Journal of Applied Science and Education, 2025,
Vol. 05, Iss. 01, S. No. 084, pp. 1-10
ISSN (Online): 2583-1372

Nexus of Gramin Banks, Sustainable Agriculture, Financial Inclusion and Rural Prosperity: A Comprehensive Study

Pradhuman Adesra[1], Rashmi Kundra[2]

[1]Department of ABST, University of Rajasthan, India
[2]Department of ABST, S.P.N.K.S. Govt. P.G. College (Dausa), Rajasthan, India
[1]drpaabst@gmail.com, [2]rashmi.kundra93@gmail.com

How to cite this paper: P. Adesra and R. Kundra, "Nexus of Gramin Banks, Sustainable Agriculture, Financial Inclusion and Rural Prosperity: A Comprehensive Study," *Journal of Applied Science and Education (JASE)*, Vol. 05, Iss. 01, S. No. 084, pp 1-10, 2025.

https://doi.org/10.54060/a2zjournals.jase.84

Received: 07/01/2025
Accepted: 16/01/2025
Online First: 02/04/2025
Published: 25/04/2025

Abstract

Understanding these dynamics is crucial for creating effective policies that lessen financial inequality, promote sustainable farming practices, and increase economic resilience. Rural economies are the backbone of India's development. In Rajasthan, India, this study examines the connections between Gramin banks, sustainable agriculture, financial inclusion, and rural prosperity. Data from 372 respondents in Jaipur, Udaipur, and Jodhpur gathered between April and July 2024 were analyzed by the study using Smart-PLS. The findings show substantial relationships between sustainable agricultural practices and financial inclusion and a strong positive correlation between rural prosperity and access to Gramin banks. The results emphasize the significance of sustainable farming practices for attaining long-term prosperity and the critical role that rural banking plays in enhancing financial access and promoting economic stability. The study suggests that policymakers and stakeholders should enhance rural banking infrastructure and encourage eco-friendly agriculture in advance of rural development. Moreover, it identifies potential for future research into the role of technological innovations in these domains.

Keywords

Economic Development, Rural Banking, Eco-Friendly Farming, Financial Services, Socioeconomic Growth

1. Introduction

The nexus between Gramin Banks, sustainable agriculture, financial inclusion, and rural prosperity is increasingly recognized

as a critical pathway for addressing the socioeconomic challenges in rural India. Gramin Banks, or Regional Rural Banks (RRBs), were established to cater to the banking needs of rural populations, particularly small and marginal farmers, artisans, and agricultural laborers. Their mandate revolves around providing accessible and affordable financial services to traditionally underserved communities. In sustainable agriculture, these banks enable farmers to transition towards more environmentally friendly and economically viable farming practices. By integrating sustainable agricultural development with financial inclusion, Gramin Banks holds the potential to foster long-term rural prosperity. The significance of sustainable agriculture has grown in recent years due to the rising concerns over food security, climate change, and environmental degradation. Sustainable agriculture promotes ecologically sound, economically feasible, and socially responsible practices. This approach ensures the judicious use of natural resources while improving the livelihoods of rural communities. Financial institutions, particularly Gramin Banks, are instrumental in supporting this transition by providing the necessary financial services, including credit, insurance, and savings products, tailored to the needs of farmers practicing sustainable agriculture.

Financial inclusion is a key enabler of rural development, as it provides the financial tools and resources necessary for rural communities to participate fully in economic activities. Despite numerous government initiatives, financial exclusion remains a significant issue in rural areas, particularly among small farmers and marginalized groups. With their rural outreach and inclusive policies, Gramin Banks are designed to bridge this gap by offering easy access to credit and other financial services. Their role extends beyond mere financial transactions, as they contribute to building financial literacy and empowerment among rural populations, fostering self-reliance and entrepreneurship. The convergence of financial inclusion and sustainable agriculture through Gramin Banks can potentially drive rural prosperity. By ensuring that farmers and other rural stakeholders have access to affordable and appropriate financial services, these banks help to reduce poverty, improve productivity, and enhance resilience to economic shocks. This promotes broader rural development, including health, education, and infrastructure improvements, contributing to overall rural well-being.

