study suggests verified, local-language and group-based digital extension support for farmers.

Keywords: Adoption behaviour, Social media, Digital extension, ICT, Adoption quotient

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INTRODUCTION

Information and communication technology (ICT) has transformed the delivery of agricultural extension services by improving the speed, reach and timeliness of farm advisories. In India, where the extension worker-to-farmer ratio is far below the recommended level, digital platforms provide an important complementary mechanism to bridge the information gap (Mukherjee and Maity, 2015; Committee on Doubling Farmers Income, 2017). Social media has moved beyond entertainment and personal communication to become a useful channel for agricultural knowledge sharing, advisory dissemination and farmer-to-farmer learning (Kumar et al., 2020; Mahajan et al., 2021).

The global penetration of social media has reached a very high level. World Population Review (2025) reported that nearly 5.17 billion users, representing almost two-thirds of the world population, were connected through social platforms in early 2025. In India, the rapid expansion of internet and social media use has strengthened the scope of digital agricultural extension (Kantar and IAMAI, 2024; Raghav et al., 2023). Among farmers, WhatsApp, YouTube and Facebook have been frequently used for agricultural information sharing through farmer groups, crop advisory video channels and institutional pages operated by government and research organizations (Mishra et al., 2022; Yadav and Agarwal, 2018). Social media can support farmers by providing timely information on weather, market prices, crop management, pest and disease management, fertilizer use, government schemes and value addition (Bhatt and Bhatt, 2019; Sharma and Sharma, 2021). However, adoption of social media for agriculture is not uniform across farming communities; it is influenced by age, education, income, social participation, extension participation, media exposure and other socio-economic conditions (Shivakumara et al., 2018; Singh et al., 2021). The diffusion of innovations perspective also emphasises that adoption is shaped by both individual characteristics and the social system within which farmers operate (Rogers, 2003; Feder et al., 1985).

Bihar provides an important setting for studying digital extension because a large share of its population depends on agriculture and mobile internet use is expanding (Bihar Economic Survey, 2024; Kumar et al., 2020). Bhagalpur district, with its diverse farming systems including cereals, horticulture and sericulture, offers a relevant context for analysing how farmers use social media for agricultural

[1]Department of Agricultural Extension Education, Bihar Agricultural University, Sabour, Bhagalpur-813 210, Bihar, India
[2]Bihar Forestry College and Research Institute, Munger- 811202
[3]Department of Agronomy, Bihar Agricultural University, Sabour, Bhagalpur- 813 210
[4]Department of Agricultural Statistics Bihar Agricultural University, Sabour, Bhagalpur-813 210
[5]Department of Horticulture (Post-Harvest Management), Bihar Agricultural University, Sabour, Bhagalpur- 813 210
[6]Director Research, Bihar Agricultural University, Sabour, Bhagalpur- 813 210
[*]Corresponding Author E-mail: dkpbhu9915@gmail.com

information. In view of the documented role of ICT and social media in reducing information gaps, the present study was undertaken to examine the adoption behaviour of farmers using social media for agricultural information in Bhagalpur district of Bihar and to identify selected variables associated with their adoption level (Mahajan et al., 2021; Mishra et al., 2022).

MATERIALS AND METHODS

Research design and locale

An ex-post facto research design was adopted because the independent variables had already occurred in the study population and could not be manipulated experimentally, which is appropriate for behavioural studies in extension education (Rogers, 2003; Singh, 2012). The study was conducted in Bhagalpur district of Bihar during 2024-25. Two development blocks, namely Gopalpur and Nathnagar, were selected purposively on the basis of researchers' familiarity with local culture.

Sampling procedure

Purposive and random sampling was followed. Three villages were selected randomly from each of the two blocks, making a total of six villages. From each village, 20 respondents were selected through simple random sampling. Thus, the total sample size of the study was 120 farmers who were using at least one social media platform for agricultural information.

Variables

Sixteen independent variables were selected for the study, namely age, gender, caste, education, marital status, family type, family size, housing pattern, land holding, occupation, annual family income, material possession, extension participation, social participation, social media exposure and economic motivation. Adoption of social media for agricultural information was treated as the dependent variable.

