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Farmers' Use of Social Media and Constraints Faced: A Study in Uttarakhand, India

Aafreen Malik [a++] and M. A. Ansari [a#*]

[a] Department of Agriculture Communication, College of Agriculture, G.B. Pant University of Agriculture & Technology, Pantnagar-263145, Dist. U. S. Nagar (Uttarakhand), India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The emergence of social media has opened-up new avenues for information dissemination, social interactions and communication in various sectors, including agriculture. Farmers are also actively using social media for seeking and sharing information related to agriculture through various social media platforms. However, farmers often encounter several constraints in leveraging these technology platforms effectively. This research investigated the multifaceted challenges faced by farmers in utilizing social media for agricultural purposes. The present study was conducted in one district (U.S. Nagar) of Uttarakhand, known as food bowl of the state with the objective to find out farmers' usage pattern of social media and identify constraints faced by the farmers in accessing and using the social media. The study followed an exploratory research and the study sample

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[++]Ph. D. scholar;
[#]Professor;
**Corresponding author: E-mail: aslam1405@gmail.com;*

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comprised of purposively selected 200 farmers (those who owned a smartphone) spread over eight villages. The data was collected using a pre-tested structured interview schedule. The study findings revealed that the primary constraints faced by respondents in using social media were lack of awareness about useful websites and mobile apps, poor digital literacy, and poor competency in its use. Further, it also revealed that while younger, more educated farmers tend to use social media more readily, older and rural farmers face substantial hurdles. The study underscores the need for targeted interventions, including digital literacy programs, infrastructure improvements, and the creation of relevant, localized content to enhance social media's utility in agriculture. These insights will inform the policymakers, scientists, agricultural extension services, and technology developers in crafting relevant and appropriate strategies to bridge the digital divide and empower farmers through effective use of social media.

Keywords: Social media; mobile apps; social media in agriculture; farmers' use of social media; Uttarakhand.

1. INTRODUCTION

In the contemporary society, the power of social media needs no reiteration. Everyone cutting across the entire social spectrum, and yes, including the farmers, are grazing on the digital landscape and spending lots of time and efforts to seek and share information in multiple ways. Thanks to the gradual and regulated expansion of ICT infrastructure across the country in 2000s, the speed and scope for creating such a digitally inclusive society with multifarious services architecture in virtual forms, has increased manifold.

Of late, mobile has become the media of choice of the masses, be it in rural or urban areas. Mobile based internet has consequently become a favourite and powerful media of communication, social interaction or information dissemination [1]. We never before had such a powerful tool to connect with millions of people instantly and simultaneously from the comfort of our home as well as workplace. The statistics reveal that total number of Internet subscribers in India are 936.16 million at the end of January 2024, registering a quarterly growth rate of 1.96 per cent. Out of them 38.57 million wired internet subscribers while wireless internet subscribers are 897.59 million.

The integration of social media into various sectors has transformed communication and information dissemination, offering unprecedented opportunities for knowledge exchange and community engagement. In agriculture, social media holds significant potential to bridge the information gap, providing farmers with real-time updates on weather conditions, market prices, farming techniques, and pest control methods [2]. However, despite these advantages, farmers across the globe face substantial barriers in effectively utilizing these social media platforms for agricultural purposes.

In India, studies have highlighted that the adoption of social media among farmers is hindered by factors such as low digital literacy, inadequate internet connectivity, and a lack of content in local languages [3]. These challenges are compounded by socioeconomic factors, including education levels, age, and geographic isolation [4]. Similarly, research in Kenya has shown that while social media can significantly enhance agricultural productivity and market access, farmers often struggle with the technical complexities of these platforms and require training to use them effectively [5].

The situation is comparable in other developing regions. For instance, in Nigeria, the main constraints include poor internet infrastructure and high costs of mobile data, which limit farmers' ability to access and utilize social media [6]. In contrast, developed countries face different sets of challenges. In the United States for example, although internet access is generally more widespread, older farmers exhibit reluctance towards adopting new technologies, preferring traditional methods of communication and information gathering [7]. Similarly, in Australia, farmers express concerns over the privacy and security of sharing agricultural data online, which affects their willingness to use social media platforms [8]. Moreover, cultural factors also play a significant role. For example, in China, social media usage among farmers is influenced by the collective approach to farming and the reliance on community leaders for information dissemination rather than individual use of digital platforms [9]. This cultural reliance on traditional information sources can slowdown the adoption of new technologies.