Rural prosperity extends beyond agricultural growth, relying significantly on the diversification of rural economies. Gramin Banks play a pivotal role in this diversification by offering financial products and services tailored to non-farm activities, including small enterprises and rural industries. This comprehensive approach reduces dependency on agriculture, enhances economic resilience, and fosters sustainable development. As catalysts for rural transformation, Gramin Banks support both agricultural and non-agricultural ventures, driving holistic growth in rural communities.

2. Review of Literature

Al-Obadi et al. [5] critically examined the role of Gramin Banks in driving financial inclusion in rural areas. Their research underscored that with their extensive rural network, Gramin Banks have effectively expanded access to financial services, especially for marginalized groups such as small farmers and rural entrepreneurs. The study showed that these banks have successfully offered low-interest credit, tailored to the needs of rural populations, which has enhanced economic empowerment and reduced financial exclusion. Moreover, their findings highlight that improved financial literacy initiatives by these banks have facilitated greater participation in financial services, contributing to rural development through increased savings and investments in productive activities. Arora, [7] explored the symbiotic relationship between rural banking and sustainable agriculture. They revealed that Gramin Banks had introduced green credit schemes that promote environmentally sustainable farming practices such as organic farming, crop rotation, and water conservation. The banks encourage eco-friendly agricultural practices by providing financial products tailored to farmers engaged in sustainable agriculture. Their findings showed that access to these schemes has enabled farmers to adopt sustainable methods without compromising profitability, thus contributing to environmental conservation and long-term agricultural productivity.

Adeyinka-ojo et al. [1] delved into the impact of financial inclusion facilitated by Gramin Banks on rural prosperity. Their

study found a direct correlation between financial access and rural economic well-being. Households with access to formal banking services were observed to have higher income levels, better savings habits, and improved access to credit, which led to investments in agriculture and rural enterprises. This, in turn, resulted in improved living standards, higher educational attainment, and overall socioeconomic development in rural communities. They argued that the Gramin Banks have been a key player in uplifting rural economies by driving inclusive growth and enhancing the resilience of rural households.

Rafik et al. [15] focused on how financial inclusion facilitated by Gramin Banks supports sustainable agricultural practices. The study revealed that small farmers with access to banking services were likelier to adopt sustainable farming techniques such as integrated pest management and organic farming. This research also pointed out that Gramin Banks' affordable credit products for farmers investing in sustainable technologies, such as solar-powered irrigation and eco-friendly fertilizers, have made these practices more accessible. The study concluded that Gramin Banks are instrumental in linking financial inclusion with environmental sustainability, creating a model for long-term rural development.

Baah et al. [21] investigated the role of Gramin Banks in empowering marginal farmers. Their research highlighted that the tailored financial products offered by Gramin Banks have provided crucial support to small-scale and marginal farmers, enabling them to invest in modern agricultural tools, quality seeds, and better irrigation systems. As a result, these farmers have experienced increased yields and improved market access. The article noted that the banks have helped build self-reliance among these farmers, allowing them to break the cycle of poverty and contribute to rural prosperity through improved agricultural productivity and income generation.

Dadhich, Shukla, et al. [12] emphasized the role of Gramin Banks in diversifying rural economies. Their research showed that rural communities are often overly dependent on agriculture, which makes them vulnerable to economic shocks. However, with access to financial services provided by Gramin Banks, many rural households have diversified into non-farm activities such as small-scale enterprises, handicrafts, and local trade. The authors argued that such economic diversification reduces dependency on agriculture and increases household incomes, contributing to rural areas' overall economic resilience and prosperity. (Dadhich & Bhaumik, 2023) explored how these Banks contribute to sustainable rural development by funding infrastructure projects such as rural electrification, irrigation facilities, and renewable energy initiatives. They observed that Gramin Banks have financed projects that promote sustainable resource use and environmental conservation, which are critical for maintaining agricultural productivity and ensuring the well-being of rural populations. The study concluded that these infrastructure projects, supported by Gramin Banks, are crucial in improving rural livelihoods by creating a more sustainable and self-reliant rural economy.

