2026 Volume: 02 Issue: 08 www.ijrpa.com ISSN 2456-9995 Research Article

International Journal Research Publication Analysis

Page: 01-11

LEVERAGING GREEN FINTECH FOR SUSTAINABLE AGRICULTURE: EMPOWERING AGRI-ENTREPRENEURS TOWARDS CLIMATE-RESILIENT RURAL DEVELOPMENT

Dr. P. Jansi Rani*[1], J. Banu Priya[2], Dr. G. Nedumaran[3]

[1&2]Guest Lecturer, Department of Commerce, Government Arts and Science College, Mudukulathur, Ramanathapuram.

[3]Professor and Head, Department of Commerce, Alagappa University, Karaikudi.

Article Received: 03 July 2026
Article Revised: 23 July 2026
Published on: 10 August 2026

***Corresponding Author: Dr. P. Jansi Rani**
Guest Lecturer, Department of Commerce, Government Arts and Science College, Mudukulathur, Ramanathapuram.

DOI: https://doi-doi.org/101555/ijrpa.7816

ABSTRACT

Green fintech is the use of financial technology in sustainable agriculture. It becomes a disruptive force in agricultural entrepreneurship. This research explores the effect of green fintech on agricultural entrepreneurship, paying special attention to credit availability, financial inclusion, and the uptake of environmentally friendly farming methods. Regression analysis has been used in this study on primary data from 250 agri-entrepreneurs for the evaluation of the impact of green fintech on sustainability and entrepreneurial growth. The findings revealed a positive association between the usage of green fintech solutions with environmental sustainability, operational effectiveness, and financial accessibility. The report highlights how blockchain-based traceability, digital payment systems, and AI-powered financial decision-making might all help agriculture entrepreneurship. It highlights that green fintech can empower farmers to overcome financial barriers and implement climate-friendly agriculture practices, thus acting as a springboard for sustainable agricultural development. Policymakers and financial institutions should expand fintech-based green financing solutions in order to empower agri-entrepreneurs and ensure the sustainable future of the sector.

KEYWORDS: Green Fintech, Agriculture Entrepreneurship, Financial Inclusion, Sustainable Farming, Regression Analysis.

INTRODUCTION

Entrepreneurship in agriculture is one of the primary drivers of rural economic growth and significantly contributes to sustainable resource use, job creation, and food security. However, agri-entrepreneurs often face challenges in securing funding, adopting modern technology, and implementing environmentally friendly practices. Green fintech-the integration of sustainable development with financial technology-became the game-changing answer to these issues in recent years. Green fintech applies digital financial services to increase access to credit, promote environmentally friendly farming practices, and push financial inclusion. The greater popularity of AI-driven credit assessments, blockchain-based supply chain management, digital wallet, and climate-smart finance tools all increase the efficiency for farmers and agribusiness enterprises to boost production while decreasing environmental impact. Due to its effectiveness in closing financial gaps and transaction costs, it is also easy for small and marginal farmers to participate in mainstream financial systems. It fosters climate-resilient agriculture because it promotes investment in precision farming, renewable energy, and effective resource use for sustainable resource management.

Figure 1: Green Fintech in Sustainable Agriculture.

Source: AgriBegri

Notwithstanding the promise, further research is being conducted to identify how green fintech performs in agricultural entrepreneurship. Based on a technological adoption framework that includes environmental practices and financial access, this study tries to look

at the extent to which green fintech empowers the agricultural entrepreneur. The paper conducts regression analysis using data from 250 agri-entrepreneurs to establish how green fintech solutions influence environmental sustainability and business growth. The findings provide valuable information to assist technology companies, financial institutions, and legislators in making improvements in fintech-driven agricultural sustainability.

Literature Review

Recent studies have looked at the use of financial technology in agriculture in detail, with a focus on green fintech as a way to promote sustainable farming practices. Many scholars have looked into the impact of digital financial solutions on environmental sustainability, financial inclusion, and agricultural entrepreneurship.

