

Financial Inclusion and Sustainable Livelihoods: A Study on Marginal and Small Farmers in Odisha

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Abstract

Financial inclusion presently has appeared as a key driver of sustainable livelihoods by facilitating access to financial services, fostering economic resilience, and upgrading the socio-economic development of marginalized populations. This study uses secondary data to examine the association between financial inclusion and the sustainable livelihoods of marginal and small farmers in Odisha between 2018 and 2022. The vital indicators of financial inclusion, like banking penetration, formal agricultural credit, farm income, digital financial transactions, crop insurance coverage, and self-help group (SHG) linkage, are the foundation of this analysis. Additionally, this study examines the climatic sensitivity factors that affect the financial inclusivity and sustainability of marginal and small farmers of Odisha. The results from the tabular analysis indicate that financial inclusion has steadily improved, reflected in easier access to banking services, digital transactions, and development of institutional credit.

At the same time, there is a noticeable increase in insurance coverage, agricultural revenue, and livelihood diversification. However, climate-related risks like rainfall variability, floods, and cyclones still have an adverse impact on agricultural stability, resulting in crop loss and agricultural revenue swings. The resultant analysis suggests that there is a positive correlation between financial inclusion and livelihood stability, but environmental vulnerabilities limit their effectiveness. The study concludes that to ensure sustainable livelihoods among small farmers, inclusive financial systems must be strengthened along with climate-resilient strategies.

Keywords: Financial Inclusion, Livelihood Stability, Climate Risk, SHG Linkage, Digital Financial Services

Introduction:

In India, financial inclusion has become a vital tool for fostering inclusive growth and rural economic development. It guarantees that vulnerable sections like marginal and small farmers have access to affordable financial services, including banking, formal credit, insurance, direct benefit transfer, and digital payment systems. In an agrarian state like Odisha, Financial inclusion plays a pivotal role in enhancing income opportunities, lowering dependence on informal credit, and improving economic resilience. Over the past ten years, various major initiatives have been undertaken to stimulate financial access.

As a result, there is an increase in bank account penetration, formal agricultural credit flow, crop insurance, and direct benefit transfer (DBT), which helps to maintain the livelihood sustainability of small and marginal farmers. These progresses indicate a steady improvement in the state's financial inclusion landscape, which is shown in the subsequent data tables. However, the livelihood sustainability of small and marginal farmers remains a serious concern from a socio-economic viewpoint.

In Odisha, agricultural productivity, income stability, and livelihood sustainability of small and marginal farmers are persistently affected by floods, cyclones, and irregular rainfall. The intensity of these risks is highlighted by the data on rainfall unpredictability, crop loss, and the number of affected farmers. Such environmental uncertainties frequently outweigh the benefits of financial inclusion by growing income volatility and livelihood insecurity. In this context, the relationship between financial inclusion and livelihood outcomes becomes a significant matter of discussion. Improved financial inclusion mechanisms can enhance farmers' ability to invest and manage risks, but their effectiveness depends on the larger socio-economic and environmental conditions. This study's tabular analysis attempts to capture these trends by relating financial inclusion metrics to climate-related variables and livelihood.

Therefore, the purpose of this paper is to analyze how financial inclusion facilitates sustainable livelihoods among marginal and small farmers in Odisha, while simultaneously examining the difficulties caused by climate vulnerability. This study provides insights into the degree to which

financial inclusion can act as a tool for improving resilience and livelihood sustainability by using secondary data along with a structured analytical methodology.

Literature review:

A. Financial Inclusion and Economic Development

The Global Findex database is used by Demirgüç-Kunt et al. (2018) in their studies to show how improved financial access reduces inequality and poverty rates, especially in emerging economies. According to Allen et al. (2020), by increasing access to formal financial services (savings, credit, and payments), financial inclusion is widely acknowledged as a key driver of inclusive growth. Sarma and Pais (2011) exhibit the strong association between financial inclusion and economic development by demonstrating financial inclusion as a multidimensional phenomenon.

B. Financial Inclusion, Agriculture, and Rural Economic Development

According to Binswanger and Khandker (1995), formal lending significantly boosts agricultural productivity and helps to reduce dependency on non-institutional lenders. Additionally, Burgess and Pande (2005) find that expansion of rural banking leads to a reduction in poverty rate and improvement in economic outcomes. Swain and Wallentin (2009) highlight the crucial role of Self-Help Groups (SHGs) in improving financial inclusion and empowering rural women. Furthermore, Cole et al. (2013) show how crop insurance helps farmers to manage climate-related risks and stabilize income. NABARD (2022) demonstrates the role of the SHG-Bank linkage programme in boosting grassroots financial systems, while Swain and Wallentin (2009) highlight the role of SHGs in the path of rural women's empowerment and financial inclusivity.

