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A STUDY ON THE LEVEL OF SATISFACTION OF FARMERS FROM THE SERVICES PROVIDED BY AGRICULTURAL TECHNOLOGY, INFORMATION AND E-COMMERCE

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ABSTRACT

Agriculture remains the backbone of the rural economy, yet farmers continue to face problems of fragmented information, uncertain markets and limited access to modern technology. Agricultural technology services, agricultural information services and e-commerce platforms have emerged as important tools to address these problems. This study examines the level of satisfaction of farmers with the services provided through agricultural technology, information and e-commerce. The study concludes that satisfaction depends on the quality, timeliness and accessibility of services, and offers suggestions for service providers and policymakers to strengthen digital agricultural services. Farmers give high importance to all six factors, with information quality being the strongest and cost and economic benefit the weakest. Service providers should give priority to accurate, timely information, together with digital training and reliable delivery, while keeping trust, support and affordability strong

Keywords: Farmer satisfaction, agricultural technology, agricultural information services, e-commerce and digital agriculture

INTRODUCTION

Farming is no longer only about land, labour and rainfall. Today a farmer's income also depends on timely knowledge of weather, crop varieties, pest control, input prices and market demand. Information and communication technology has made it possible to deliver such knowledge directly to the farmer through mobile applications, helplines, extension portals, SMS advisories, social media groups and online marketplaces.

Three streams of service are especially relevant. *Agricultural technology services* include improved seeds, mechanisation, soil testing, drip and precision irrigation, drones and farm management tools. *Agricultural information services* include crop advisories, weather forecasts, market price information, scheme and subsidy details, and extension support. *E-commerce services* allow farmers to buy inputs such as seeds, fertilisers and equipment online and to sell produce through digital marketplaces, reducing dependence on intermediaries.

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Figure: 1



Providing these services is not enough; their value is realised only when farmers find them useful, reliable and easy to use. Satisfaction is therefore a practical measure of whether services are meeting farmers' needs and whether they will continue to use them. This study measures that satisfaction and identifies the factors that influence it.

FACTORS INFLUENCING FARMERS' SATISFACTION

1. Accessibility and Ease of Use

Accessibility refers to how easily farmers can reach and operate agricultural technology, information and e-commerce services. Services delivered through mobile applications, helplines, web portals and online marketplaces are useful only when farmers can open them without difficulty. A simple layout, voice or video support, and availability in the local language make services easier to use, especially for farmers with limited education. Reliable internet connectivity and affordable smartphones are equally important, because a good service loses its value when it cannot be reached. When farmers find a service easy to learn and use, they use it more often and trust it more. Complicated procedures, frequent technical errors and poor network coverage lead to frustration and discourage continued use. Accessibility therefore has a strong influence on how satisfied farmers feel with the overall service.

2. Quality and Reliability of Information

Farmers depend on information to make decisions about sowing, irrigation, pest control, harvesting and selling. The quality of this information, including its accuracy, relevance, clarity and timeliness, therefore strongly shapes their satisfaction. Weather forecasts, crop advisories, market prices and details of government schemes are valuable only when they are correct and arrive at the right time. Advice that is generic, outdated or unsuited to local soil and climate conditions can lead to losses and reduce farmers' confidence in the source. Consistent and dependable information, on the other hand, helps farmers reduce risk, save costs and improve yields, which builds trust over time. Farmers are more satisfied when information is specific to their crop and location and is delivered in a form they can understand and act on without delay.

3. Cost and Economic Benefit

Cost and economic benefit influence satisfaction because farmers judge any service by what it adds to their income. Services that are free or affordable, and that clearly reduce input costs, improve price realisation or raise productivity, are viewed positively. E-commerce

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platforms, for instance, may let farmers sell directly to buyers and avoid intermediaries, while technology services may reduce labour or water use. However, hidden charges, high commissions, expensive equipment or delayed payments can reduce satisfaction even when the service is otherwise good. Small and marginal farmers are particularly sensitive to cost because their margins are narrow. When farmers see that the benefits of using a service clearly exceed what they spend on it, they feel more satisfied and are more likely to keep using it and recommend it to other farmers.