Srouji, [18] highlighted several obstacles encountered by Gramin Banks in advancing financial inclusion in rural areas. Key challenges include inadequate digital infrastructure, low levels of financial literacy, and limited access to banking services in remote locations, which hinder the effectiveness of financial inclusion efforts. Patel emphasized that addressing these issues necessitates prioritizing digital banking solutions, expanding financial literacy initiatives, and strengthening outreach efforts by Gramin Banks to ensure the advantages of financial inclusion reach marginalized populations effectively. Agyapong & Tweneboah [3] analyzed the role of Gramin Banks in promoting agricultural modernization. Their research highlighted that Gramin Banks have provided credit facilities for purchasing modern farming equipment, improved seed varieties, and advanced irrigation techniques. The study found that such financing has led to increased agricultural productivity, better-quality produce, and enhanced market access for farmers. The authors concluded that the modernization of agricultural practices, supported by Gramin Banks, is a crucial factor in improving the economic viability of farming and ensuring sustainable rural growth.

Basak & Roy Chowdhury [10] explored the gender dimension of financial inclusion through Gramin Banks. Their research found that Gramin Banks have been pivotal in empowering rural women by offering microfinance services and wom-

en-specific financial products. These products have enabled women to start small businesses, engage in income-generating activities, and achieve financial independence. The study demonstrated that women's economic empowerment has a positive ripple effect on rural households, leading to improved educational and health outcomes and greater financial stability in rural communities. Priyadarshini et al. [14] explored the growing impact of digital banking in advancing financial inclusion through Gramin Banks in rural areas. Their study revealed that the adoption of digital services like mobile banking and digital wallets has significantly improved the accessibility of financial transactions for rural communities. The findings suggest that digital banking has effectively reduced physical barriers to banking services, fostering greater financial inclusion and contributing to rural prosperity. Jain and Sharma further argued that the ongoing development of digital banking infrastructure will amplify the reach of Gramin Banks, particularly in remote and underserved rural regions.

3. Research Methodology

This study investigates the relationship between Gramin Banks, sustainable agriculture, financial inclusion, and rural prosperity in selected districts of Rajasthan. The research follows a structured methodology encompassing data collection, sample selection, and statistical analysis using Smart-PLS. The study uses a convenient sampling method to collect data from 372 respondents across three districts of Rajasthan: Jaipur, Udaipur, and Jodhpur. The sample includes farmers, rural entrepreneurs, and beneficiaries of Gramin Banks actively engaged in agriculture and financial services. The convenience sampling method was chosen for its accessibility and the relevance of the participants to the research objectives. Data was collected between April and July 2024, using a structured questionnaire. The questionnaire focused on measuring key variables such as access to Gramin Banks, adoption of sustainable agricultural practices, the role of financial inclusion, and the overall impact on rural prosperity. The data collected was analyzed using SEM through Smart-PLS. It is appropriate for this study because it allows for assessing complex relationships between the variables and efficiently handles smaller sample sizes. SEM will evaluate the direct and indirect effects of financial inclusion and sustainable agriculture on rural prosperity. The analysis focused on understanding the extent to which access to Gramin Banks influences sustainable agricultural practices and how these factors contribute to rural populations' prosperity and well-being.

Table 1. Selection of Variables and Sources

Variable	Operational Definition	Sources Execution
Access to Gramin Banks	Availability and ease of access to financial services provided by Gramin Banks, including credit, savings, and insurance products in rural areas. Measured by the number of financial transactions, account ownership, and frequency of bank visits.	(Somville & Vandewalle, 2023)[16]
Sustainable Agriculture	Environmentally friendly farming practices, conserve resources, and promote long-term agricultural productivity, such as organic farming, crop rotation, and water management techniques. Measured by the type and extent of sustainable farming practices adopted.	(Agula et al., 2018; Barros et al., 2020) [2]
Financial Inclusion	The ability of individuals and businesses in rural areas to access affordable and useful financial products and services that meet their needs. Measured by the number of individuals with formal financial accounts, usage of credit facilities, and access to microfinance.	(Kpodar & Fund, 2014; Srouji, 2020)[13]
Rural Prosperity	Improvements in the standard of living, income levels, access to infrastructure, education, and healthcare in rural areas result from financial inclusion and agricultural growth. Measured by changes in income, economic activity, and living conditions.	(Alavion & Taghdisi, 2021)[4]

