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FACTORS INFLUENCING SOCIAL MEDIA ADOPTION AND ITS IMPACT ON AGRICULTURAL DISTRIBUTION IN MOUNTAINOUS REGIONS OF HIMACHAL PRADESH

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ABSTRACT
This study examined the factors influencing the adoption of social media and consequent impact on agricultural distribution in the regions of mountainous districts Kullu and Shimla in Himachal Pradesh, India. Social media has come to light as a revolutionary tool that offers farmers the ability to predict the traditional barriers in the agricultural value chain. This research provides the critical insights into the drivers and barriers of social media adoption by the farmers, where the most influencing factors have been explored to investigate the level of adoption of social media and its impact on farmers and their income growth after using it for a purpose over the years. It employed the primary survey design and data were collected with the support of structured questionnaire using statistical techniques. Results indicate that the farmers adoption rate for social media in these regions has increased in the last three years and seek guidance to adopt it for more agricultural activities. Also, technical literacy, lack of guidance, lack of skills and poor internet access in some regions have been major problems. By using correlation in this study, relationships among number of years of experience using social media, frequency of using social media daily, education level of farmers have been some of the key variables. Technology Acceptance Model (TAM) has been used in this study to carry out internal statistically significant relationships between the hypotheses and to check behavioral intention (BI) of adoption of social media by the farmers as a marketing tool for their agricultural produce. Perceived usefulness (PU) and perceived ease of use (PEOU) demonstrated positive associations on behavior intention (BI) for the farmers of mountainous regions of Himachal Pradesh.

Keywords: Adoption of Social Media, Agricultural Distribution, Digital India, Social Media in Agriculture, TAM in Agriculture, Technology Adoption, Farmers of Himachal Pradesh.

INTRODUCTION

Social media emerges as the preferred mode of communication, catering to individuals of all age groups, from the young to the elderly. It has changed the trend of personal and professional communication. It is challenging to classify the right platform and categorize it, as it depends upon the user's preference and integration of new features. WhatsApp, Facebook, and YouTube held greater familiarity at the grassroots level among various social media platforms (Sandeep et al., 2020). In a study ((Xie, 2021), factors like information, change, and diversity are most significant factors in present times, this period is known as the era of revolution in knowledge and interaction. Social networking was found effective in creating knowledge (Nain et al., 2019).

Some agricultural applications provide farmers information on agricultural practices and increase the wide scope of agricultural extension and advisory services. Despite the many advantages, the use of these services in emerging countries are still low, primarily due to economic constraints and infrastructure limitations (Jijina, 2016). Social media namely Facebook, Instagram, WhatsApp, X, and YouTube are very economical to disseminate the

information and are followed by most of the farming community. As use of social media has increased in rural areas, skill and awareness are required to develop to use ICT tools like social media by farming communities for their benefits (Panda, et al., 2019). Furthermore, over the past decade, extension delivery systems leveraging Information and Communication Technology (ICT) have evolved into an innovative and farmer-friendly approach, characterized by convergence-based methods and diversified crop support (Ghosh, et al., 2021).

According to social network and adoption theories, an individual's behaviour is more significantly influenced by their relationships, networks, and interactions, rather than solely by their own values and character traits. The primary challenges lie in finding the most effective approach to developing a process for adopting social media successfully. To harness the full potential of social media for agricultural practices, there is a need to encourage more farmers to embrace it. Additionally, relevant agencies should provide support for this initiative, including training in social media use and the establishment of a social media policy (Kanjina, 2021).

The purpose of this study is to investigate the factors that encourage farmers to adopt social media as an agricultural distribution channel for information gathering, sharing product information, easy market access and business development, raising awareness towards issues affecting agriculture.

It also evaluates the challenges that might stop social media from being widely adopted by the farmers for agriculture distribution in mountainous regions. After the thoroughly in depth examination of the perspective of the farmers towards adoption of social media in agriculture product distribution this research tries to provide some valuable insights that can guide the development of strategies to improve agriculture distribution process in the regions of Kullu and Shimla districts.