Social media has now become a mainstream form of communication around the world, and continues to grow in popularity with the increase in the number of smart phones, and the ease of use. Social media has given the power to the voice even of the average and common men. A high (99.00 per cent) number of agricultural extension professionals are also using social media platforms [10]. It can be utilised in the production, processing, promotion, and distribution of farm products to sustain the agriculture business. 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 has an opportunity to contribute their ideas. Despite such progress, farmers are also facing difficulties in social media utilisation. This study focuses on the constraints faced by farmers in social media has been identified.

Against the backdrop of the foregoing discussion and importance of social media in contemporary society, the present study was undertaken with the objective to find out farmers' use of social media and identifying & analysing the constraints faced by the farmers in using social media for agriculture purpose in a North Himalayan state of Uttarakhand in India

2. METHODOLOGY

The study was carried out in the Udham Singh Nagar district of Uttarakhand State of India. The district was selected purposively as it is known as food bowl of the state having large presence of farmers and has high agriculture productivity. The study sample comprised of 200 farmers selected purposively (criteria being the ownership of a smart phone and using social media) and spread over eight villages (Malpuri, Bijti, Gulabhoj, Girdhar Nagar, Mundia, Bahadurganj, Saijani and Shahdaura). Using Snowball sampling techniques, 25 farmers from each village were purposively selected based on the criteria that they owned a smart mobile phone. The data was collected using pre-tested structured interview schedule. The data, thus collected, was subjected to descriptive and inferential statistical analyses.

3. RESULT AND DISCUSSION

3.1 Profile Characteristics of Farmers

Demographic characteristics play a significant role in the access and use of social media by the people. Hence, understanding these characteristics can help in designing relevant and appropriate social media interventions for catering to the specific needs and preferences of different farmers groups thereby enhancing their engagement and effectiveness of social media use. Table-1 presents the results obtained in respect of farmers' profile characteristics.

The results presented in Table-1 reveals farmers' profile characteristics. The majority of farmers surveyed were middle-aged (52.50%), predominantly male (96.50%), and well-educated (36.50% holding graduate degrees and 32% being educated up to senior secondary level). Further, most farmers rely solely on agriculture for their livelihood (96.00%) and live in joint families (75.00%). A significant portion (58.00%) are marginal farmers with less than 1 ha of land, and 67.50% reported to have a low annual income. The majority of farmers have a medium level of scientific orientation (53.00%) and achievement motivation (90.00%). In terms of ICT orientation, 44.50% have a medium level, indicating moderate engagement with information and communication technologies.

Pandey and Mazhar [11] in a study on knowledge and attitude regarding social media as a source of information reported that majority of farmer (42.5) were middle aged and 65.8 percent had good knowledge of social media. Jain et al. [12] reiterated that majority of farmers using social media were middle-aged. Concerning their educational status, more than half of the respondents (61.70%) had collegiate education followed by an equal percentage of (17.50 %) respondents who had primary and secondary education and only (3.30%) of respondents had middle school education. Additionally, Harsini et al [13] while studying social media utilisation by farmers of Coimbatore district in Tamil Nadu observed that majority of the farmers were young, male, educated up to higher school level, practised farming as the major occupation with high level of digital literacy. Meena et al [14] in a study on social media used by farmers in sharing farm information reported that majority (63 percent) reported moderate medium achievement motivation.

3.2 Farmers' Awareness of Social Media

The awareness of social media significantly impacts their usage behaviour in several ways. Higher awareness levels lead to increased use of various social media platforms besides affecting

their access to information, networking and community engagement. Farmers aware of social media can use it as a platform to voice their concerns, advocate for policies, and gain support from wider audiences. Overall, greater awareness of social media empowers farmers to utilize these platforms effectively, enhancing their farming practices, market reach, and community engagement. The results obtained are presented in Table-2.