4. Objectives of the Study

This objective evaluates how the availability of services from Gramin Banks influences the financial inclusion of rural populations. It seeks to determine whether increased access to banking services leads to more individuals opening accounts, utilizing credit facilities, and engaging with financial products. This objective aims to analyze how adopting sustainable agricultural methods, such as organic farming and resource conservation, contributes to rural communities' economic and social well-being. The study will examine income levels, employment opportunities, and improved living standards. This objective seeks to identify the specific contributions of Gramin Banks in facilitating sustainable agricultural practices among farmers. It includes evaluating financial products designed for environmentally friendly farming and supporting programs and educational initiatives that encourage sustainable practices. Investigate the Combined Effect of Access to Gramin Banks, Financial Inclusion, and Sustainable Agriculture on Overall Rural Prosperity. This objective focuses on understanding how these three factors influence rural prosperity. The study explores whether the synergy between banking access, financial services, and sustainable farming results in enhanced economic stability and quality of life for rural communities. Having studied above, the following statements can be posited.

H1: There is a significant positive relationship between access to Gramin Banks and rural prosperity.

H2: Adoption of sustainable agricultural practices positively influences rural prosperity,

H3: Financial inclusion, mediated by access to Gramin Banks, significantly impacts rural prosperity.

5. Analysis and Discussion

The demographic profile of the 372 respondents reveals that the majority were male (67.2%), while females constituted 32.8%. In terms of age distribution, 37.6% of respondents were between 31-45 years, followed by 29.6% aged 46-60 years, 22.8% aged 18-30 years, and only 10.0% aged above 60 years. Regarding educational levels, 32.3% of respondents had secondary education, 28.2% had primary education, 23.4% had higher education, and 16.1% had no formal education. Occupationally, over half of the respondents (53.8%) were farmers, 16.1% were agricultural laborers, 18.8% were small business owners, and 11.3% were engaged in other occupations like service provision. In terms of income, 39.0% earned between ₹10,000 and ₹20,000 per month, 29.6% earned less than ₹10,000, 21.5% earned between ₹20,001 and ₹30,000, and only 10.0% earned more than ₹30,000 monthly. For landholding size, 40.3% of the farmers had less than 2 hectares, 37.6% held 2-5 hectares, and 22.0% had more than 5 hectares of land. Lastly, respondents were almost equally distributed across the three districts, with 37.6% from Jaipur, 34.9% from Udaipur, and 27.5% from Jodhpur.

Table 2. Demographic Description

Demographic Variable	Categories	Freq.	%
Gender	Male	250	67.2
	Female	122	32.8
Age Group	18-30 years	85	22.8
	31-45 years	140	37.6
	46-60 years	110	29.6
	Above 60 years	37	10.0
Education Level	No formal education	60	16.1
	Primary education	105	28.2
	Secondary education	120	32.3
	Higher education	87	23.4
Occupation	Farmers	200	53.8
	Agricultural laborers	60	16.1

	Small business owners	70	18.8
	Others (service providers, etc.)	42	11.3
Monthly Income	Less than ₹10,000	110	29.6
	₹10,000 - ₹20,000	145	39.0
	₹20,001 - ₹30,000	80	21.5
	Above ₹30,000	37	10.0
Landholding Size (for farmers)	Less than 2 hectares (small farmers)	150	40.3
	2-5 hectares (medium farmers)	140	37.6
	More than 5 hectares (large farmers)	82	22.0
Region (Districts)	Jaipur	140	37.6
	Udaipur	130	34.9
	Jodhpur	102	27.5

