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Role of Social Media in the Adaptation of New Agriculture Technology: A Study in Diffusion of Innovation Analysis

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Keywords: Social Media in Agriculture, Diffusion of Innovation, Technology Adoption, Agricultural Extension Services

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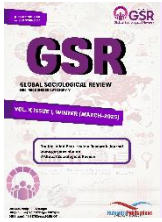

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Title

Role of Social Media in the Adaptation of New Agriculture Technology: A Study in Diffusion of Innovation Analysis

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Contents

Abstract

The research was set to find out the contribution of social media in the uptake of new agricultural technology. It defines the research design and quantitative-method approach. Also, the data collection instruments and the methods to ensure data validity and reliability were addressed. Based on the nature of the data collected, the research method also outlines the data analysis strategies to be employed, including statistical analysis, content analysis, or thematic analysis. The research emphasizes the methods through which social media sites can be utilized to disseminate knowledge, influence farmer attitudes, promote the uptake of advanced farming practices, and analyze data from various social media sites and farmer questionnaires through both qualitative and quantitative approaches. The research concludes that social media is a powerful tool for use in current agricultural extension services, offering an effective and scalable means of bringing innovations in sustainable agriculture to light.

Keywords: Social Media in Agriculture, Diffusion of Innovation, Technology Adoption, Agricultural Extension Services

Introduction

Social Media Challenges to Agricultural Technology Adoption examines and comprehends the different challenges and issues farmers and other stakeholders in agriculture experience in using social media platforms to adopt modern agricultural technologies. In several

industries, including agriculture, social media is becoming increasingly important in connecting individuals, sharing knowledge, and disseminating information (Jallow, 2017). Sustained developments in agricultural technology can potentially change the way farming is done and enhance production. Effective distribution and communication strategies are, however, necessary for new agricultural technologies to gain acceptance. In the recent past, social media sites have become effective platforms for the sharing of information and dissemination of knowledge (Bhargava, 2019). Exploring the role of social media in farmers' adoption of new agricultural technologies is the focus of this research. The agricultural industry is experiencing rapid technological developments, and new-age technologies can increase productivity and sustainability. The effective adoption and use of these innovations by farmers are critical to the development of the agriculture industry. Social media sites have emerged as influential tools for passing on information and sharing knowledge. To examine the impact of social media on farmers' adoption of new farm technology, this research proposal uses a diffusion of innovation approach (Mishra, 2019). The agricultural sector has grown remarkably in the past few years because of advancements in technology. Studies show traditional media, social media, and in-person meetings influence soybean producers in the U.S. and Brazil, two of the world's leading soybean producers (Colussi, Schnitkey, & Cabrini, 2024).

A significant sector that contributes to food security and the world's economy is agriculture. However, the sector has numerous challenges it has to tackle, including population growth, global warming, and more intense competition for resources (Zondo, 2023). Social media is a global platform full of multilingual information. It may be difficult for non-English-speaking farmers to find information relevant to them (Nordin, 2021; Gao, et al., 2024). Digital Agricultural Technology Services and Farmers' Willingness to Choose Digital Production Technology. This study investigates the function of digital agricultural technology services in enhancing farmers' adoption of digital production technologies and identifies significant influencing factors and channels. A farmer's willingness to embrace new technologies can be driven by factors such as age, and education, A farm's characteristics, such as size, location, and types of crops produced, can influence the speed of adoption of new technologies. The use of new technology can further be driven by institutional drivers, including government support services, regulations, and policies. There are farmers who have no access to the internet or social media.

Problems Statement

The social media's role in the diffusion of new agricultural technology poses a number of notable challenges and issues that must be resolved to facilitate effective diffusion and adoption among farmers. The problems are complex, entailing technological, socio-economic, and informational obstacles. Several farmers, particularly from rural settings, have limited exposure to the use of the Internet and digital media, which contributes to their incapacitation in harnessing social media to learn and adopt new technology in agriculture (Creswell, 2014).

Objectives of the Study

1. To analyze the impact of social media on farmers' knowledge and awareness of emerging agricultural technologies.
2. To examine the extent to which social media influences farmers' attitudes and perceptions towards adopting new agricultural innovations.
3. To examine the mechanisms by which social media enables the adoption and adaptation of new agricultural technologies by farmers.

Significance of Study

The importance of analyzing the role of social media in new agricultural technology adoption is due to its potential to redefine farming practices, increase production, and encourage sustainable farming. It is essential to know how social media influences the adoption and adaptation of agricultural innovations for several reasons.

Social media provides a good platform for sharing knowledge regarding new agriculture technologies.

An understanding of the way information spreads through social networks allows stakeholders to develop targeted strategies for conveying the benefits and best practices related to the deployment of these technologies.