Table 1. Demographic profile of the farmers (n=200)

S. No	Profile Attributes	Categories	Frequency	Percentage
1	Age	Young age (up to 35)	43	21.50
		Middle age (35 to 55)	105	52.50
		Old age (above 55)	52	26.00
2	Gender	Male	193	96.50
		Female	7	3.50
3	Education	Illiterate	0	0.00
		Primary	4	2.00
		Middle	18	9.00
		Matriculation	23	11.50
		Higher Secondary	64	32.00
		Graduate	73	36.50
		Post Graduate	18	9.00
4	Occupation	Farming	192	96.00
		Job + Farming	8	4.00
5	Family type	Nuclear	41	20.50
		Joint	159	79.50
6	Land holding	Marginal (<1 Ha)	116	58.00
		Small (1-2 Ha)	56	28.00
		Medium (3-10 Ha)	23	11.50
		Large (above 10 Ha)	5	2.50
7	Total family income (Rs/Yr).	Low (Up to 56,000)	135	67.50
		Medium (5,60,000 to 1,48,090)	60	30.00
		High (>1,48,090)	5	2.50
8	Scientific orientation	Low (up to 22)	29	14.50
		Medium (22 to 23)	106	53.00
		High (Above 23)	65	32.50
9	Achievement motivation	Low (up to 12)	3	1.50
		Medium (12 to 21)	185	92.50
		High (Above 21)	12	6.00
10	ICT orientation	Low (up to 21)	27	13.50
		Medium (21 to 26)	89	44.50
		High (Above 26)	84	42.00

Table 2. Distribution of respondents according to farmers' awareness of social media

Sl. No.	Social Media	Fully aware		Partially aware		Not aware		WMS	Rank
		Freq.	%	Freq.	%	Freq.	%		
1	Face book	154	77.00	41	20.50	5	2.50	2.75	III
2	WhatsApp	196	98.00	4	2.00	0	0.00	2.98	I
3	You Tube	187	93.50	11	5.50	2	1.00	2.93	II
4	Agri portals	38	19.00	86	43.00	76	38.00	1.81	V
5	Twitter	97	48.50	75	37.50	28	14.00	2.35	IV

The results in Table-2 shows that almost all the respondent farmers were aware of WhatsApp (98.00%), which ranked 1st with the highest Weighted Mean Score (WMS) of 2.98 followed by YouTube, Facebook, and Twitter, which ranked 2nd, 3rd, and 4th with WMS of 2.93, 2.75, and 2.35, respectively. On the other hand, respondents were less aware of specific agricultural portals which was ranked 5th with WMS 1.81. These findings show that the majority of respondents were extremely familiar with mainstream social media platforms such as WhatsApp, YouTube, and Facebook, with WhatsApp being the most well-known social media.

The study findings indicate a high level of awareness among respondents for mainstream social media platforms, with the following key implications: WhatsApp: Almost universal awareness (98.00%) and the highest Weighted Mean Score (WMS) of 2.98; YouTube: Second highest awareness with a WMS of 2.93; Facebook: Third in awareness, with a WMS of 2.75; Twitter: Fourth, with a WMS of 2.35; and Specific Agricultural Portals: Significantly lower awareness, ranking 5th with a WMS of 1.81.

Kaur et al [15] in a study on use of social media by farmers in Uttarakhand found that hat WhatsApp was used by maximum number of farmers (97.39%) followed by Facebook (76.61%) and YouTube (67.51%) while Twitter was used by least number of farmers (6.48%).

Sakthivel et al [16] reported that the overall effectiveness of the farmer's use of WhatsApp groups was at medium level (74.17%) indicating that farmers were using the group for their agricultural activities, the easiness of understanding information on WhatsApp was found to be good. Harsini et al [13] found that WhatsApp was the most used social media tool (78%) for communication while Facebook and YouTube for entertainment purpose. Meena et al (2022) revealed that WhatsApp, YouTube, and Facebook were the most popular social media tools which are being used by farmers for sharing farm information.