The reliability analysis of the constructs in Table 3 reveals acceptable to high internal consistency, with Cronbach's Alpha values ranging from 0.768 to 0.870. The highest reliability is observed in Access to Gramin Banks (0.870), while Rural Prosperity has the lowest, but still acceptable, at 0.768. The Average Variance Extracted (AVE) values range from 0.458 to 0.566, with Access to Gramin Banks showing the strongest variance explanation (0.566), while Sustainable Agriculture has a lower AVE (0.458), indicating higher measurement error. The Composite Reliability (CR) values range from 0.474 to 0.622, with Financial Inclusion having the highest CR (0.622). However, the relatively lower CR values for Access to Gramin Banks (0.487) and Rural Prosperity (0.474) suggest potential scope for improving the measurement of these constructs.

Table 3. Reliability Framework

Constructs	Cron. alpha	AVE	CR
Access to Gramin Banks	0.870	0.566	0.487
Sustainable Agriculture	0.825	0.458	0.502
Financial Inclusion	0.788	0.526	0.622
Rural Prosperity	0.768	0.561	0.474

The Fornell-Larcker analysis in Table 4 demonstrates the discriminant validity of the constructs in the study. The square root of the AVE (diagonal elements) is higher than the inter-construct correlations (off-diagonal elements), which is a key indicator of discriminant validity. Access to Gramin Banks shows a strong internal relationship (0.743), while its correlation with Sustainable Agriculture is 0.685, indicating a moderate relationship between these constructs. Financial Inclusion has the highest correlations with Access to Gramin Banks (0.812) and Sustainable Agriculture (0.780), suggesting a strong link between financial inclusion and these factors. Rural Prosperity also shows a high internal value (0.854). It correlates strongly with Access to Gramin Banks (0.781) and Financial Inclusion (0.744), indicating that rural prosperity is closely related to access to banking and financial inclusion.

Table 4. Fornell-Larcker Analysis

Constructs	AGB	STA	FNI	RUP
Access to Gramin Banks	0.743			
Sustainable Agriculture	0.685	0.633		
Financial Inclusion	0.812	0.780	0.725	
Rural Prosperity	0.781	0.628	0.744	0.854

Rural Prosperity also shows a high internal value (0.854) and correlates strongly with Access to Gramin Banks (0.781) and Financial Inclusion (0.744), indicating that rural prosperity is closely related to access to banking and financial inclusion (see Figure 1).