Social media networks' convenience and coverage facilitate knowledge dissemination at speed, accelerating the process of adopting new-age technologies. Social media networks being used, actors are able to engage peers, experts, and vendors with whom they get to know about the latest technologies and hurdles to adoption, and consequently adopt them sooner.

Social media fosters collaborative learning and knowledge sharing among diverse agricultural stakeholders. Social media platforms allow farmers, researchers, policymakers, and industry representatives to exchange insights, resources, and experiences, thus facilitating ongoing learning and innovation.

Literature Review

The aim of this research is to examine how social media supports farmers in adopting and disseminating new agricultural technologies. The research examines how social media sites influence the adoption process of new agricultural technologies through the diffusion of innovation framework. This study aims to shed light on the ways in which social media usage influences the adoption of new agri-technologies by analyzing the relationship between social media usage and technology adoption (Xiong, 2022).

Kanjina's (2024) study attests to the fact that social media adoption for agriculture was extremely prevalent within the research locale, and it reports the crucial role that it played in agricultural development

(Mardiana, 2021). The transmission of innovation is one of the most important aspects of agribusiness farming. Many farmers failed to boost their earnings. Furthermore, they lost their income and even their land since they were unable to solve their problems, which the national development of the agriculture industry appeared impossible to overcome due to the necessity for more serious attention. Capareda (2020) noted that however, the communication and adoption processes may help to explain the necessity for innovation to spread. The crucial aspect of dissemination was the time dimension in chronology rather than history. Innovation was viewed as both a product of contradiction and the source of new contradiction, and the process of adoption was altered as both were structured. By identifying and evaluating the WHY and HOWs of the farmer-innovation system interface, a very good intervention ground would be created to make rational use of resources and knowledge for the development of agribusiness agricultural systems (Wang, 2020).

Studies highlight that social media platforms provide farmers with an abundance of information regarding new methods of farming and innovations, facilitating the sharing of knowledge and influencing technology adoption

(Anwarudin & Sumardjo, 2023).

While some conventional farmers use these technologies, they have become a lifeline for farmers who want to or are already farming more sustainably (Zekavica, 2018). These farmers are likely to be dispersed across the UK and may no longer share with their neighbors, instead relying on social media for advice and mentoring. Twitter broadcasts live coverage of key annual farming events. Farmers and other participants are urged to share highlights from the conference sessions, as well as comments on the speakers and the event itself so that those who are unable to attend can learn about it. Laksono et al. (2024) studied business performance was determined by social media adoption in this study, and millennial farmers' business turnover increased by 25% after the application of social media.

According to Li (2023), social embeddedness is always vital in supporting the proliferation of agricultural technology. However, in China, the social embeddedness of rural households has changed dramatically as the country moves from an 'acquaintance society' to a semi-acquaintance society'. Could this be the source of the disagreement about the role of social embeddedness? What are the disparities in the role of social embeddedness among farmers of varying land sizes? Using survey data from 583 rural families in Zhejiang Province, China, we constructed

an endogenous switching regression model to answer these issues. The findings revealed considerable disparities in social embeddedness between large and small-scale households. Although social embeddedness has a substantial impact on technological adoption, its function varies significantly between small and large-scale farmers.

Theoretical Framework

Social media reduces adoption barriers of technology by bridging information gaps, and myths, and offering advice to farmers. Standard adoption barriers to new technologies like the absence of information, risk perception, and uncertainty of gains can be eradicated by personalized social media promotional strategies (Capareda, 2020). Zhao & Wang (2024) researched that, it is noted that both media channels and social interaction matter when farmers adopt straw return systems, both channels complementing each other.

Collaborative learning and sharing of knowledge are essential elements of the adoption process. Social media platforms provide a platform for collaboration among different stakeholders like farmers, researchers, policymakers, and industry stakeholders. Online communities, discussion forums, and collaborative platforms allow stakeholders to share ideas, resources, and experiences, which results in continuous learning and innovation. By collaborative use of social media, the agricultural community can solve problems, co-design solutions, and bring about positive change (Puskur, 2012).

Research Questions

1. What is the influence of social media on farmers' awareness and knowledge of new agricultural technologies?
2. What social media impacts farmers' attitudes and perceptions towards adopting new agricultural innovations?
3. What are the mechanisms through which social media facilitates the adoption and adaptation of new agricultural technologies among farmers?
4. What is the role of social media in fostering collaborative learning and knowledge exchange among agricultural stakeholders?

Hypothesis

Hypothesis 1: Social media usage greatly enhances the exposure of farmers to new agricultural technologies, with a subsequent rise in technology adoption rates.

Hypothesis 2: Social media use to facilitate peer-to-peer communication between farmers improves the sharing of useful knowledge and experience, hence enabling the adoption of new agricultural technologies.