LITERATURE REVIEW

Communication and interaction trends have transformed over the period throughout various sectors that primarily modifies how organizations, individuals and communities engage with the information. (Ngai et al., 2014). The adoption of social media in mountainous agricultural regions like Himachal Pradesh presents some different factors influencing its use and impact on agricultural distribution (Sindakis & Showkat, 2024). A variety of factors have shaped the farmers' decision to adopt or reject agriculture technology and made it necessary to understand the choices by developing a thorough conceptual framework (Adnan et al., 2025). The adoption of digital platforms are significantly affected by the influence of friends and family members, variable of trust, external visibility (Dhaygude & Chakraborty, 2020). In rural regions, innovation in agriculture, education, healthcare and communication are reshaping economic, social and cultural dimensions (Sennuga, 2025). Digital technology provides improved productivity, sustainability and potential in agriculture by offering new opportunities (Balyan et al., 2024).

While social media platforms have shown their potential in transforming agricultural practices, in adopting these technologies farmers' of developing nations encounter significant problems, including less access to infrastructure, lack of digital skills, and limited target content (Smidt & Jokonya, 2021). Research based on attributes of diffusion of innovation on smallholder farmers, investigated the relationship between the

socioeconomic characteristics and attributes of the diffusion of innovation theory that influence adoption of social media among smallholder farmers in the Nkomazi local municipality, Mpumalanga, South Africa. Negative impacts were seen in the level of literacy and education of smallholder farmers and their adoption of social media (Zondo, et al., 2023). The internet and use of social media positively correlates with the adoption of socialized agricultural services by the farmers (Yang et al., 2023). Social media platforms have become predominant channels for significantly enhancing farmers' knowledge about agriculture technologies and disseminating agricultural information (Pattabhi et al., 2023). Irrespective of these advantages, the overall adoption of social media among farmers remains low with a majority not using it for agricultural information (Kajina, 2021). Some factors such as age, education level, and product suitability play a role in influencing farmers' adopting social media as a marketing tool in agriculture (Han et al., 2021). In a study conducted to understand factors that motivate rural farmers adoption of social media marketing (SMM) tools in China, researchers defined and extended the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to China's agriculture sector. Specifically, they proposed product social media marketing suitability as a new influencing factor based on the product. Broader adoption is very crucial to harness the potential of social media in agriculture. Support from government and relevant agencies like extension service are equally important. The requirement of formulation of new guidelines and policies that motivate online advisory services and dissemination of information. Yet, the effectiveness and extent of this technological integration depends on a greater understanding of the specific regional challenges and opportunities, particularly in areas distinguished by particular geographical and socio-economic conditions (Tokiran et al., 2021).

After considering all these factors, it becomes essential to fundamentally examine and evaluate the existing literature on adoption of social media and its impact on agricultural distribution in mountainous regions with a specific focus in Kullu and Shimla districts situated in Himachal Pradesh, India. Some factors, farmers' trust in information sources, language barriers, and relevant content to local farming practices are all important considerations.

OBJECTIVES

Objective 1 To Study Impact of TAM Model on Agricultural Distribution in Mountainous regions of Himachal Pradesh.

Objective 2 To Study Relationship among Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution in Mountainous regions of Himachal Pradesh.

HYPOTHESES

Null Hypothesis H_{01A}: There is no significant difference in Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

Alternate Hypothesis H_{11A}: There is a significant difference in Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

Null Hypothesis H_{01B}: There is no significant difference in Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

Alternate Hypothesis H_{11B}: There is a significant difference in Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

Null Hypothesis H_{01C}: There is no significant difference in Impact of Behaviour Intention in Agricultural Distribution according to annual income.
Alternate Hypothesis H_{11C}: There is a significant difference in Impact of Behaviour Intention in Agricultural Distribution according to annual income.
Null Hypothesis H_{02}: There is no relationship among the Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution.
Alternate Hypothesis H_{12}: There is a relationship among the Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution.

METHODS

In this study, conclusive research design was used with the help of a survey method. A total of 110 farmers from the regions of Kullu and Shimla districts were taken for the study. Data collection consisted of crop farming, livestock farming and mixed farming that were using social media platforms (Facebook, WhatsApp, Instagram, YouTube and X) in the regions. Technology Acceptance Model (TAM) and correlation analysis were used to check the reliability, validity and association between encouraging factors to adoption of social media. Reliability was checked using Cronbach's Alpha test with .92 score for overall constructs which indicates an excellent consistency by suggesting that the questionnaire is reliable to do further data collection to measure the predicted constructs.