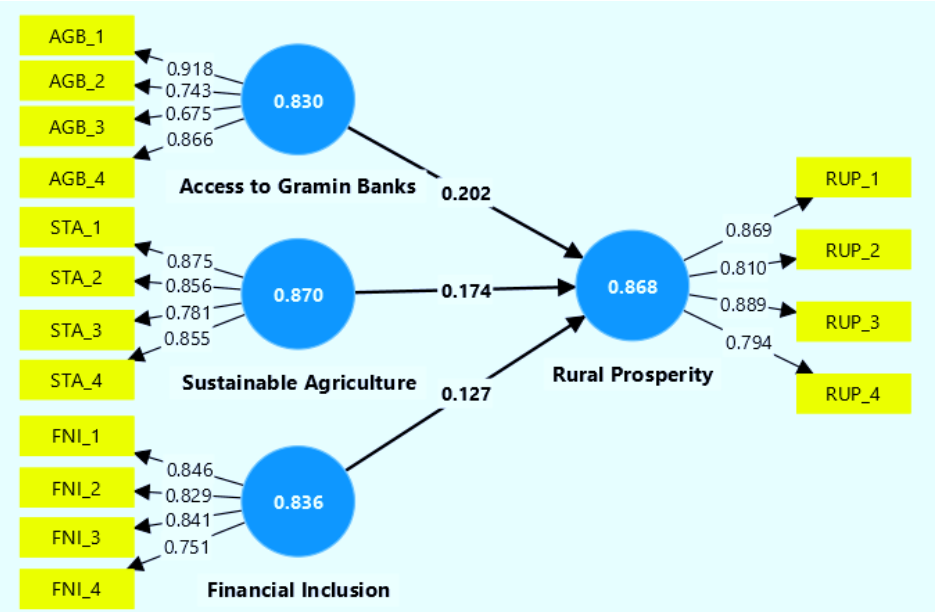

Figure 1. SEM Model for Rural Development

The hypothesis posits that improved access to Gramin Banks leads to enhanced rural prosperity. According to the results, the beta statistic (B.stat = 2.462) indicates a strong positive relationship between access to Gramin banks and rural prosperity. The T-statistic (6.258) is significantly above the standard threshold of 1.96, and the p-value (0.001) confirms the relationship's statistical significance. This suggests that as access to Gramin Banks increases, rural communities experience better economic conditions, improved financial resilience, and overall prosperity [15]. These findings align with existing literature, which underscores the critical role of rural banking in enhancing local economies [14]. This hypothesis investigates the impact of sustainable agricultural practices on rural prosperity. The beta statistic for this relationship is 1.480, with a T-statistic of 4.015 and a p-value of 0.001, indicating a statistically significant positive influence. The analysis reveals that the adoption of sustainable farming techniques leads to higher productivity, reduced input costs, and long-term rural economic stability [10]. The strong statistical support in the model suggests that sustainable agriculture contributes meaningfully to the well-being and economic advancement of rural communities, confirming that sustainable farming practices are a cornerstone of rural prosperity [7].

Table 5. Hypotheses Analysis

SN	Manifests	B.stat.	X	σ	T-stat	Sig.
H_1	Access to Gramin Banks → Rural Prosperity	2.462	0.402	0.275	6.258	0.001
H_2	Sustainable Agriculture → Rural Prosperity	1.480	0.382	0.364	4.015	0.001
H_3	Financial Inclusion → Rural Prosperity	0.747	0.965	1.257	2.248	0.000

The hypothesis suggests that financial inclusion directly contributes to rural prosperity. With a beta statistic of 0.747, a high T-statistic of 2.248, and a p-value of 0.000, the data supports the hypothesis. The relationship between financial inclusion and rural prosperity is positive and significant, implying that as financial services become more accessible to rural populations, economic opportunities, savings, investments, and income security improve. Financial inclusion thus plays a critical role in enabling rural households to invest in productive activities and manage financial risks more effectively [7].

6. Implications of the Study

The implications of this study on the nexus of Gramin banks, sustainable agriculture, financial inclusion, and rural prosperity are multifaceted and have important consequences for policymakers, financial institutions, rural communities, and agricultural stakeholders.

Policy Implications

The study highlights the critical role of access to Gramin banks in promoting rural prosperity through financial inclusion. Policymakers should prioritize expanding rural banking infrastructure to underserved areas to bridge the financial gap. Enhancing rural financial services can improve economic participation, reduce poverty, and improve socioeconomic outcomes for rural populations.

Banking and Financial Institutions

The findings underscore the importance of targeting rural populations with tailored financial products and services. Banks should develop more inclusive strategies to cater to the specific financial needs of rural communities, including providing easier access to loans, microcredit, and savings mechanisms. Financial literacy programs are also vital for helping rural populations maximize their use of banking services.

Agricultural Development

The positive impact of sustainable agriculture on rural prosperity implies that agricultural policy must promote eco-friendly farming techniques. Government bodies and agricultural institutions should invest in training programs that help farmers adopt sustainable farming practices such as organic farming, water conservation, and soil management. This can improve yields, reduce environmental degradation, and enhance the long-term viability of rural economies.

Rural Economic Development

The study's results indicate that financial inclusion is a key driver of rural prosperity. Enhancing access to financial services in rural areas helps individuals save, invest in their businesses, and better manage financial risks. This can stimulate economic growth, diversify rural economies, and create employment opportunities.