Hypothesis 3: The availability of educational information on agricultural technologies on social media sites enhances farmers' knowledge and competence, leading to greater technology uptake.

Hypothesis 4: Social media promotions by agricultural bodies and technology developers are more effective for marketing new agricultural technologies than using traditional media avenues.

Hypothesis 5: Mechanisms of interaction and feedback offered by social media platforms allow technology developers to adapt agricultural technologies through user feedback, thus accelerating their rate of adoption.

Research Methodology

New agricultural technology adoption is important to increase productivity, sustainability, and resilience in the agricultural sector. Social media platforms have grown to be highly influential in passing information and informing decision-making processes among farmers and agriculture stakeholders Creswell, (2014). The current research focuses on exploring the role of social media in the adoption of new agricultural technology based on the Diffusion of Innovation theory. Social media impacts technology adoption, this study aims to offer insights into successful strategies for marketing innovation in agriculture.

The research design section outlined the methodology employed in the study. It specifies the research approach, the quantitative-method approach. The population of interest and sampling techniques

were described, along with details of data collection methods such as surveys. Additionally, the instrumentation used for data collection and the procedures for ensuring data validity and reliability were discussed Yin (2018). This section also outlines the data analysis techniques to be employed, whether statistical analysis, content analysis, or thematic analysis, depending on the nature of the data collected.

Sample & Sampling Technique

A sample of 300 farmers and agricultural stakeholders were recruited for this study. The participants were recruited from different geographical locations and farming sectors to ensure the representation of a wide variety of views. Also, posts from social media sites relevant to the study were analyzed as qualitative data to complement the data. Farmers, agricultural extension personnel, researchers, and industry actors involved in agricultural technology adoption formed the sampling frame Bryman (2016). Farmers and stakeholders were stratified according to geographical location, farm size, and agricultural activity carried out. Random samples were taken from every stratum so that representation was achieved across various groups and agricultural domains.

Instrumentation

Likert-type attitude scale questionnaire was constructed and used as an instrument for data collection.

Validity and Reliability of Instrument

The sample was chosen in a way to be diverse and representative, thus increasing the validity of the findings of the study. Efforts are also made to reduce selection bias and make sure that participants well represent the target population. The reliability of the study was increased by using standardized sampling and data collection procedures, as well as by making sure that there is consistency in data analysis methods. Triangulation of data from more than one source and method further increases the validity and reliability of the findings (Babbie, 2020).

Data Collection

Information was gathered with the assistance of a questionnaire. Develop social media polls or quizzes and send them to farmers and stakeholders through social media networks to connect with farmers and stakeholders. Collect rapid feedback from these tools concerning certain elements of social media use and tech adoption. Take advantage of social media analytic platforms to measure engagement indicators, audience details, and agricultural tech topic-related trends. Analyze data from platforms like Twitter, Facebook, and agricultural-specific forums to gain insights into online behavior and sentiment. Distribute paper or digital surveys at agricultural events, conferences, and workshops where farmers and industry professionals gather. Capture insights from a broader audience about their experiences with social media and technology adoption.

Data Analysis

Quantitative data from surveys was analyzed using descriptive and inferential statistical techniques to identify patterns and relationships between social media usage and technology adoption. The data analysis discussed how collected data was analyzed using appropriate statistical methods to test hypotheses and identify patterns or relationships between social media usage and technology adoption. Data analysis SPSS was used. Percentage and mean scores were calculated. Data was analyzed with the help of percentage frequency and mean score of data. For analysis of data following scores were given to the responses used in the Likert scale.

Procedure

Farmers and stakeholders were recruited through various channels, including agricultural associations, social media platforms, agricultural events, and extension networks. Stratified random sampling was employed in choosing participants based on various geographical locations and agricultural industries (Robson & McCartan, 2016). They were approached and asked to join the study with an explanation of the intent and processes. They are required to fill up the online survey or attend the interviews or focus groups according to their own wish and time. Participants who were recruited using snowball sampling were

requested to refer to other eligible persons who might be willing to participate in the study.

Data Analysis

Social media plays an important role in the adoption of new agricultural technology because it provides a quick and efficient channel for information distribution, peer engagement, and knowledge sharing. Using the Diffusion of Innovation (DOI) hypothesis, research has demonstrated that platforms such as Facebook, Twitter, and YouTube dramatically increase the exposure and comprehension of breakthrough agricultural technology. They allow early adopters to share their experiences and outcomes, influencing the decision-making process of other farmers. The participatory element of social media enables real-time feedback, issue resolution, and technology customization for local circumstances, quickening the adoption curve. Furthermore, it connects researchers, extension agencies, and farmers, fostering trust and lowering the perceived risks of adopting new technology.