DATA ANALYSIS

DEMOGRAPHIC FACTOR

Sr No.	Particular	Category	Frequency	Percent
1	Gender	Male	100	90.9
		Female	10	9.1
2	Education level of respondent	No formal education	17	15.5
		Primary	21	19.1
		High school	19	17.3
		Senior Secondary	16	14.5
		Under Graduate	37	33.6
3	Farming experience	Less than 5 years	11	10.0
		5-10 years	27	24.5
		11-15 years	18	16.4
		16-20 years	16	14.5
		More than 20 years	38	34.5
4	Estimated annual income	Less than 3 Lakhs	39	35.5
		3-4 Lakhs	33	30.0
		4-5 Lakhs	20	18.2
		5-6 Lakhs	11	10.0
		More than 7 Lakhs	7	6.4

The frequency numbers in the table highlight the distribution of respondents across different demographic and socio-economic categories. Out of the 110 respondents, a large

majority were male (100), while only 10 were female, showing that men dominated participation in this study. In terms of education, the highest proportion belonged to the under-graduate category (37), followed by primary education (21), high school (19), no formal education (17), and senior secondary (16), indicating that while many respondents had some level of formal education, a considerable section had either minimal or no schooling. Farming experience varied widely, with the largest group having more than 20 years of experience (38), while others had between 5–10 years (27), 11–15 years (18), 16–20 years (16), and less than 5 years (11), reflecting both seasoned and relatively new farmers in the sample. Income distribution showed that most respondents earned less than ₹3 lakhs annually (39), followed by 33 in the ₹3–4 lakh range, 20 in the ₹4–5 lakh bracket, 11 in the ₹5–6 lakh range, and only 7 earning more than ₹7 lakhs, underlining that the majority of farmers belonged to low to moderate income groups. Overall, the frequency values capture both the socio-demographic concentration and economic realities of the farming community studied.

OBJECTIVE AND HYPOTHESIS

Objective 1 To Study Impact of TAM Model on Agricultural Distribution in Mountainous regions of Himachal Pradesh.

Null Hypothesis H_{01A}: There is no significant difference in Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

Alternate Hypothesis H_{11A}: There is a significant difference in Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

To test the above null hypothesis ANOVA test is applied and f-test is obtained results are as follows.

ANOVA					
Perceived Usefulness					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.037	4	.259	1.279	.283
Within Groups	21.281	105	.203		
Total	22.318	109			

Interpretation: The above results indicate that calculated p-value is 0.283. It is more than 0.05. Therefore, f-test is accepted. Hence Null hypothesis is accepted and Alternate hypothesis is rejected.

Conclusion: There is no significant difference in Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

Findings: To understand the findings of hypothesis, mean score of Impact of Perceived Usefulness in Agricultural Distribution according to annual income.

Report			
Perceived Usefulness			
Estimated annual income from farm of the respondent	Mean	N	Std. Deviation
Less than 3 Lakhs	3.9103	39	.44401
3-4 Lakhs	3.8283	33	.37148

4-5 Lakhs	3.9667	20	.53147
5-6 Lakhs	3.9394	11	.38205
More than 7 Lakhs	4.2381	7	.65162
Total	3.9197	110	.45250

The results indicate how perceived usefulness of the system varies across respondents based on their estimated annual farm income. Respondents earning less than 3 lakhs (Mean = 3.91) and those in the 3–4 lakh category (Mean = 3.82) reported almost similar levels of perceived usefulness, with relatively lower variation. Interestingly, the mean score slightly increases for respondents in the 4–5 lakh (Mean = 3.97) and 5–6 lakh categories (Mean = 3.94), suggesting a higher level of acceptance of usefulness with rising income. The highest mean score is observed among those earning more than 7 lakhs (Mean = 4.24), indicating that higher-income farmers perceive the system as significantly more useful, though this group also shows greater variability (Std. Deviation = .65). Overall, the total mean across all income categories is 3.92, showing a generally favorable perception of usefulness, with a trend that perceived usefulness tends to increase with higher income levels.