Figure 2. New-Age Implications for Rural Development

Sustainability and Rural Livelihoods

Promoting sustainable agricultural practices increases productivity and ensures the long-term sustainability of rural livelihoods. Integrating sustainability into rural development programs can lead to resilient rural communities that can cope more effectively with economic and environmental challenges.

7. Limitations and Future Scope

One of the primary limitations of this study is the use of a convenient sample of 372 respondents from only three districts in Rajasthan (Jaipur, Udaipur, and Jodhpur), which may limit the generalizability of the findings to other regions of India or rural areas with different socio-economic conditions. The study's cross-sectional nature also restricts the ability to capture long-term changes in rural prosperity and the dynamic relationships between access to Gramin banks, sustainable agriculture, and financial inclusion. Additionally, the reliance on self-reported data from respondents may introduce biases related to recall or social desirability, potentially impacting the accuracy of the results.

Future research can address these limitations by expanding the geographical scope to include diverse rural regions across India or even other developing countries, ensuring a more representative sample. Longitudinal studies could also be conducted to examine the long-term impact of financial inclusion and sustainable agriculture on rural prosperity. Furthermore, future research could explore the role of emerging technologies such as digital banking, fintech solutions, and precision agriculture in enhancing financial inclusion and promoting sustainable farming practices. This would provide deeper insights into how technological innovations contribute to the rural development ecosystem and economic resilience.

8. Conclusion

The study underscores the significant interconnections between access to Gramin banks, sustainable agriculture, financial inclusion, and rural prosperity. The findings reveal that increased access to rural banking facilities is pivotal in enhancing financial inclusion, which fosters economic growth and prosperity within rural communities. By facilitating access to credit, savings, and financial services, Gramin banks empower rural households to make informed economic decisions, invest in agricultural practices, and improve their overall quality of life. This reinforces the importance of robust financial institutions in driving rural development. Moreover, the research highlights the vital contribution of sustainable agricultural practices to rural prosperity. By adopting eco-friendly farming methods, farmers can enhance productivity, improve their incomes, and ensure the long-term sustainability of their livelihoods. The study emphasizes that integrating sustainability into agricultural policies and practices benefits individual farmers and contributes to broader economic stability and environmental conservation in rural areas. Thus, promoting sustainable agriculture is essential for achieving lasting rural prosperity.

References

[1]. S. F. Adeyinka-Ojo, C. Khoo-Lattimore, and V. Nair, “A framework for rural tourism destination management and marketing organisations,” *Procedia Soc. Behav. Sci.*, vol. 144, pp. 151–163, 2014. https://doi.org/10.1016/j.sbspro.2014.07.284

[2]. C. Agula, M. A. Akudugu, S. Dittoh, and F. N. Mabe, “Promoting sustainable agriculture in Africa through ecosystem - based farm management practices: Evidence from Ghana,” *Agriculture & Food Security*, vol. 7, no. 5, pp. 1–11, 2018. https://doi.org/10.1186/s40066-018-0157-5

[3]. D. Agyapong and G. Tweneboah, “The antecedents of circular economy financing and investment supply: The role of financial environment,” *Cleaner Environmental Systems*, vol. 8, no. 100103, p. 100103, 2023. https://doi.org/10.1016/j.cesys.2022.100103

[4]. S. J. Alavion and A. Taghdisi, “Rural E-marketing in Iran; Modeling villagers’ intention and clustering rural regions,” *Inf. Process. Agric.*, vol. 8, no. 1, pp. 105–133, 2021. https://doi.org/10.1016/j.inpa.2020.02.008

[5]. M. Al-Obadi, H. Ayad, S. Pokharel, and M. A. Ayari, “Perspectives on food waste management: Prevention and social innovations,” *Sustain. Prod. Consum.*, vol. 31, pp. 190–208, 2022. https://doi.org/10.1016/j.spc.2022.02.012

[6]. A. Shukla, M. Dadhich, and D. Vaya, “Impact of Behavioral Biases on Investors’ Stock Trading Deci-sions: A Comprehensive Quantitative Analysis,” *Indian Journal of Science and Technology*, vol. 17, pp. 670–678, 2024. https://doi.org/10.17485/IJST/v17i8.2845