C. Financial Inclusion initiatives; Financial Awareness and Digital Literacy

Financial Awareness and Digital Literacy programmes have considerably accelerated the financial inclusion process. As per Suri and Jack (2016), mobile money services have long-term promising impacts on gender inclusion and poverty reduction. RBI (2023) reports that the rapid expansion of digital transactions has made India's financial system more transparent and resourceful. Lusardi and Mitchell (2014), emphasize that in order to optimize the benefits of financial inclusion programs, financial literacy is both a necessary and crucial factor as well.

D. Climate Vulnerability, Climate Resilience and Livelihood Sustainability

Agricultural sustainability and rural livelihoods are seriously challenged by the catastrophic impact of climate change. According to IPCC (2021), agricultural productivity is negatively affected by increasing rainfall variability and extreme weather events. FAO (2017) emphasizes that due to limited adaptive capacity, small and marginal farmers are highly exposed to climate risks. Ellis (2000) suggests that livelihood diversification is essential in lowering vulnerability and enhancing resilience.

E. Financial Inclusion, Livelihood Sustainability, and Policy Viewpoint

Resilience-building and sustainable developments are closely associated with financial inclusion from various perspectives. World Bank (2022) suggests that access to formal financial services enhances households' capacity to withstand climate and economic shocks. UNDP (2020) connects financial inclusion with the accomplishment of Sustainable Development Goals (SDGs), particularly in lowering inequality and fostering inclusive growth.

In order to track the progress of financial inclusion, the RBI (2021) has introduced the Financial Inclusion Index to measure access, usage, and quality of financial services with different weightage viewpoint. The World Bank (2021) recognises many obstacles, like lack of financial consciousness, financial literacy, documentation barriers, and the digital divide, that obstruct the achievement of financial inclusivity. On the other hand, the OECD (2020) emphasizes the requirement of integrating livelihood sustainability with financial inclusion strategies.

Research Gap:

In India, the existing studies on financial inclusion mainly focus on national-level outcomes, but the integrated effect of financial inclusion on sustainable livelihoods of small and marginal farmers has received minor attention in Odisha. Furthermore, previous studies repeatedly overlook the relationship between climatic vulnerability factors like rainfall variability, crop loss, and low productivity and financial inclusion indicators, including SHG linkage, direct benefit transfer (DBT), digital transactions, and agricultural credit.

Under environmental strain, there is a lack of region-specific empirical research that links financial inclusion with the livelihood stability of farmers in Odisha. This study integrates the different aspects of climate risk dimensions and financial inclusion to evaluate their combined effect on the livelihood stability of small and marginal farmers in Odisha.

Methodology:

The study uses a descriptive and analytical research design based on secondary data gathered between 2018–2022 from different sources such as NABARD, RBI, government reports, and databases pertaining to the SDGs. Financial inclusion metrics (banking penetration, PMJDY outreach, digital transactions, agricultural credit, SHG linkage), climate-related variables (rainfall variability, flood, cyclone crop loss), and livelihood indicators (farm and non-farm income share, livelihood stability index) are the key variables. To examine the association between financial inclusion and livelihood outcomes, data is analyzed using simple statistical techniques and trend analysis, including regression analysis and comparative tables. Understanding of both economic and environmental effects on farmer sustainability is made possible by this method. Based on secondary sources, the tables are prepared for explanatory and analytical purposes.

Objectives:

- To assess the progress and extent of financial inclusion among small and marginal farmers in Odisha.
- To examine the impact of financial inclusion on agricultural development, income generation and livelihood stability.
- To evaluate the effectiveness of financial inclusion in mitigating climate-related risks on agricultural outcomes.

Theoretical Background:

The theoretical foundation of this study is based on the intersection of financial inclusion theory, risk management perspective, and sustainable livelihood framework. As per financial inclusion theory, access to affordable and timely financial services like credit, savings, insurance, and digital payments enhances economic participation, lowers poverty, and fosters inclusive growth. The Sustainable Livelihood Framework (SLF) highlights how institutions and external shocks influence livelihood outcomes. From the perspective of marginal and small farmers, financial inclusion improves income stability and resilience through affordable and timely credit access, SHG connections, and insurance coverage. In addition, the risk and vulnerability framework

describes how agricultural productivity and income are affected by climate-related variables such as rainfall variability, cyclones, and crop loss. Therefore, the integration of these theoretical perspectives highlights that financial inclusion can augment livelihood sustainability, whereas its efficacy depends on the ability to alleviate environmental risks and reinforce adaptive capacity.

Data Analysis:

Table I: Indicators of Financial Inclusion in Odisha

Year	Bank Branches per 1 Lakh Population	% Households with Bank Accounts	Credit to Agriculture (₹ Crore)	SHGs Linked to Banks (No.)	Digital Transactions (in Million)
2018	8.5	72	45,000	3,20,000	120
2019	9.2	78	48,500	3,50,000	180
2020	10.1	85	52,000	3,80,000	250
2021	10.8	88	56,000	4,10,000	340
2022	11.5	92	60,000	4,50,000	450

Source: Author's compilation based on data from RBI, World Bank Global Findex Database, NABARD, and NPCI.