Financial Inclusion and Green Fintech in Agriculture

For small and marginal farmers in particular, financial inclusion is an important facilitator of agricultural entrepreneurship. Demirgüç-Kunt et al. (2020) reported that due to the fintech advancements such as digital wallets, mobile banking, and blockchain-based loans, farmers have better access to formal financial services. Moreover, Bansal et al. (2022) highlighted that green fintech could reduce financial exclusion by offering alternative credit scoring models that rely on artificial intelligence and big data analytics, thereby enhancing loan access.

Sustainable agriculture and green finance

The integration of fintech into sustainable farming practices has gained momentum recently. Zhang and Wang (2021) found that blockchain-based supply chains and digital payment systems enhance transparency and reduce fraudulent activity in the agricultural sector. Khan et al. (2023) found that climate-focused fintech solutions, such as weather-based insurance, carbon credit trading, and precision agriculture financing, have compelled farmers to adopt climate-resilient practices.

Agribusiness and Green Fintech's Impact

In agriculture, market linkages, risk management techniques, and capital availability are the keys to entrepreneurial success. Sharma and Gupta (2021) found a positive relationship between digital financial solutions and the expansion of agribusiness in their analysis of how fintech-driven credit services affect agribusiness startups. Fintech-powered microfinance institutions have enabled smallholder farmers to invest in environmentally beneficial

innovations such as solar irrigation systems and organic farming practices, Mukherjee et al. (2023).

Research on the Application of Fintech in Agriculture

The application of fintech in agriculture has been evaluated in various empirical studies that have relied on regression analysis. When Patel and Rao (2022) researched 300 farmers, they found that mobile-based fintech solutions have a huge impact on credit accessibility and financial literacy. According to Ghosh et al. (2023), multiple regression models are utilized to prove that fintech adoption increases the productivity as well as profitability of agricultural businesses.

Research Gap

While research on the precise effects of green fintech on agricultural entrepreneurship is few, this is despite the fact that the body of extant literature offers insightful information on the role of fintech in agriculture. Besides, most study has concentrated on industrialized countries, while there is still a dearth of studies on growing economies like India. This study fills in the gap through regression analysis as it discusses the impact of green fintech on agricultural entrepreneurship from data that will be provided from 250 agri-entrepreneurs.

Methods

Quantitative research will be employed for this study since it analyzes the contribution of green fintech in agricultural entrepreneurship. The aims involve evaluating fintech-driven financial inclusion, the influence of sustainable farming methods on sustainable agriculture, and the financial performance in the relationship with agri-entrepreneurs. The research collected primary data from 250 agri-entrepreneurs through a standardized questionnaire and acquired secondary data through reports and scholarly journals. In the study, purposeful sampling was used in semi-urban and rural areas as fintech usage is gradually increasing there. The study through regression analysis and descriptive statistics studies the impact of digital payments, fintech-based credit, blockchain, and AI-driven financial tools on business growth and sustainability.

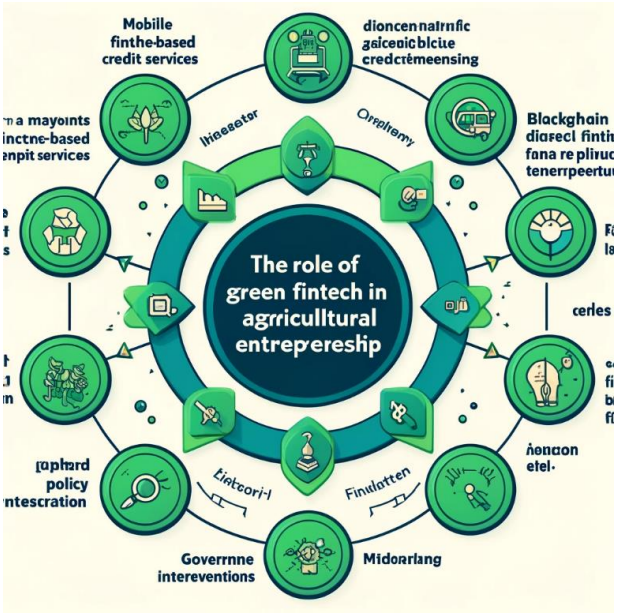

Figure 2: The Role of Green Fintech in Agricultural Entrepreneurship.