4. Technical Support and Training

Technical support and training help farmers use new technologies and digital services with confidence. Many farmers are unfamiliar with modern tools, apps and online platforms, so hands-on training, field demonstrations and guidance from extension officers play an important role. Helplines, quick problem resolution and after-sales support for equipment and software also increase satisfaction, because farmers know help is available when something goes wrong. Without proper guidance, farmers may use services incorrectly, get poor results and lose interest. Regular training sessions in villages, preferably in the local language and with practical examples, make the learning process easier. When providers offer continued support instead of a one-time introduction, farmers feel supported and valued, which leads to higher satisfaction and stronger adoption of agricultural technology, information and e-commerce services.

5. Trust and Security

Trust and security are especially important in e-commerce, where farmers pay, sell and share personal details online. Farmers are more satisfied when they are confident about transparent pricing, genuine inputs, honest weighing and grading, and secure and simple payment methods. Fear of fraud, fake products, hidden terms or misuse of personal and bank details can make farmers hesitant to use online platforms at all. Trust also depends on the reputation of the service provider, whether a government agency, a cooperative or a private company, and on the experiences of fellow farmers. Positive word of mouth quickly builds confidence, while a single bad experience can spread distrust. Providers that are open about their rates and procedures, protect user data and offer clear complaint mechanisms earn farmers' trust, and this directly raises satisfaction levels.

6. Delivery and Market Linkage

Delivery and market linkage concern how smoothly services turn into real results for farmers. When farmers buy seeds, fertilisers or equipment online, they expect timely delivery of genuine products at the promised price. When they sell produce, they need dependable procurement, fair grading, quick payment and support such as transport, storage and collection points. Delays, damaged goods, poor logistics or difficulty in reaching buyers can cause financial loss, especially for perishable crops. Strong market linkages help farmers reach wider markets, reduce dependence on middlemen and obtain better prices. Quick grievance redressal is also important, because farmers need problems such as wrong deliveries or payment delays to be resolved promptly. Reliable delivery and good market connections show farmers that digital services work in practice, which leads to higher satisfaction.

7. Digital Literacy and Awareness

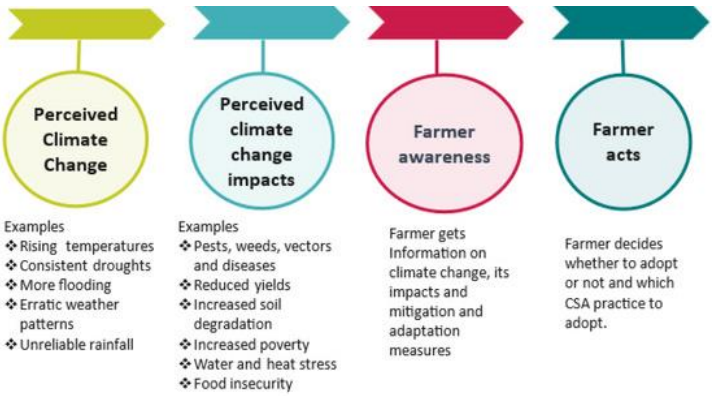
Digital literacy and awareness describe farmers' own ability to use smartphones, apps and online platforms, and their knowledge of which services exist and how to use them. Farmers

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who are comfortable with digital tools can explore features, compare prices, access advisories and complete online transactions without depending on others, so they usually gain more from the services and feel more satisfied. Farmers with low literacy or limited exposure may find the services confusing, underuse them or fail to notice benefits they could receive. Lack of awareness also means many farmers never use schemes and platforms designed for them. Factors such as age, education, experience and exposure to media influence these skills. Awareness campaigns, farmer groups and digital training programmes can close this gap and improve both usage and satisfaction.