Null Hypothesis H_{01B}: There is no significant difference in Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

Alternate Hypothesis H_{11B}: There is a significant difference in Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

To test the above null hypothesis ANOVA test is applied and f-test is obtained results are as follows.

ANOVA					
Perceived Ease of Use					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.921	4	.480	3.102	.019
Within Groups	16.260	105	.155		
Total	18.181	109			

Interpretation: The above results indicate that calculated p-value is 0.019. It is less than 0.05. Therefore, f-test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

Conclusion: There is a significant difference in Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

Findings: To understand the findings of hypothesis, mean score of Impact of Perceived Ease of Use in Agricultural Distribution according to annual income.

Report			
Perceived Ease of Use			
Estimated annual income from farm of the respondent	Mean	N	Std. Deviation
Less than 3 Lakhs	3.9077	39	.34092
3-4 Lakhs	3.9545	33	.42343
4-5 Lakhs	3.8833	20	.43963
5-6 Lakhs	3.9545	11	.36584

More than 7 Lakhs	4.4524	7	.42725
Total	3.9567	110	.40841

The analysis of perceived ease of use across income groups shows that farmers in different income brackets generally rate the system positively, with mean scores close to 4. Respondents earning less than 3 lakhs (Mean = 3.91) and those earning between 4–5 lakhs (Mean = 3.88) have slightly lower perceptions compared to other groups, indicating moderate satisfaction. Farmers in the 3–4 lakh and 5–6 lakh categories both reported a mean of 3.95, reflecting consistent ease of use across these income levels. However, the group earning more than 7 lakhs stands out with the highest mean score of 4.45, suggesting that higher-income farmers find the system significantly easier to use. The low standard deviations across all groups (.34 to .43) indicate stable responses within each category. Overall, the total mean of 3.96 highlights a favorable perception of ease of use, with a clear upward trend among the higher-income respondents.

Null Hypothesis H_{01C}: There is no significant difference in Impact of Behaviour Intention in Agricultural Distribution according to annual income.

Alternate Hypothesis H_{11C}: There is a significant difference in Impact of Behaviour Intention in Agricultural Distribution according to annual income.

To test the above null hypothesis ANOVA test is applied and f-test is obtained results are as follows.

ANOVA					
Behaviour Intention					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.649	4	.912	2.516	.046
Within Groups	38.069	105	.363		
Total	41.718	109			

Interpretation: The above results indicate that calculated p-value is 0.046. It is less than 0.05. Therefore, f-test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

Conclusion: There is a significant difference in Impact of Behaviour Intention in Agricultural Distribution according to annual income.

Findings: To understand the findings of hypothesis, mean score of Impact of Behaviour Intention in Agricultural Distribution according to annual income.

Report			
Behaviour Intention			
Estimated annual income from farm of the respondent	Mean	N	Std. Deviation
Less than 3 Lakhs	3.7949	39	.61471
3-4 Lakhs	3.7727	33	.57406
4-5 Lakhs	3.8750	20	.62566
5-6 Lakhs	4.0455	11	.47194
More than 7 Lakhs	4.5000	7	.76376
Total	3.8727	110	.61866

The results for behavioural intention across farm income levels show a gradual upward trend, with higher-income respondents demonstrating stronger intentions to use the system. Farmers earning less than 3 lakhs (Mean = 3.79) and those in the 3–4 lakh bracket (Mean = 3.77) report nearly identical levels of behavioural intention, reflecting moderate acceptance. The 4–5 lakh group shows a slight increase (Mean = 3.88), while respondents in the 5–6 lakh category display a higher mean of 4.05, indicating stronger willingness to adopt. The highest behavioural intention is observed among farmers earning more than 7 lakhs (Mean = 4.50), though this group also shows greater variability (Std. Deviation = .76). Overall, the total mean across all respondents is 3.87, suggesting generally positive behavioural intention, with a clear trend that higher income is associated with stronger willingness to use the system.

Objective 2 To Study Relationship among Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution in Mountainous regions of Himachal Pradesh.

Null Hypothesis H_{02}: There is no relationship among the Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution.

Alternate Hypothesis H_{12}: There is a relationship among the Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution.