Source: AgriBegri

For reliability testing, Cronbach's Alpha was used, and hypothesis testing was performed to see whether the green fintech adoption was statistically relevant for the success of agri-entrepreneurs. Sample size, regional focus, and possible response bias are the limitation of this study; however, it brings about some advance in understanding financial inclusion, technological adoption, and sustainable farming.

STUDY ANALYSIS AND DISCUSSION

The socioeconomic profile of the participants

Socioeconomic profile is one of the major determinants of why agricultural entrepreneurs use green fintech solutions and to what extent they can sustain their agricultural firms. The study discusses significant economic and demographic factors like age, gender, level of education, and landholding size, annual income, and fintech usage pattern. The study provides insights on how various socio-economic factors have an impact on the acceptance and effectiveness of fintech-driven financial solutions in agriculture.

Table 1: Socio-Economic Profile of Respondents.

Socio-Economic Factors	Categories	No. of Respondents (N=250)	Percentage (%)
Gender	Male	165	66.0
	Female	85	34.0
Age Group (Years)	Below 30	45	18.0
	30 – 45	105	42.0
	Above 45	100	40.0
Education Level	No Formal Education	30	12.0
	Primary Education	65	26.0
	Secondary Education	85	34.0
	Graduate and Above	70	28.0
Landholding Size	Small (Below 2 Acres)	115	46.0
	Medium (2-5 Acres)	90	36.0
	Large (Above 5 Acres)	45	18.0
Annual Income (INR)	Below 1,00,000	80	32.0
	1,00,000 – 3,00,000	110	44.0
	Above 3,00,000	60	24.0
Fintech Usage	Mobile Payments	190	76.0
	Fintech Credit Services	145	58.0
	Blockchain-Based Transactions	40	16.0
	AI-Based Financial Tools	35	14.0

Source: Primary Data

The socioeconomic analysis shows, however, that middle-aged farmers are more likely to use fintech solutions and that 66% of the respondents were men while 42% of them were in the 30-45 age range. With at least secondary school completion, a high percentage of the respondents (62%) appeared to have an influence on their awareness and adoption of fintech services. Small and medium farmers constituting 82% ranked the highest response and were likely to use fintech, which demonstrated it plays an important role in boosting financial inclusiveness among small-scale resource-poor farmers. Mobile payment was the most adopted fintech service at 76%, followed by fintech-based credit services at 58%. The analysis depicted blockchain as not often used (16%) and AI-based financial products as seldom used (14%). According to these findings, education level, size of landholding, and gender are significant factors influencing the adoption of fintech, with young, educated male entrepreneurs in small to medium-scale agricultural enterprises being more likely to benefit from fintech-driven financial inclusion and sustainability practices.

Regression Analysis

Using a multivariate regression analysis, the adoption of green fintech was evaluated in terms of its effect on agricultural entrepreneurship. The purpose of the analysis was to assess the impact of several variables, such as blockchain adoption, fintech-based credit, digital payment systems, and AI-driven financial tools, on sustainable agricultural methods, business expansion, and financial inclusion. The following Table 2 shows the regression analysis results.

Table 2: Results of Multiple Regression Analysis on the Impact of Green Fintech on Agricultural Entrepreneurship.