Figure: 2



REVIEW OF LITERATURE

Previous research on farmers and digital services broadly points in the same direction. Studies on agricultural extension and ICT report that timely, relevant and locally suited information improves farmers' decisions and their confidence in the source. Research on technology adoption suggests that perceived usefulness and ease of use strongly shape whether farmers continue using a tool. Work on agricultural e-commerce highlights better price realisation and wider market access as benefits, while noting concerns about logistics, trust, digital literacy and payment security. Across these streams, demographic characteristics such as age, education, farm size and

RESEARCH GAP

Several studies have examined agricultural extension, information and communication technology, and online marketing separately, but few have combined them to assess how satisfied farmers are with the overall services they receive. Existing research mostly focuses on awareness, adoption or usage of digital tools, while satisfaction, which shows whether services actually meet farmers' needs, receives less attention. E-commerce in agriculture is also studied mainly from the viewpoint of marketing and supply chains rather than the farmer's own experience. In addition, local evidence on how demographic factors such as age and gender relate to satisfaction is limited. This study addresses these gaps by measuring farmers' satisfaction with agricultural technology, information and e-commerce services together, using primary data collected directly from farmers.

IMPORTANCE OF THE STUDY

The study is important because farmers are the central users of agricultural services, and their satisfaction shows whether these services are truly effective. The findings will help service providers, agri-technology firms and e-commerce platforms understand farmers' expectations and improve the quality, timeliness and accessibility of their services. Government departments and extension agencies can use the results to design better digital agriculture

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programmes and allocate resources wisely. For farmers, improved services mean better decisions, lower costs and fair prices through wider market access. The study also adds to the academic literature on farmer satisfaction and digital agriculture, and provides a base for future researchers who wish to explore the topic in other regions or with larger samples.

STATEMENT OF THE PROBLEM

Although many agricultural technology, information and e-commerce services have been introduced for farmers, their benefits depend on whether farmers find them useful, reliable and easy to use. Farmers often face problems such as limited digital knowledge, poor internet connectivity, delayed or irrelevant advice, doubts about online payments, and difficulty in selling produce or buying inputs online. Without knowing how satisfied farmers actually are, providers cannot correct weaknesses and policymakers cannot judge whether investments are reaching their purpose. Existing evidence on farmer satisfaction with these services taken together is also limited. This study therefore attempts to find out the level of satisfaction of farmers with these services and whether it differs across their personal characteristics. Government agencies, agri-startups and private firms have introduced many technology, information and e-commerce services for farmers. However, adoption is uneven. Farmers may be unaware of services, may find them hard to use because of language, literacy or connectivity barriers, or may not trust online payment and pricing. Advice may arrive late or may not match local conditions. Without understanding how satisfied farmers actually are, providers cannot improve services and policymakers cannot judge whether investment is reaching its purpose. This study addresses that gap by asking: *How satisfied are farmers with the technology, information and e-commerce services available to them, and what influences that satisfaction?*

OBJECTIVES OF THE STUDY

1. To assess the level of awareness of agricultural technology, information and e-commerce services among farmers.
2. To measure the level of satisfaction of farmers with each of these three types of service.
3. To identify the factors influencing farmers' satisfaction.
4. To offer suggestions for improving the services.

HYPOTHESES

- **H1:** There is no significant relationship between the demographic profile of farmers (age, education, farm size, experience) and their level of satisfaction.
- **H2:** There is no significant difference in satisfaction across agricultural technology, information and e-commerce services.
- **H3:** Service quality factors (accessibility, reliability, timeliness, cost, trust) have no significant effect on overall farmer satisfaction.

ANALYSIS AND FINDINGS

Agriculture depends increasingly on timely technology, information and market access. Digital services such as advisory apps, modern farm technologies and e-commerce platforms help farmers make better decisions and sell produce directly. Their value, however, depends on farmer satisfaction. This study examines farmers' satisfaction with these services and its influencing factors.

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Table 1

Results of one-sample t-test for Factors influencing Satisfaction of Farmers from the Services Provided by Agricultural Technology, Information and E-Commerce

Factors	Mean	SD	t	p
Quality and reliability of information.	4.02	.948	32.832	<0.001**
Cost and economic benefit	3.82	.930	31.803	<0.001**
Technical support and training	3.90	.951	31.754	<0.001**
Trust and security	3.85	.954	31.274	<0.001**
Delivery and market linkage	3.98	.983	31.396	<0.001**
Digital literacy and awareness	3.98	.911	33.863	<0.001**

The table shows the mean scores, standard deviations and t-values for the six factors. All six factors have mean scores close to 4 on the five-point scale (3.82 to 4.02), which means farmers agree that each factor influences their satisfaction with agricultural technology, information and e-commerce services.