Thus, by understanding the varying levels of awareness, use and effectiveness of social media, and leveraging the strengths of each social media platform, stakeholders can enhance the effectiveness of their extension & communication interventions and support appropriate strategies for farmers.

3.3 Constraints Faced by Farmer in Using Social Media

The constraints faced by farmers in using social media are significant as they impact the overall usage pattern, effectiveness of different social media platforms, and the benefits of social media adoption in the agricultural sector. The results obtained are given in Table-3.

The results in Table-3 indicate that “lack of awareness about useful Mobile Apps” was highest ranked constraints (first) indicating that farmers are not aware of the agriculture related websites and Apps which limits their access to better and useful information. This suggests largescale mass awareness interventions are required among the farming community for making best use of online resources. Further, poor competency in the use of mobile apps was mentioned as the second most important constraint indicating users' inadequate skills in utilizing mobile apps effectively. This highlights a gap in digital literacy that could be addressed through training programs. Third constraint was “lack of awareness about useful websites”.

Table 3 Distribution of respondents based on constraints faced in using social media

Sl. No.	Constraints	WMS	Rank
1.	Lack of awareness about useful Mobile Apps	1.88	I
2.	Poor competency in use of Mobile Apps	1.64	II
3.	Lack of awareness about useful websites	1.51	III
4.	Poor network services	1.31	IV
5.	Poor competency in internet use	1.29	V
6.	Slow speed of internet	1.11	VI
7.	Poor competency in use of social media	1.02	VII
8.	Lack of confidence in using social media	1.01	VIII
9.	Cost of internet recharge	1.00	IX

(WMS=Weighted Mean Score)

Similar to the top-ranked constraint, there is also a significant lack of awareness among the regarding farmers about useful and helpful websites related to agriculture. This underlines the importance of promoting relevant and appropriate digital resources that can enhance users' online engagement and experiences. Fourth constraint was “poor network services” which indicate that users face network connectivity issues. This is critical for enhancing user networking and engagement for online information exchange. This points to an urgent need for infrastructure improvements to provide more reliable network services.

Other constraints as reported by the respondents were: Poor Competency in Internet Use (WMS 1.29, Rank V), Slow Speed of Internet (WMS 1.11, Rank VI), Poor Competency in Use of Social Media (WMS 1.02, Rank VII), Lack of Confidence in Using Social Media (WMS 1.01, Rank VIII), Cost of Internet Recharge & Cost of Internet Recharge (WMS 1.00, Rank IX).

The implications that emerge from these results are: Undertake mass awareness programmes for popularizing useful websites and mobile apps, improves digital literacy through periodic training of farmers at grassroots level, improve network infrastructure for enhancing user engagement, overcome economic barriers through competitive pricing of the improved digital access across the entire social spectrum, undertake some confidence building measures for overcoming psycho-social barriers to the use of digital tools, creating targeted content development and dissemination, and finally formulate holistic digital strategic interventions and policies fostering greater digital inclusion.

Lwoga and Ngulube [17] reported that poor internet access in rural areas limits farmers' ability to use social media effectively whereas Chhachhar, Qureshi, Khushk and Ahmed [18] observed that many farmers lack the necessary digital literacy to effectively use social media platforms. Further, Aker and Mbiti [19] found that the high cost of smartphones and data plans can be prohibitive for small-scale farmers while Reardon, Barrett, Kelly, and Savadogo [20] highlighted the fact that content on social media platforms may not be available in local languages or be culturally not relevant; and this could be one of the major constraint in the use of social media by the farmers.

Further, the farmers were also asked to rank each constraint faced by them in the use of social media on the 3-point severity continuum, i.e. Most severe, Severe and Least severe. The results obtained are given in Table-4.