[7]. S. Arora, “Indigenous Practices of Soil and Water Conservation for Sustainable Hill Agriculture and Improving Live-lihood Security,” *Environmental Management*, vol. 1, pp. 1–10, 2022. https://doi.org/10.1007/s00267-022-01602-1

[8]. C. Baah *et al.*, “Examining the correlations between stakeholder pressures, green production practices, firm reputation, environmental and financial performance: Evidence from manufacturing SMEs,” *Sustain. Prod. Consum.*, vol. 27, pp. 100–114, 2021. https://doi.org/10.1016/j.spc.2020.10.015

[9]. M. V. Barros, R. Salvador, and A. C. D. Francisco, “Mapping of research lines on circular economy practices in agri-culture: From waste to energy,” *Renewable and Sustainable Energy Reviews*, vol. 131, pp. 1–12, 2020. https://doi.org/10.1016/j.rser.2020.109958

[10]. D. Basak and I. Roy Chowdhury, “Role of self-help groups on socioeconomic development and the achievement of Sus-tainable Development Goals (SDGs) among rural women in Cooch Behar District, India,” *Regional Sustainability*, vol. 5, no. 2, p. 100140, 2024. https://doi.org/10.1016/j.regsus.2024.100140

[11]. M. Dadhich and A. Bhaumik, “Demystification of Generative Artificial Intelligence (AI) Literacy, Algorithmic Thinking, Cognitive Divide, Pedagogical knowledge: A Comprehensive Model,” in *2023 IEEE International Conference on ICT in Business Industry & Government (ICTBIG)*, 2023, pp. 1–5. https://doi.org/10.1109/ICTBIG59752.2023.10456172

[12]. M. Dadhich, A. Shukla, M. S. Pahwa, and A. Mathur, “Decentralized Disruptive Crypto Landscape: How Digital Cur-rencies Are Shaking up Finance?,” in *Advancements in Smart Computing and Information Security*, S. Rajagopal, K. Popat, D. Meva, and S. Bajeja, Eds. 2024, pp. 268–282. Springer Nature Switzerland.

[13]. K. Kpodar and I. M. Fund, “ICT, Financial Inclusion , and Growth: Evidence from African Countries Mihasonirina An-drianaivo and Kangni Kpodar,” pp. 1–45, 2014. https://doi.org/10.5089/9781455227068.001

[14]. A. Priyadarshini, N. Dehingia, M. Joshi, D. Singh, S. Chakraborty, & A. Raj, "Spousal support and work performance during the COVID-19 pandemic among elected women representatives in rural Bihar, India: A cross-sectional, mixed-methods study". *eClinicalMedicine*,vol. 53, pp 101743, 2022. https://doi.org/10.1016/j.eclinm.2022.101743

[15]. M. Rafik, N. Q. Ram, and K. Singh, “Decision support model to select crop pattern for sustainable agricultural prac-tices using fuzzy MCDM. Environment,” *Development and Sustainability*, vol. 20, no. 2, pp. 641–659, 2018. https://doi.org/10.1007/s10668-016-9903-7

[16]. V. Somville and L. Vandewalle, “Access to banking, savings and consumption smoothing in rural India,” *J. Public Econ.*, vol. 223, no. 104900, p. 104900, 2023. https://doi.org/10.1016/j.jpubeco.2023.104900

[17]. M. Sonali Bhati and A. S. Dadhich, “Analysis of Rural Microfinance Sustainability: Does Local Insight Driven Governance Work ?,” *RESEARCH REVIEW International Journal of Multidisciplinary*, vol. 9, no. 4, pp. 209–222, 2024. https://doi.org/10.31305/rrijm.2024.v09.n04.024

[18]. J. Srouji, “Digital payments, the cashless economy, and financial inclusion in the United Arab Emirates: Why is everyone still transacting in cash?,” *J. Risk Fin. Manag.*, vol. 13, no. 11, p. 260, 2020. https://doi.org/10.3390/jrfm13110260