Ranking of factors:

- **Quality and reliability of information** has the highest mean (4.02), so farmers consider accurate and timely information the most influential factor.
- **Digital literacy and awareness** and **delivery and market linkage** follow with the same mean (3.98).
- **Technical support and training** comes next (3.90), followed by **trust and security** (3.85).
- **Cost and economic benefit** has the lowest mean (3.82), though it is still at a high level.

Standard deviation: The SD values are between 0.911 and 0.983, which shows that farmers' opinions are fairly consistent across all factors. Digital literacy and awareness (0.911) has the most uniform responses, while delivery and market linkage (0.983) has the widest spread of opinions.

t-test: The t-values range from 31.274 to 33.863, and the p-value for every factor is below 0.001, which is significant at the 1 percent level. Therefore the null hypothesis is **rejected** for every factor.

Result: Each of the six factors has a significant influence on farmers' satisfaction with the services provided by agricultural technology, information and e-commerce.

DISCUSSION

The discussion should connect the results to the literature. Where farmers report high satisfaction with information services, this usually reflects the low cost and wide reach of mobile-based advisories. Lower satisfaction with e-commerce typically reflects practical barriers: limited digital literacy, doubts about online payment, delays in procurement of produce or delivery of inputs, and weak grievance redressal. Technology services tend to be rated higher where training and after-sales support are available. If your results differ from these patterns, explain the likely local reasons, such as network coverage, crop type or farm size.

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IMPLICATIONS OF THE STUDY

The findings of the study have practical implications for several groups. Service providers can use the results to improve weaker areas such as training, technical support, information accuracy and e-commerce procedures. Policymakers and extension agencies can strengthen digital literacy programmes and expand rural connectivity to reach more farmers. Since satisfaction does not differ significantly by age or gender, services can be designed for all farmers without focusing on one group, and efforts should concentrate on service quality and access. E-commerce platforms can build trust through transparent pricing; secure payments and quick grievance handling. Finally, the study offers a basis for further research on adoption, farm income and the continued use of digital agricultural services.

SUGGESTIONS

1. **Strengthen digital literacy.** Conduct regular hands-on training in village-level centres, ideally in the local language and through trusted farmer groups.
2. **Improve the timeliness and local relevance of information.** Provide advisories matched to the crop stage, location and weather, and use voice and video formats for farmers with limited literacy.
3. **Build trust in e-commerce.** Ensure transparent pricing, secure and simple payments, quick payment settlement, and a clear grievance mechanism.
4. **Improve logistics and market linkages.** Support collection points, cold storage and delivery partners so that farmers can sell and buy online without delays.
5. **Provide technical and after-sales support.** Offer helplines and field demonstrations for equipment and technology.
6. **Improve connectivity.** Expand reliable internet access in rural areas, which underpins every digital service.
7. **Collect farmer feedback regularly.** Providers and agencies should use periodic satisfaction surveys to refine services.

LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The study is limited to [study area] and to a sample of [number] farmers, so results may not apply to other regions. Responses depend on self-reported perceptions. Future studies may compare regions, examine specific crops, use longitudinal data to track changes in satisfaction, or study the effect of satisfaction on continued use and farm income.

CONCLUSION

Agricultural technology, information and e-commerce services can improve farm productivity, decision-making and income, but only when farmers find them accessible, reliable and trustworthy. This study shows that most farmers are moderately or highly satisfied with these services, and that satisfaction is shaped mainly by the quality of the service itself. All six factors examined, namely quality and reliability of information, cost and economic benefit, technical support and training, trust and security, delivery and market linkage, and digital literacy and awareness, were found to have a significant influence, with information quality ranking highest.. Service providers should therefore focus on improving service quality rather than targeting particular groups. Closing the gaps in digital literacy, timely information, market linkage and technical support will make these services more useful, build farmers' trust and help them benefit fully from digital agriculture. With

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sustained effort from government agencies, agri-technology firms and e-commerce platforms, these services can become a dependable part of everyday farming and contribute to stronger rural livelihoods.