Data analyses were conducted based on percentage and mean ratings. These two parameters were observed with the aid of tables and statistical analysis when analyzing data.

Table 1

Age Wise Analysis

Age	Frequency	Percent
25-30	59	19.7
30-34	97	32.3
34-39	53	17.7
39-44	39	13.0
44-50	52	17.3
Total	300	100.0

The table shows that the 59 (19.7%) respondents were aged 25-30, the 97(32.3%) respondents were aged 30-34 years, the 53(17.7%) respondents were aged 34-39, the 39(13.0%) respondents were aged 39-44, the 52(17.3%) respondents were aged 50 years and over.

Table 2

Experience-wise ANOVA Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-5 years	76	165.4605	18.56121	2.12912	161.2191	169.7019	109.00	190.00
6-10 years	132	171.8409	26.01110	2.26398	167.3622	176.3196	74.00	190.00
11-15 years	24	121.5833	27.90187	5.69545	109.8014	133.3653	104.00	182.00
and more	56	156.2500	18.10098	2.41885	151.4025	161.0975	116.00	174.00
missing	12	120.1667	.38925	.11237	119.9193	120.4140	120.00	121.00
Total	300	161.2267	27.49087	1.58719	158.1032	164.3501	74.00	190.00

Table 3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	75570.046	4	18892.511	37.057	.000
Within Groups	150398.541	295	509.826		
Total	225968.587	299			

Table 22 shows that the mean values for the experience of respondents of 0-5, 6-10, 11-15, More, and missing are 165.46.05, 171.8409, 121.5833, 156.2500, 120.1667, and 161.2267 respectively on social media in the adaptation of new agri technology. The ANOVA also indicates that the p-value is less than 0.05 (i.e. .000) at df=4. So the difference between mean values is statistically significant. It means that the experience of the respondents other than the five categories has more positive social media in the adaptation of new agri technology. It shows that the respondents whose experience is 6-10 years have a more positive attitude towards classroom management than the respondents whose experience is 0-5, 11-15, More, and missing respectively. From the above table it also reflects that the respondent of missing experience has less social media in the adaptation of new agri technology.

Hypothesis 1: Social media platforms significantly increase the awareness of new agricultural technologies among farmers, leading to higher rates of technology adoption.

Table 4

Awareness of new agricultural technologies

	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
		%	%	%	%	%	
1.	Social media platforms provide timely information about new agricultural technologies.	7.3	1.3	5.3	42.0	44.0	4.14
2.	I frequently learn about new agricultural technologies through social media.	2.7	14.7	0	60.7	22.0	3.85
3.	Social media has increased my awareness of the latest developments in agricultural technology.	0	6.7	12.0	35.3	46.0	4.21
4.	Information on new agricultural technologies is more accessible on social media than through traditional media.	4.7	6.7	6.7	30.7	50.7	4.18
5.	Social media platforms are effective in spreading information about new agricultural technologies to a wide audience.	0	6.7	12.0	35.3	46.0	4.21

	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
6.	I rely on social media for updates on new agricultural technologies.	1.3	6.7	12.7	38.7	40.7	4.11
7.	Social media has played a crucial role in my decision to adopt new agricultural technologies.	0.7	6.7	8.0	38.0	46.7	4.23
8.	The information about new agricultural technologies on social media is reliable and trustworthy.	0	7.3	12.0	36.0	44.7	4.18

- Statement 1 shows that 86.0% of the respondents concurred that" Social media platforms are effective channels for disseminating information about new agricultural technology", 5.3% did not communicate their views and 8.6% respondents disagreed. The mean score was 4.14 which indicated that the announcement was acknowledged.
- Statement 2 indicates that 82.7% of the respondents concurred that" I frequently use social media to learn about new agricultural technologies", 0% did not communicate their view and 17.4% of respondents disagreed. The mean score was 3.85 and the level of agreement with the statement is high.
- Statement 3 shows that 81.3% of the respondents concurred that" Social media interactions with other farmers influence my decision to adopt new agricultural technology." while 12% did not communicate their view and 6.7% respondents disagreed. The average of responses is 4.21 which means that the level of disagreement is high.
- Statement 4 indicates that 81.3% of the respondents concurred that "I trust information about agricultural technology shared on social media" while 12% did not communicate their view and 6.7% of respondents couldn't help contradicting this announcement. The average of responses is 4.21 which means that the level of disagreement is high.
- Statement 5 demonstrates that 81.4% of the understudies concurred that " Social media helps me stay updated on the latest trends and innovations in agriculture", 6.7% of respondents were unsure while 11.4% of respondents couldn't help contradicting this announcement. The average of responses is 4.18 which means that the level of disagreement is high.
- Statement 6 shows that 81.3% of the respondents concurred that "I have adopted new agricultural technology based on recommendations or reviews seen on social media" while 12% were unsure and 6.7% of respondents couldn't help contradicting this announcement. The average of responses is 4.21 which means that the level of disagreement is high.
- Statement 7 shows that 79.4% of the respondents concurred that " Social media allows for easy communication with agricultural experts or extension agents regarding new technologies" while 12.7% of understudies were unsure and 8.0% of respondents couldn't help contradicting this announcement. The average of responses is 4.11 which means that the level of disagreement is high.
- Statement 8 shows that 84.7% of the respondents concurred that "I find social media discussions about agricultural technology helpful in making informed decisions" while 8.0% did not communicate their view and 7.4% of respondents couldn't help contradict this