The results given in Table-4 indicate that farmers face various constraints in using social media, with differing levels of severity: (a) Poor Network Services: Considered severe by 29.00% and least severe by 70.00%; (b). Slow Internet Speed: Seen as severe by 11.00% and least severe by 89.00%; (c) Lack of Awareness about Useful Websites: Severe for 44.50% and least severe for 52.50%; (d). Lack of Awareness about Useful Mobile Apps: Severe for 46.00% and least severe for 33.00%; (e). Poor Competency in Internet Use: Severe for 26.50%

Table 4. Severity of Constraints reported by farmers in the use of social media

Sl. No.	Constraints	Most Severe		Severe		Least Severe	
		F	%	F	%	F	%
10.	Poor network services	2	1.00	58	29.00	140	70.00
11.	Slow speed of internet	0	0.00	22	11.00	178	89.00
12.	Lack of awareness about useful websites	6	3.00	89	44.50	105	52.50
13.	Lack of awareness about useful Mobile Apps	42	21.00	92	46.00	66	33.00
14.	Poor competency in internet use	3	1.50	53	26.50	144	72.00
15.	Poor competency in use of Mobile Apps	10	5.00	107	53.50	83	41.50
16.	Poor competency in use of social media	2	1.00	0	0.00	198	99.00
17.	Cost of internet recharge	0	0.00	0	0.00	200	100.00
18.	Lack of confidence in using social media	1	0.50	1	0.50	198	99.00

and least severe for 72.00%, (f). Competency in Using Mobile Apps: Severe for 53.50% and least severe for 41.50%; (g). Poor Competency in Using Social Media: Least severe for 99.00%; (h). Cost of Internet Recharge: Unanimously considered least severe; and (i). Lack of Confidence in Using Social Media: Least severe for 99.00%.

These findings highlight the fact that major constraints reported by farmers while using social media are - lack of awareness about useful websites and mobile apps (for agriculture), and competency in using mobile apps. Besides, poor network services and slow internet speed are moderate issues, while the cost of internet and confidence in using social media are minimal concerns. Addressing these constraints can improve social media usage among farmers. Therefore, addressing educational, financial and competency issues could significantly enhance the effective use of ICT in agriculture. These findings are in agreement with the findings of [21, 22, 23, 24, 25, 26].

4. CONCLUSION & IMPLICATIONS FOR FUTURE

The study findings revealed that all the farmers (100%) were aware of social media; among various social media, WhatsApp was reported as the most common used social media followed by YouTube, Facebook and Twitter. Major constraints faced by the farmers in the use of social media were: lack of awareness about useful mobile apps (ranked first) followed by poor competency in use of mobile apps, lack of awareness about useful websites, poor network services, poor competency in internet use, lack of confidence in using social media and cost of internet recharge.

We may therefore conclude that key benefits of social media use by farmers include better access to information, improved market access, informed decision making, and social networking with farmers & other stakeholders. Further, constraints encountered by farmers in using social media include lack of knowledge about agriculture related websites & mobile apps, digital literacy and competency, network speed and cost of internet recharge. Therefore, formulating appropriate policies promoting mobile phone use and overcoming the constraints can bring about a transformation in social media use by farmers.

Researchers, extensionists as well as policy makers have always reiterated that technology adoption can be a significant driver of agriculture productivity, production efficiency and farm profitability. Timely access to information and awareness about latest agriculture technology can transform farmers' adoption behaviour and decision making. The emergence of Mobile telephony as a powerful tool for transforming agriculture sector and its incremental use by farmers in seeking and sharing information through the use of various social media platforms has the potential of transforming agriculture sector, and be a precursor to another green revolution in the country.

Some implications that emerge in view of the study findings are: The social media provides a robust foundation supporting the need for targeted interventions in raising awareness, improving digital literacy, enhancing network infrastructure, reducing economic barriers, building user confidence, and implementing holistic digital inclusion strategies.

Further, the social media can be used by the public and private extension systems that helps farmers to bridge the knowledge gap. Therefore, generating mass awareness about useful agriculture related websites and mobile apps, developing localized content covering major crops and agro-climatic regions, and engaging/ motivating Information Technology (IT) experts to create an innovative and imaginative mobile application support systems that enhances social media use among the farmers will greatly enhance social media use by the farmers and other stakeholders. By overcoming the identified constraints coupled with strategic interventions on improving digital skills & competency through sustained education and training programmes can be a significant driver of increased use of social media use by farmers.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

We hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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