REFERENCES

1. Su, L.; Peng, Y. Assessment and Driving Factors of Farmers' Practical Participation under the Perspective of Digital Rural Construction. J. Huazhong Agric. Univ. (Soc. Sci. Ed.) **2021**, 168–179, 199–200.
2. Lu, S.; Zhuang, J.; Sun, Z.; Huang, M. How can rural digitalization improve agricultural green total factor productivity: Empirical evidence from counties in China. Heliyon **2024**, 10, e35296.
3. Wang, X.; Cui, B. Analysis of Farmers' Cooperatives' E-commerce Adoption Behavior: Based on an Integrated Technology Adoption Model. Res. Agric. Mod. **2023**, 44, 316–327.
4. Song, Y.; Cai, F.; Zhang, C. Study on Farmers' Satisfaction with Participation in Agricultural E-commerce under the Background of Rural Revitalization Strategy: Based on the Dual Perspective of Purpose and Process. Chongqing Soc. Sci. **2021**, 104–119.
5. Jiang, J.; Qing, P.; Cai, W.; Huang, F. How Do Digital Skills Affect Farmers' E-commerce Participation? An Analysis Based on the Mediating Effect of Information Acquisition. J. China Agric. Univ. **2024**, 29, 81–93.
6. Lü, D.; Wang, Y. Promoting the Deep Development of Agricultural E-commerce: Policy Reflections Based on the Current Situation in Hubei Province. Commer. Econ. Res. **2018**, 10, 125–128.
7. Ndege, N.; Marshall, F.; Byrne, R. Exploring inclusive innovation: A case study in operationalizing inclusivity in digital agricultural innovations in Kenya. Agric. Syst. **2024**, 219, 104033.
8. Bolfe, É.L.; Jorge, L.A.d.C.; Sanches, I.D.A.; Luchiari Júnior, A.; da Costa, C.C.; Victoria, D.d.C.; Inamasu, R.Y.; Grego, C.R.; Ferreira, V.R.; Ramirez, A.R. Precision and digital agriculture: Adoption of technologies and perception of Brazilian farmers. Agriculture **2020**, 10, 653.
9. Da Silveira, F.; Lermen, F.H.; Amaral, F.G. An overview of agriculture 4.0 development: Systematic review of descriptions, technologies, barriers, advantages, and disadvantages. Comput. Electron. Agric. **2021**, 189, 106405.
10. Drewry, J.L.; Shutske, J.M.; Trechter, D.; Luck, B.D.; Pitman, L. Assessment of digital technology adoption and access barriers among crop, dairy and livestock producers in Wisconsin. Comput. Electron. Agric. **2019**, 165, 104960.
11. Geng, W.; Liu, L.; Zhao, J.; Kang, X.; Wang, W. Digital Technologies Adoption and Economic Benefits in Agriculture: A Mixed-Methods Approach. Sustainability **2024**, 16, 4431
12. He, C., Hao, H., Su, Y., & Yang, J. (2024). A Study on Factors Influencing Farmers' Adoption of E-Commerce for Agricultural Products: A Case Study of Wuchang City. Sustainability, 16(21), 9496
13. Jiang, A.; Yang, Z. The Behavioral Logic of Small Farmers from the Perspective of Cognitive Rationality. J. South China Agric. Univ. (Soc. Sci. Ed.) **2021**, 20, 54–65.
14. Peng, J.; Zhao, Z.; Liu, D. Impact of agricultural mechanization on agricultural production, income, and mechanism: Evidence from Hubei province, China. Front. Environ. Sci. **2022**, 10, 838686.
15. Shang, L.; Heckelei, T.; Gerullis, M.K.; Börner, J.; Rasch, S. Adoption and diffusion of digital farming technologies-integrating farm-level evidence and system interaction. Agric. Syst. **2021**, 190, 103074.

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