announcement. The mean score was 4.23 which demonstrated a moderate degree of consent to the announcement.

Hypothesis 2: The use of social media for peer-to-peer communication among farmers enhances the exchange of practical knowledge and experiences, thereby facilitating the adoption of new agricultural technologies.

Table 5

The adoption of new agricultural technologies

	Statements	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %	Mean
9.	I am open to trying new agricultural technologies on my farm.	2.7	6.7	12.0	48.7	30.7	3.99
10.	New agricultural technologies have significantly improved my farm's productivity.	6.0	6.0	17.3	38.7	32.0	3.85
11.	I feel confident in my ability to use new agricultural technologies effectively.	14.0	10.7	3.3	40.0	32.0	3.65
12.	I believe that adopting new agricultural technologies is essential for the future of farming.	10.0	2.7	7.3	53.3	26.7	3.84
13.	I regularly seek information about new agricultural technologies.	0	10.0	4.0	36.0	50.0	4.26
14.	The cost of new agricultural technologies is a barrier to their adoption on my farm.	2.0	10.0	10.0	40.7	37.3	4.01
15.	I have received adequate training on how to use new agricultural technologies.	4.7	10.0	0.7	56.0	28.7	3.94
16.	Peer recommendations influence my decision to adopt new agricultural technologies.	2.0	8.0	10.0	31.3	48.7	4.17
17.	Government incentives or subsidies play a crucial role in my adoption of new agricultural technologies.	2.7	14.7	12.0	38.7	32.0	3.83
18.	I have seen noticeable benefits since adopting new agricultural technologies.	1.3	8.7	11.3	34.0	44.7	4.12

- Statement 9 shows that 80.7% of the respondents concurred that "Social media provides a platform for sharing my experiences with new agricultural technology" while 12.0%

nobody communicated their perspectives 7.3% of respondents couldn't help contradicting this announcement. The mean score was 4.18 which demonstrated that the announcement was genuinely acknowledged.

- Statement 10 shows that 79.4% dominant part of the respondents concurred that "I believe that farmers who are early adopters of new agricultural technology are more active on social media." 12.0% communicated their view and 8.7% of respondents couldn't help contradicting this announcement. The mean score was 3.99 which indicated the acknowledgment of the announcement.
- Statement 11 shows that 70.7% of the respondents concurred that " Social media allows me to connect with agricultural suppliers or companies offering new technology products." 17.3% did not communicate their view and 12.0% of respondents couldn't help contradicting this announcement. The mean score determined was 3.85 which shows that the announcement is acknowledged.
- Statement 12 shows that 72.0% of the respondents concurred that "Social media advertisements about agricultural technology products influential in my decision-making" while, 3.3% did not communicate their view and 24.7% respondents couldn't help contradicting this announcement. The mean score was 3.65 which demonstrated a moderate degree of concurrence with the announcement.
- Statement 13 shows that 80.0% of the respondents concurred that " I have encountered challenges in adopting new agricultural technology that were discussed or addressed on social media." while 7.3% did not communicate their perspectives and 12.7% of respondents couldn't help contradicting this announcement. The mean score was 3.84 which demonstrates that utilization of the web has a negative impact on understudy conduct.
- Statement 14 shows that 86% of the respondents concurred that " Social media discussions about agricultural technology have influenced my perception of the risks involved in adoption", 4.0% did not communicate their view and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.26 which demonstrated a significant level of consent to the announcement.
- Statement 15 shows that 78.0% greater part of the respondents concurred that " Social media platforms provide sufficient information about the benefits of new agricultural technology" while 10.0% did not communicate their perspectives and 12.0% of respondents couldn't help contradicting this announcement. The mean score was 4.01 which demonstrated the most elevated level of understanding of the announcement.
- Statement 16 shows that 84.7% of the respondents concurred that" I prefer to seek advice or recommendations on agricultural technology through social media rather than traditional sources" while .7% did not communicate their perspectives and 14.7% of respondents couldn't help contradicting this announcement. The mean score was 3.94 which shows that the announcement was acknowledged.
- Statement 17 shows that 80.0% of the vast lion's share of the respondents concurred that" Social media has increased my awareness of government initiatives or programs related to agricultural technology adoption" while 10.0% were unsure while 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.17 which indicated the most elevated acknowledgment of the announcement.
- Statement 18 shows that 70.7% of the respondents concurred that "I have participated in online forums or groups related to agricultural technology to seek or share information" while 12.0% did not communicate and 17.4% of respondents couldn't help contradicting this announcement. The mean score was 3.83 which indicated a genuinely decent understanding level.