To test the above null hypothesis Correlation test is applied and obtained results are as follows.

Correlations

		Perceived Usefulness	Perceived Ease of Use	Behaviour Intention
Perceived Usefulness	Pearson Correlation	1	.750**	.589**
	P-value		.000	.000
	N	110	110	110
Perceived Ease of Use	Pearson Correlation	.750**	1	.591**
	P-value	.000		.000
	N	110	110	110
Behaviour Intention	Pearson Correlation	.589**	.591**	1
	P-value	.000	.000	
	N	110	110	110
**. Correlation is significant at the 0.01 level (2-tailed).				

Interpretation: The above results indicate that calculated p-value is 0.046. It is less than 0.05. Therefore, correlation test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

Conclusion: There is a relationship among the Perceived Usefulness, Perceived Ease of Use and Behaviour Intention on Agricultural Distribution.

Findings: The correlation analysis shows strong and significant positive relationships among the three variables: perceived usefulness, perceived ease of use, and behavioural intention. Perceived usefulness is highly correlated with perceived ease of use ($r = .750$, $p < 0.01$), indicating that as users find a system easier to use, they are also more likely to

perceive it as useful. Both perceived usefulness ($r = .589$, $p < 0.01$) and perceived ease of use ($r = .591$, $p < 0.01$) are significantly correlated with behavioural intention, suggesting that when users view a system as easy to use and beneficial, their intention to adopt or continue using it increases. All correlations are significant at the 0.01 level, confirming robust associations and supporting the Technology Acceptance Model (TAM) framework, where ease of use and usefulness jointly influence behavioural intention.

DISCUSSION

The findings from the ANOVA tests provide an important understanding of how farmers' annual income influences the constructs of the TAM model in agricultural distribution. For perceived usefulness, the analysis revealed no significant difference across income groups, as indicated by a p-value greater than 0.05. This suggests that irrespective of their income level, farmers in the mountainous regions of Himachal Pradesh largely perceive the system as useful in enhancing agricultural distribution. The mean scores, which remain fairly stable across income categories, confirm that usefulness is consistently valued, though a slight upward trend is visible among higher-income farmers. This stability highlights that usefulness is a universal perception not strongly shaped by income differences.

In contrast, perceived ease of use demonstrated significant variation across income levels, with the ANOVA test producing a p-value below 0.05. Farmers in higher-income brackets, particularly those earning more than 7 lakhs, reported substantially higher ease-of-use scores compared to other groups. This outcome suggests that wealthier farmers may have better access to technology, greater exposure to modern agricultural practices, or stronger educational backgrounds that make systems easier to understand and operate. The result underlines the role of socio-economic status in shaping farmers' ability to adopt and effectively use digital platforms or distribution technologies.

Behavioural intention also showed significant differences according to income, with higher-income farmers expressing stronger intentions to adopt the system. This aligns with the idea that behavioural intention is influenced by both perceived usefulness and perceived ease of use, which together enhance willingness to adopt. The increasing mean scores from lower- to higher-income categories demonstrate that economic capacity may drive greater confidence in investing time and resources into new agricultural distribution methods. These findings suggest that while usefulness is universally recognized, ease of use and adoption intention are shaped more strongly by economic standing.

The correlation results further validate the TAM framework by showing strong and significant positive relationships among perceived usefulness, perceived ease of use, and behavioural intention. The high correlation between usefulness and ease of use indicates that when a system is easy to use, farmers also view it as more useful. Both factors strongly correlate with behavioural intention, reinforcing the theoretical proposition that perceived ease of use and usefulness are key predictors of adoption behaviour. This relationship underscores the importance of designing user-friendly and practically beneficial systems for agricultural distribution. For policymakers and system developers, the implication is clear: ensuring simplicity of use while demonstrating tangible benefits can foster greater adoption across diverse farmer groups, with special focus on supporting lower-income farmers to overcome usability challenges.