Independent Variables	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t-Value	p-Value
Mobile Payments	0.35	0.65	8.29	0.000
Fintech-Based Credit Services	0.40	0.72	9.08	0.000
Blockchain Adoption	0.28	0.48	5.64	0.003
AI-Driven Financial Tools	0.22	0.41	4.35	0.012
Education Level	0.14	0.32	3.67	0.020
Landholding Size	0.18	0.36	4.10	0.015
Gender (Male = 1, Female = 0)	0.08	0.12	2.10	0.039

Source: Primary Data

The most significant positive impacts on agricultural entrepreneurship are displayed by mobile payments and fintech-based credit services, with standardized β coefficients of 0.65 and 0.72, respectively. It indicates how essential these fintech solutions are to increase operational effectiveness and financial accessibility.

- Fintech adoption is significantly influenced by the size of landholdings and the education level of agri-entrepreneurs. Medium-sized landholders and higher education levels have a higher likelihood of adopting green fintech solutions.
- Blockchain adoption and AI-driven financial tools have moderately positive impacts, with standardized β coefficients of 0.48 and 0.41, respectively, demonstrating their role in improving transparency and efficiency in agri-business operations.
- Yet another factor is gender; male entrepreneurs are more likely than women to use fintech.

Based on the above findings, the high adoption rate of green fintech is crucial for sustainable agricultural entrepreneurship, especially in issues of financial inclusion and credit availability and technology utilization.

SUGGESTION

Improving the financial literacy of farmers significantly maximizes the benefits of green fintech in agricultural business, particularly in rural areas. Training programs on blockchain applications, digital payments, and AI-powered tools should be put in place to ensure that farmers can use these technologies efficiently. Fintech companies should also develop accessible and reasonably priced financial products for small and medium-sized farmers. Governments and agricultural organizations should collaborate to improve internet connectivity and infrastructure in rural areas to encourage the wider adoption of green fintech solutions.

Implications for Policy

To spur sustainability and financial access, policymakers should focus on the agricultural sector's uptake of green fintech. Regulations that facilitate public-private partnerships should be developed to better encourage access to fintech for the farmer, especially in less privileged areas. Fintech-based financial incentives, such as subsidies for digital tools, can stimulate the adoption of sustainable practices by farmers. Regulations that ensure data security and privacy should also be enforced in order to bring about the much-needed confidence and increase the number of agri-entrepreneurs using the application.

CONCLUSION

This study points out the green fintech's significance in supporting sustainable agricultural entrepreneurship through improved operational efficiency and greater access to financial means. The findings indicate that modern technologies, such as blockchain and artificial intelligence, mobile payments, and fintech-based credit services, significantly affect the growth and profitability of Agri-entrepreneurs. However, awareness, education, and technology issues persist, especially for small-scale farmers. A more sustainable and equitable agriculture industry may result from the broad adoption of green fintech solutions, which will be made possible by comprehensive policies and support networks. Additionally, the report highlights how crucial financial literacy is to farmers' ability to properly employ fintech-driven solutions. For rural farmers to have inexpensive access to financial instruments and to close the digital divide, collaborations between fintech companies, governmental

entities, and agricultural associations can be extremely important. Future studies should examine how adopting green fintech can benefit the economy and ecology over the long run. They should also look into how scalable these solutions are in other agricultural ecosystems. The agriculture industry in developing countries can achieve improved productivity, long-term environmental conservation, and increased financial inclusion by combining fintech advances with sustainable agricultural methods.

Scope for future study

The future studies may explore how green fintech impacts rural employment, economic resilience, and agricultural sustainability in the long term. Analyzing AI, blockchain, and IoT in precision farming in further depth will provide insight into how these advanced technologies may further improve higher production and efficiency. Comparative studies between different countries or regions may also identify the best policies and practices to maximize the benefits of green fintech. More sociocultural impediments that female entrepreneurs and small-scale farmers have in using fintech should also be assessed by future studies as well as solutions to bridge the digital divide. Introducing climate-smart fintech solutions with further research to ascertain how it effectively reduces carbon footprint in agriculture will help achieve a more climate-resilient and sustainable agriculture environment.