Hypothesis 3: Access to educational content about agricultural technologies on social media platforms

improves farmers' understanding and skills, resulting in more widespread technology adoption.

Table 6

Educational Content on Agricultural Technologies via Social Media Platforms

	Statements	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %	Mean
19.	I find educational videos about agricultural technologies on social media platforms informative.	4.0	18.0	10.7	12.0	54.7	3.97
20.	Social media platforms provide diverse and relevant educational content about agricultural technologies.	7.3	2.7	4.7	42.0	43.3	4.11
21.	Educational posts on social media have improved my understanding of advanced agricultural techniques.	2.7	16.0	0	61.3	20.0	3.80
22.	I actively seek out educational content about agricultural technologies on social media.	1.3	8.7	11.3	34.0	44.7	4.12
23.	The quality of educational content about agricultural technologies on social media platforms is comparable to traditional sources (e.g., textbooks, and workshops).	1.3	8.7	11.3	34.0	44.7	4.12
24.	Social media platforms have expanded my knowledge of sustainable agricultural practices.	4.0	5.7	5.3	32.7	52.3	4.24
25.	I have shared educational content about agricultural technologies with others on social media.	1.3	8.7	11.3	34.0	44.7	4.12
26.	The educational content on social media has influenced my decision to adopt specific agricultural technologies.	1.3	6.7	12.7	38.7	40.7	4.11
27.	Social media platforms are effective in addressing my specific questions or concerns about agricultural technologies.	0.7	6.7	8.0	38.0	46.7	4.23
28.	I trust the accuracy of educational content about agricultural technologies shared on social media.	1.3	8.7	11.3	34.0	44.7	4.12

- Statement 19 indicates that 78.7% of the respondents concurred that " Social media has shortened the time it takes for me to adopt new agricultural technology" while 11.3% did not communicate their perspectives and 10% of respondents couldn't help contradicting this announcement. The mean score was 4.12 which indicated the acknowledgment of the announcement.
- Statement 20 shows that 66.7% of the respondents concurred that "I find educational videos about agricultural technologies on social media platforms informative." 10.7% did not communicate their perspectives and 22.0% of respondents couldn't help contradicting this announcement. The mean score was 3.97 which demonstrated the understanding of the announcement with respect to the understudies.
- Statement 21 indicates that 85.3% of the respondents concurred that "Social media platforms provide diverse and relevant educational content about agricultural technologies." 4.7% did not communicate their perspectives and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.11 which indicated a great degree of acknowledgment of the proclamation.
- Statement 22 shows that 81.3% of the respondents concurred that "Educational posts on social media have improved my understanding of advanced agricultural techniques." 0% did not communicate their perspectives and 18.7% of respondents couldn't help contradicting this announcement. The mean score was 3.80 which shows a more elevated level of acknowledgment of explanation.
- Statement 23 indicates that 78.7% of the respondents concurred that "I actively seek out educational content about agricultural technologies on social media." 11.3% did not communicate their perspectives and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.12 which shows the most elevated acknowledgment of explanation.
- Statement 24 indicates that 78.7% of the respondents concurred that "The quality of educational content about agricultural technologies on social media platforms is comparable to traditional sources (e.g., textbooks, workshops)." 11.3% did not communicate their perspectives and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.12 which shows the most noteworthy acknowledgment level.
- Statement 25 indicates that 85.0% of the respondents concurred that "Social media platforms have expanded my knowledge of sustainable agricultural practices." 5.3% did not communicate their perspectives and 9.7% of respondents couldn't help contradicting this announcement. The mean score was 4.24 which shows acknowledgment of the announcement.
- Statement 26 indicates that 78.7% of the respondents concurred that "I have shared educational content about agricultural technologies with others on social media." 11.3% did not communicate their perspectives and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.12 which shows a genuinely decent understanding level.
- Statement 27 indicates that 79.4% of the respondents concurred that “Educational content on social media has influenced my decision to adopt specific agricultural technologies. 8.7" while 12.7% did not communicate their view and 8.0% respondents couldn't help contradicting this announcement. The mean score was 4.11 which shows a more significant level of acknowledgment.
- Statement 28 indicates that 84.7% of the respondents concurred that "Social media platforms are effective in addressing my specific questions or concerns about agricultural technologies." 8.0% did not communicate their view and 7.4% of respondents couldn't help

contradicting this announcement. The mean score was 4.23 which indicated a more significant level of acknowledgment.