CONCLUSION

The analysis of perceived usefulness indicates that income does not significantly influence how farmers view the benefits of the system. Farmers across income categories recognized the usefulness of adopting technological solutions in agricultural distribution, suggesting that perceived benefits are universal in nature. This finding is particularly relevant because it indicates that the usefulness of technology transcends socio-economic differences and is appreciated equally by small and large farmers. On the other hand, perceived ease of use varied significantly by income group. Higher-income farmers perceived the system as much easier to use, with the highest scores among those earning above 7 lakhs. This finding suggests that economic factors, possibly linked to better education, infrastructure, or prior exposure to technology, play a role in shaping ease of adoption. Addressing this gap by simplifying technologies and offering targeted training for lower-income groups could ensure more equitable access and use across all farmer categories.

Behavioural intention also showed significant differences across income levels, with higher-income farmers demonstrating stronger willingness to adopt agricultural distribution systems. This pattern reflects the combined influence of ease of use and usefulness on adoption intention. Farmers with more financial capacity may also feel more confident investing in new systems, thus reinforcing their positive behavioural intention. These results suggest that economic status can act as a facilitator or barrier in translating perceived benefits into actual adoption behaviour. Finally, the correlation analysis confirmed strong interrelationships among the TAM constructs. Perceived ease of use and usefulness were highly correlated, and both strongly influenced behavioural intention. This establishes the centrality of TAM in predicting technology adoption in agricultural contexts. Taken together, the findings show that while usefulness is universally acknowledged, ease of use and behavioural intention are more sensitive to income differences. Therefore, interventions should not only focus on promoting the benefits of technology but also ensure accessibility, affordability, and simplicity to encourage adoption among farmers of all income levels, particularly those with lower earnings in mountainous regions.

REFERENCES

1. Ajzen, I., Fishbein, M., Lohmann, S., & Albarracín, D. (2018). The influence of attitudes on behavior. The handbook of attitudes, volume 1: Basic principles, 197-255.
2. Abdulai, A., KC, K. B., & Fraser, E. D. G. (2022). What factors influence the likelihood of rural farmer participation in digital agricultural services? experience from smallholder digitalization in Northern Ghana. Outlook on Agriculture, 52(1), 57. https://doi.org/10.1177/00307270221144641
3. Adnan, N., Rehman, H. M., & Alam, M. N. (2025). Exploring agricultural innovation: an empirical investigation of factors influencing the adoption and non-adoption of smart fertilizer technology among farmers in developing countries. Agriculture & Food Security, 14(1). https://doi.org/10.1186/s40066-025-00529-0
4. Balkrishna, A., Pathak, R., Kumar, S., Arya, V., & Singh, S. K. (2023). A comprehensive analysis of the advances in Indian Digital Agricultural architecture.