Measurement of adoption

Adoption was measured with the help of a 20-item adoption scale developed for the study. The statements covered crop production, pest and disease management, fertilizer management, government schemes, market prices, weather information, value addition and other agricultural uses of social media. Each statement was scored on a three-point continuum: fully adopted = 2, partially adopted = 1 and not adopted = 0. The reliability of the scale was satisfactory with Cronbach alpha of 0.865. Overall adoption was computed by using the Adoption Quotient method of Chattopadhyay (1963).

Other measurement tools

Socio-personal variables were measured through standardised procedures wherever applicable. Trivedi and Pareek (1963) scales were used with suitable modifications for caste, family type, family size, housing pattern, occupation and material possession. Education and social participation were measured by the scale of Thakre and Ingle (2007), while economic motivation was measured through the scale of Supe (1969) with suitable modifications. Social media exposure was measured through a researcher-developed Likert-type scale.

Data were collected through a structured personal interview schedule. The collected data were coded, tabulated and analysed by using frequency, percentage, mean, standard deviation and Pearson's coefficient of correlation. Data processing was done with the help of SPSS Version 23 and Microsoft Excel.

RESULTS AND DISCUSSION

Socio-personal profile of respondents

The socio-personal profile of respondents is presented in Table 1. The majority of respondents (57.50%) belonged to the middle age group of 30-60 years, with a mean age of 44.96 years. Similar dominance of middle-aged farmers in ICT and social media-based agricultural information seeking has been reported by Mishra et al. (2022) and Singh et al. (2021). Male respondents constituted 71.67 per cent of the sample. High school level education was the dominant category (47.50%), indicating moderate educational readiness for the use of social media. The majority of respondents belonged to nuclear families (74.17%) and had medium family size. More than half of the respondents (51.00%) belonged to the low annual family income category, which reflects the smallholder and resource-constrained socio-economic background of Bihar agriculture (Bihar Economic Survey, 2024; Kumar et al., 2020). Medium level of social media exposure was observed among 61.67 per cent of the respondents. WhatsApp was the most regularly used platform, followed by YouTube, suggesting the importance of mobile-based and video-based information channels for agricultural communication, as also reported by Yadav and Agarwal (2018), Mishra et al. (2022) and Kantar and IAMAI (2024).

Table 1: Socio-personal profile of respondents

S. No.	Variable	Dominant category	Frequency	Percentage (%)
1	Age	Middle age (30-60 years)	69	57.50
2	Gender	Male	86	71.67
3	Education	High school level	57	47.50
4	Annual family income	Low (< Rs. 61,952)	61	51.00
5	Family type	Nuclear	89	74.17
6	Social media exposure	Medium level	74	61.67

n = 120

Adoption level of farmers using social media

The overall adoption level of respondents computed through the Adoption Quotient method is shown in Table 2. More than half of the respondents (52.50%) were in the medium adoption category. Low adoption was observed among 25.83 per cent of the respondents, while 21.67 per cent belonged to the high adoption category. The mean adoption quotient was 48.88 with a standard deviation of 20.93. These findings indicate that farmers have started integrating social media into agricultural information seeking, but the use has not yet become fully established across all agricultural activities. Similar medium-level adoption of ICT or social media for agricultural information has been observed in comparable farmer populations, where adoption is influenced by access, perceived usefulness and digital capability (Shivakumara *et al*., 2018; Singh *et al*., 2021; Rogers, 2003).

Table 2: Overall adoption level of respondents based on Adoption Quotient

Category	Score range (AQ %)	Frequency (n)	Percentage (%)
Low adoption	Below 27.8	31	25.83
Medium adoption	27.8 - 69.7	63	52.50
High adoption	Above 69.7	26	21.67
Total	-	120	100.00

n = 120; Mean AQ = 48.88; SD = 20.93.