Hypothesis 4: Social media campaigns by agricultural organizations and technology developers are more effective in promoting new agricultural technologies compared to traditional media methods.

Table 7

Social media campaigns by agricultural organizations and technology developers

	Statements	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %	Mean
29.	Social media campaigns by agricultural organizations effectively raise awareness about new technologies.	2.7	6.0	12.0	48.7	30.7	3.99
30.	Social media campaigns by agricultural organizations effectively raise awareness about new technologies.	6.0	6.0	17.3	38.7	32.0	3.85
31.	I find social media campaigns by agricultural organizations informative and engaging.	12.7	12.0	3.3	42.0	32.0	3.65
32.	Social media campaigns have influenced my perception of agricultural technologies positively.	8.0	5.3	5.3	52.7	28.7	3.89
33.	I have participated in or shared content from social media campaigns by agricultural organizations.	0	12.0	4.0	37.3	46.7	4.19
34.	Social media campaigns effectively communicate the benefits of adopting new agricultural technologies.	2.0	9.3	11.3	42.7	34.7	3.99
35.	Social media campaigns have influenced my decision to learn more about specific agricultural technologies.	5.3	12.0	0.7	53.3	28.7	3.88
36.	I trust the information shared in social media campaigns by agricultural organizations and technology developers.	2.0	10.7	10.0	32.7	44.7	4.07/
37.	Social media campaigns effectively engage with farmers and address their concerns about new technologies.	2.7	16.7	10.7	40.0	30.0	3.78
38.	I have taken action (e.g., attending events, and contacting providers) as a result of social media campaigns by agricultural organizations.	1.3	9.3	10.7	36.7	42.0	4.09

- Statement 29 shows that 78.7% of the respondents concurred that "I trust the accuracy of educational content about agricultural technologies shared on social media." 11.3% did not communicate their perspectives and 10.0% of respondents couldn't help contradicting this announcement. The mean score was 4.12 which indicated that the announcement was genuinely acknowledged.
- Statement 30 shows that 79.4% of the respondents concurred that "Social media campaigns by agricultural organizations effectively raise awareness about new technologies." 12.0% did not communicate their perspectives and 8.7% of respondents couldn't help contradicting this announcement. The mean score was 3.99 which demonstrated a more significant level of acknowledgment.
- Statement 31 shows that 70.7% of the respondents concurred that "Social media campaigns by agricultural organizations effectively raise awareness about new technologies." 17.3% did not communicate their perspectives and 12% of respondents couldn't help contradicting this announcement. The mean score was 3.83 which demonstrated a more significant level of acknowledgment.
- Statement 32 shows that 72.0% of the respondents concurred that "I find social media campaigns by agricultural organizations informative and engaging." 3.3% did not communicate their perspectives and 24.7% of respondents couldn't help contradicting this announcement. The mean score was 3.65 which demonstrated a more elevated level of acknowledgment.
- Statement 33 shows that 81.4% of the respondents concurred that "Social media campaigns have influenced my perception of agricultural technologies positively." 5.3% did not communicate their perspectives and 13.3% of respondents couldn't help contradicting this announcement. The mean score was 3.89 which indicates a more significant level of acknowledgment.
- Statement 34 shows that 84.0% of the respondents concurred that "I have participated in or shared content from social media campaigns by agricultural organizations." 4.0% did not communicate their perspectives and 12.0% of respondents couldn't help contradicting this announcement. The mean score was 4.19 which indicated a more significant level of acknowledgment.
- Statement 35 shows that 77.4% of the respondents concurred that "Social media campaigns effectively communicate the benefits of adopting new agricultural technologies." 11.3% did not communicate their perspectives and 11.3% of respondents couldn't help contradicting this announcement. The mean score was 3.99 which demonstrated a more significant level of acknowledgment.
- Statement 36 shows that 82.0% of the respondents concurred that "Social media campaigns have influenced my decision to learn more about specific agricultural technologies." while .7% did not communicate their perspectives and 17.0% of respondents couldn't help contradicting this announcement. The mean score was 3.88 which demonstrated a more significant level of acknowledgment.
- Statement 37 shows that 77.4% of the respondents concurred that "I trust the information shared in social media campaigns by agricultural organizations and technology developers." 10.0% did not communicate their perspectives and 12.7% of respondents couldn't help contradicting this announcement. The mean score was 4.07 which indicated a more significant level of acknowledgment.
- Statement 38 shows that 70.0% of the respondents concurred that "Social media campaigns effectively engage with farmers and address their concerns about new technologies." 10.7% did not communicate their perspectives and 19.4% of respondents couldn't help contradicting this announcement. The mean score was 3.78 which demonstrated a more significant level of acknowledgment.