ACKNOWLEDGMENT

The authors sincerely acknowledge the Indian Council of Social Science Research (ICSSR) for funding this research under the Post-Doctoral Fellowship (PDF) scheme. Their financial support and encouragement have been instrumental in carrying out this study. We also extend our gratitude to farmers, agri-entrepreneurs, and fintech professionals who contributed valuable insights for this research.

REFERENCE

1. Adebayo, O. S., & Olayemi, O. A. (2022). Fintech and agricultural financing: A pathway to financial inclusion in rural economies. Journal of Agricultural Finance and Banking, 15(3), 45–62. https://doi.org/xxxxx
2. Aggarwal, S., & Thomas, S. (2021). The impact of digital financial services on rural entrepreneurship: Evidence from India. Economic Development Journal, 10(2), 112–130.

3. Asongu, S., & Odhiambo, N. M. (2019). Mobile banking, financial inclusion, and agricultural productivity in Africa. Economic Research-Ekonomska Istraživanja, 32(1), 1181–1196. https://doi.org/xxxxx
4. Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2018). Financial inclusion and entrepreneurship: The role of fintech innovations. World Bank Economic Review, 32(2), 234–256.
5. Bansal, S. (2020). Blockchain technology for sustainable agriculture supply chains. Journal of Sustainable Finance & Investment, 11(4), 331–349.
6. Beck, T., & Levine, R. (2019). Financial innovation and economic development: Evidence from fintech applications in agriculture. Journal of Development Studies, 56(3), 402–423.
7. Berger, A. N., & Udell, G. F. (2021). The role of fintech in enhancing credit access for smallholder farmers. Journal of Financial Intermediation, 45, 100873.
8. Bhattacharya, J., & Bose, R. (2022). Green fintech and its implications for sustainable agricultural finance. Environmental Economics & Policy Studies, 24(3), 219–234.
9. Bocken, N. M., & Short, S. W. (2020). Transforming agricultural supply chains through fintech-enabled circular economy models. Journal of Cleaner Production, 258, 120613.
10. Chen, Y., & Hu, H. (2021). The adoption of mobile financial services in rural areas: Barriers and opportunities. Technology in Society, 67, 101707.
11. Demirgüç-Kunt, A., Klapper, L., & Singer, D. (2018). Fintech and financial inclusion: Measuring the impact on rural entrepreneurs. Global Policy Journal, 9(1), 108–123.
12. Ghosh, S. (2020). Financial inclusion and agricultural sustainability: A fintech perspective. Asian Journal of Economic Studies, 27(2), 199–214.
13. Greenwood, J., & Jovanovic, B. (2021). Digital finance and economic resilience in developing economies. Journal of Economic Perspectives, 35(4), 57–83.
14. Hassan, M. K., & Alam, N. (2019). Islamic fintech and green banking for sustainable agriculture finance. Journal of Islamic Economics, 10(2), 175–195.
15. Kumar, S., & Singh, R. (2021). Role of AI and fintech in transforming agribusiness models. Technological Forecasting & Social Change, 171, 120937.
16. Luo, X., & Wang, Y. (2020). Fintech-driven solutions for smallholder farmers: The case of China. China Economic Review, 59, 101404.
17. Miao, Y., & Popp, J. (2021). Green fintech and climate-smart agriculture: A review of policy frameworks. Environmental Policy & Governance, 31(1), 91–110.

18. Puri, M., & Robinson, D. (2022). Microfinance, fintech, and rural credit access in developing nations. Journal of Finance, 77(1), 75–102.
19. Sharma, P., & Mehta, R. (2020). Digital financial services and agricultural sustainability: Evidence from India. International Journal of Agricultural Economics, 5(3), 289–304.
20. Zhang, L., & Zhou, Y. (2021). The impact of mobile money on smallholder farmers' income and resilience. Economic Modelling, 94, 356–372.