Statement-wise adoption of social media Statement-wise analysis showed clear differences in adoption across agricultural domains (Table 3). Use of social media to access government scheme information ranked first with a mean score of 1.267 and 45.83 per cent full adoption. Adoption of pest and disease management practices learned from social media ranked second, followed by fertilizer management practices. Similar preference for operational and need-based information through social media has been reported in studies on agricultural advisory dissemination and farmer information behaviour (Bhatt and Bhatt, 2019; Sharma and Sharma, 2021; Mahajan *et al*., 2021). In contrast, use of social media to learn about export quality standards ranked lowest. This pattern indicates that farmers preferred information having immediate practical or economic utility, such as schemes, pest management and nutrient management, while advanced market-linked information was adopted to a lesser extent, which is consistent with the economic benefit perspective of adoption (Feder *et al*., 1985).

Table 3: Statement-wise adoption levels - top and bottom ranked items

Rank	Adoption statement	Mean score	Adoption (%)
I	Use of social media to access government scheme information	1.267	45.83
II	Adoption of pest and disease management practices from social media	1.225	41.67
III	Adoption of fertilizer management practices learned from social media	1.200	40.83
XX	Use of social media to learn about export quality standards (lowest)	0.650	13.33

n = 120; Scale: Fully adopted = 2, Partially adopted = 1, Not adopted = 0.

Correlates of adoption behaviour

Pearson's correlation coefficients were computed to assess the relationship between selected independent variables and adoption level. The significant variables are presented in Table 4. Social participation had the strongest positive relationship with adoption (r = 0.758), indicating that farmers involved in social groups, cooperatives and community organizations were more likely to use social media for agricultural information. This confirms the importance of social systems, peer influence and group learning in the diffusion of innovations (Rogers, 2003; Feder *et al*., 1985; Yadav and Agarwal, 2018). Annual family income (r = 0.458) and extension participation (r = 0.419) also showed significant positive relationships with adoption. These findings suggest that economic capacity and contact with extension activities help farmers access and use digital information channels more effectively (Mukherjee and Maity, 2015; Kumar *et al*., 2020; Mahajan *et al*., 2021).

Age showed a significant negative relationship with adoption (r = -0.240), indicating that younger farmers were comparatively more inclined to use social media for agricultural purposes. This may be due to their greater familiarity with smartphones, digital applications and online content, which is supported by technology acceptance studies that identify age as an important factor in perceived ease of use and digital adoption (Davis, 1989; Venkatesh et al., 2003). Social media exposure was also found to be associated with adoption, showing that repeated exposure to platforms can strengthen adoption behaviour. Earlier agricultural studies also suggest that repeated ICT exposure improves confidence and use of digital tools for farm decision-making (Bhatt and Bhatt, 2019; Singh *et al*., 2021). Other variables, including gender, caste, family type, family size, land holding, housing pattern, occupation, material possession and economic motivation, did not show statistically significant relationships with adoption in the present analysis.

Table 4: Correlation of significant independent variables with adoption level

S. No.	Independent variable	r (Adoption)	Significance
1	Age	-0.240**	Significant (p<0.01)
2	Extension participation	0.419**	Significant (p<0.01)
3	Social participation	0.758**	Significant (p<0.01)
4	Social media exposure	0.0003**	Significant (p<0.01)
5	Annual family income	0.458**	Significant (p<0.01)

*** Significant at 0.01 level; * Significant at 0.05 level; n = 120. Values are reported as obtained in the present analysis.*

CONCLUSION

The study concluded that the majority of farmers in Bhagalpur district had medium-level adoption of social media for agricultural information, which reflects the transitional nature of digital extension adoption as explained in diffusion literature. Government scheme information, pest and disease management and fertilizer management were the most adopted agricultural uses of social media, supporting earlier observations that farmers prioritise need-based and benefit-oriented digital information. Social participation, annual family income, extension participation and social media exposure were found to be important positive correlates of adoption, whereas age showed a significant negative relationship.

The findings imply that digital extension strategies should be locally relevant, verified and group-oriented. Bihar Agricultural University, KVK Bhagalpur and the Bihar Department of Agriculture may strengthen farmer groups through verified WhatsApp advisories, short local language videos and regular demonstrations on safe and effective use of social media. Special efforts are required for older and low-income farmers so that the benefits of digital extension reach all sections of the farming community.

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