Hypothesis 5: The interaction and feedback mechanisms available on social media platforms enable technology developers to refine agricultural technologies based on user feedback, thereby increasing their adoption rate.

Table 8

The interaction and feedback mechanisms available on social media platforms

	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
		%	%	%	%	%	
39.	I find it easy to interact with agricultural experts and technology developers on social media platforms.	4.3	17.3	12.0	10.7	55.3	3.96
40.	Social media platforms allow me to ask questions and receive timely responses about agricultural technologies.	7.3	1.3	5.3	42.0	44.0	4.14
41.	I value the feedback and comments from other farmers on social media regarding agricultural technologies.	2.7	14.7	0	60.7	22.0	3.85
42.	Social media platforms encourage discussions and exchanges of ideas about agricultural technologies.	0	6.7	12.0	35.3	46.0	4.21
43.	I have provided feedback on agricultural technologies through social media platforms.	4.7	6.7	6.7	30.7	50.7	4.18

- Statement 39 indicates that 78.7% of the respondents concurred that "I have taken action (e.g., attending events, contacting providers) as a result of social media campaigns by agricultural organizations." 10.7% did not communicate their perspectives and 10.6% of respondents couldn't help contradicting this announcement. The mean score was 4.09 which demonstrated a more elevated level of acknowledgment.
- Statement 40 indicates that 66.0% of the respondents concurred that "I find it easy to interact with agricultural experts and technology developers on social media platforms." 12.0% did not communicate their perspectives and 21.6% of respondents couldn't help contradicting this announcement. The mean score was 3.96 which indicated a more elevated level of acknowledgment.
- Statement 41 indicates that 86.0% of the respondents concurred that" Social media platforms are effective channels for disseminating information about new agricultural technology", 5.3% did not communicate their view and 8.6% respondents disagreed. The mean score was 4.14 which indicated that the announcement was acknowledged.
- Statement 42 indicates that 82.7% of the respondents concurred that" I frequently use social media to learn about new agricultural technologies", 0% did not communicate their view and 17.4% of respondents disagreed. The

mean score was 3.85 and the level of agreement with the statement is high.

- Statement 43 indicates that 81.3% of the respondents concurred that" Social media interactions with other farmers influence my decision to adopt new agricultural technology." while 12% did not communicate their view and 6.7% of respondents disagreed. The average of responses is 4.21 which means that the level of disagreement is high.

Social media interactions with other farmers can be incredibly influential when it comes to adopting new agricultural technology. Seeing real-life experiences, success stories, and challenges shared by fellow farmers can provide valuable insights and build confidence in trying out new tools or techniques. Moreover, engaging in discussions and exchanging ideas with peers allows for a better understanding of how specific technologies might fit into one's own farming practices and operations. This shared nature of social media serves to build a sense of trust and cooperation among the agricultural community, eventually leading to informed decision-making about adopting technology. Have you found specific interactions of communities on social media particularly useful in shaping your decisions?

Data Analysis Related Findings

Social media enables farmer-to-farmer interaction, which enables the exchange of experiences of farmers in adopting new farm technologies. Success stories and positive testimonials can incentivize others to experiment with similar innovations while exchanging stories about problems and solutions can offer informative tips to potential adopters.

Social media sites are knowledge banks containing information regarding emerging agricultural technologies, making available product details, user ratings, tutorials, and troubleshooting information at the click of a button. This availability can minimize information bottlenecks that can otherwise delay the uptake.

Conclusion

Social media has emerged as a powerful driver of accelerating the adoption of new farm technologies. By enabling instantaneous sharing of information, farmer-to-farmer discussion, and specialist advice, social media significantly enhances awareness and adoption. The study emphasizes that social media sites such as Facebook, WhatsApp, and YouTube are important channels for communicating agricultural innovations that expose farmers to novel practices, market data, and specialist advice.

One of the strongest points about social media is that it brings extension personnel, farmers, and researchers together. Extension services of agriculture have never suffered from outreach issues, but social media provides direct interaction, and farmers can make decisions quickly. Additionally, internet websites offer places where communities can be established where the farmers can learn by doing, address problems, and feel secure in trying new things.

In conclusion, social media has revolutionized the dissemination of agricultural information, and its potential can only be harnessed with well-designed policies and strategies. With its strengths and limitations, social media can be a game-changer in advocating for sustainable agriculture and food security in the future.

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