Smart Agricultural Technology, 5, 100318. https://doi.org/10.1016/j.atech.2023.100318
5. Balyan, S., Jangir, H., Tripathi, S. N., Tripathi, A., Jhang, T., & Pandey, P. (2024). Seeding a Sustainable Future: Navigating the Digital Horizon of Smart Agriculture. Sustainability, 16(2), 475. https://doi.org/10.3390/su16020475
6. Bashir, T., Tan, Z., Sadiq, B., Niaz, U., Anjum, F., & Mahmood, H. (2022). An assessment of influential factors developing the intention to use social media sites: A technology acceptance model based approach. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.983930
7. Dhaygude, M. S., & Chakraborty, D. (2020). Rethinking Design of Digital Platforms for Emergent Users: Findings from a Study with Rural Indian Farmers. https://doi.org/10.1145/3429290.3429297
8. Hong-hua, H., Xiong, J., & Zhao, K. (2021). Digital inclusion in social media marketing adoption: the role of product suitability in the agriculture sector. Information Systems and E-Business Management, 20(4), 657. https://doi.org/10.1007/s10257-021-00522-7
9. Kanjina, S. (2021). Farmers' Use of Social Media and its Implications for Agricultural Extension: Evidence from Thailand. Asian Journal of Agriculture and Rural Development, 11(4), 302. https://doi.org/10.18488/journal.ajard.2021.114.302.310
10. Mir, S. A., & Padma, T. (2020). Integrated Technology Acceptance Model for the Evaluation of Agricultural Decision Support Systems. Journal of Global Information Technology Management, 23(2), 138. https://doi.org/10.1080/1097198x.2020.1752083
11. Ngai, E. W. T., Tao, S. S. C., & Moon, K. K.-L. (2014). Social media research: Theories, constructs, and conceptual frameworks. International Journal of Information Management, 35(1), 33. https://doi.org/10.1016/j.ijinfomgt.2014.09.004
12. Pandia, S., Sharma, R., Shukla, N., & Sharma, R. (2019). Digitalisation in Agriculture: Roads Ahead. International Journal of Current Microbiology and Applied Sciences, 8(12), 1841. https://doi.org/10.20546/ijcmas.2019.812.219
13. Pattabhi, S. G., Prashanth, P., Sreenivasulu, M., & Madavilata, A. (2023). Effectiveness of social media agricultural information on farmer's knowledge. Environment Conservation Journal, 24(1), 123-129. https://doi.org/10.36953/ECJ.11432297
14. Petraki, D., Gazoulis, I., Kokkini, M., Danaskos, M., Kanatas, P., Rekkas, A., & Travlos, I. (2025). Digital Tools and Decision Support Systems in Agroecology: Benefits, Challenges, and Practical Implementations. Agronomy, 15(1), 236. https://doi.org/10.3390/agronomy15010236
15. Raikar, K., & Gawade, S. (2017). REVIEW OF USABILITY AND DIGITAL DIVIDE FOR ICT IN AGRICULTURE. International Journal of Advanced Research, 5(1), 1366. https://doi.org/10.21474/ijar01/2895
16. Sennuga, S. O. (2025). The Role of Technology in Transforming Rural Social Systems: An Insightful Review. Nutrition and Food Processing, 8(1), 1. https://doi.org/10.31579/2637-8914/281
17. Sharma, A. (2022). ICT in Agriculture: Creating SMART Farmers. Oriental Journal of Computer Science and Technology, 14(10203), 35. https://doi.org/10.13005/ojcst14.010203.04

18. Sindakis, S., & Showkat, G. (2024). The digital revolution in India: bridging the gap in rural technology adoption. Journal of Innovation and Entrepreneurship, 13(1). https://doi.org/10.1186/s13731-024-00380-w
19. Smidt, H. J., & Jokonya, O. (2021). Factors affecting digital technology adoption by small-scale farmers in agriculture value chains (AVCs) in South Africa. Information Technology for Development, 28(3), 558. https://doi.org/10.1080/02681102.2021.1975256
20. Tokiran, N. S. M., Hussin, N., & Shahibi, M. S. (2021). Challenges in Implementation of Digital Culture Environment among Rural Community in Malaysia: An Overview. Journal of Asian Scientific Research, 11(3), 25. https://doi.org/10.18488/journal.2.2021.113.25.33
21. Vyas, M., & Sinoriya, P. (2020). Impact of information and communication technology (e-agriculture) on agriculture and rural development. International Journal of Chemical Studies, 8(2), 56. https://doi.org/10.22271/chemi.2020.v8.i2b.9538
22. Xie, L., Bi-liang, L., & Zhong, W. (2021). How Are Smallholder Farmers Involved in Digital Agriculture in Developing Countries: A Case Study from China. Land, 10(3), 245. https://doi.org/10.3390/land10030245
23. Yang, C., Cheng, C., Cheng, N., & Zhang, Y. (2023). Research on the impact of internet use on farmers' adoption of agricultural socialized services. Sustainability, 15(10), 7823. https://doi.org/10.3390/su15107823
24. Zahar, N., Rao, Ch. S., Belhorma, B., Hermet, P., & Broeders, C. (2016). International Journal of Advanced Research. International Journal of Advanced Research. https://doi.org/10.21474/ijar01
25. Zambrano, P. V. M., Pérez, L. P. T., Valdez, R. E. U., & Orozco, Á. P. F. (2023). Technological Innovations for Agricultural Production from an Environmental Perspective: A Review [Review of Technological Innovations for Agricultural Production from an Environmental Perspective: A Review]. Sustainability, 15(22), 16100. Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/su152216100
26. Zondo, W. N. S., & Ndoro, J. T. (2023). Attributes of Diffusion of Innovation's Influence on Smallholder farmers' social media adoption in Mpumalanga Province, South Africa. Sustainability, 15(5), 4017. https://doi.org/10.3390/su15054017