Table 1 indicates a consistent increase in financial inclusion as reflected in both access and usage of financial services from 2018 to 2022 in Odisha. The number of bank branches per lakh people increased from 8.5 to 11.5, indicating better banking outreach. Simultaneously, the percentage of households with bank accounts rose notably from 72% to 92%, demonstrating the accomplishment of financial inclusion initiatives like PMJDY. Credit to agriculture increased from ₹45,000 crore to ₹60,000 crore, signifying improved institutional financial support to small and marginal farmers, while stronger grassroots financial integration was noted from an increase in the number of SHGs linked to banks. Furthermore, digital transactions witnessed extensive growth from 120 million to 450 million, signifying a rise in the use of digital financial services. Therefore, these trends show a noteworthy improvement in intensifying financial inclusion initiatives.

Table II: Livelihood Indicators of Small Farmers in Odisha

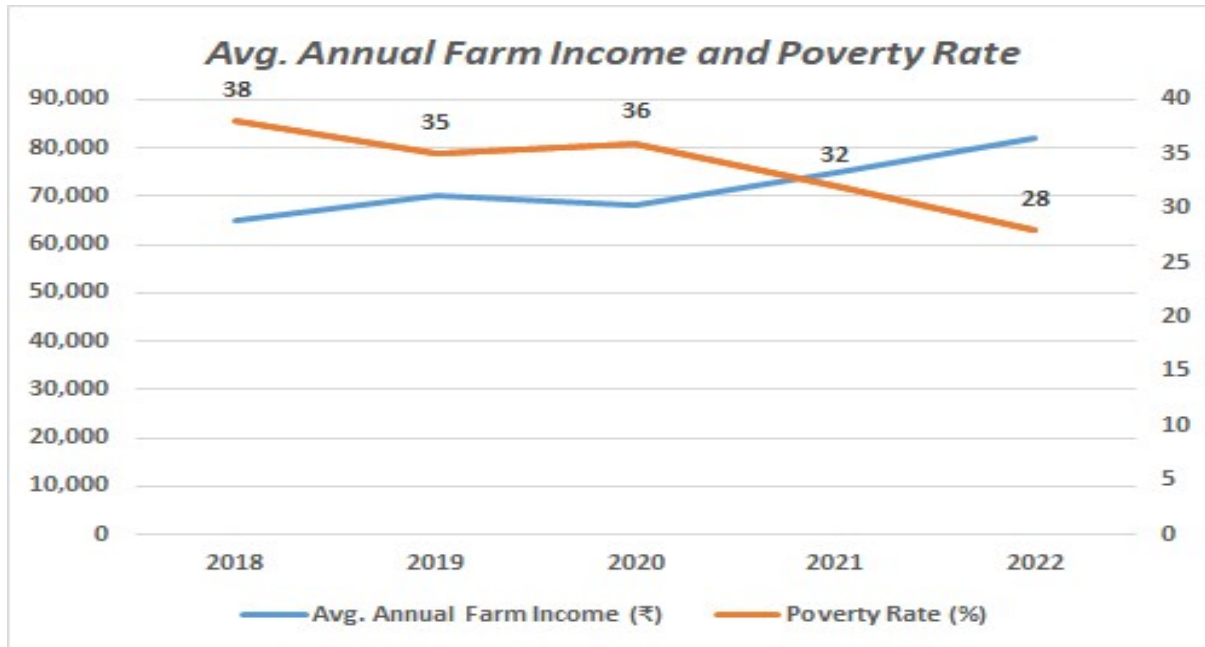
Year	Avg. Annual Farm Income (₹)	% Farmers with Crop Insurance	Irrigated Land (%)	Non-Farm Income Share (%)	Poverty Rate (%)
2018	65,000	18	32	22	38
2019	70,000	22	35	25	35
2020	68,000	28	36	30	36
2021	75,000	35	38	34	32
2022	82,000	40	41	38	28

Source: Author's compilation based on data from Ministry of Agriculture & Farmers Welfare, NSSO, PMFBY reports, Agricultural Statistics, and NITI Aayog.

With modest fluctuations, Table II shows a steady improvement in the economic conditions of small and marginal farmers from 2018 to 2022 in Odisha. Regardless of a slight dip in 2020, average annual farm income improved from ₹65,000 in 2018 to ₹82,000 in 2022. A remarkable improvement in better risk management and financial awareness is noticed from the significant increase in the percentage of farmers covered by crop insurance (18% to 40%). The percentage of irrigated land extended from 32% to 41%, which shows an improvement in agricultural productivity.

At the same time, the percentage of non-farm income improved from 22% to 38%, indicating diversification of sources of farmers' income and a decrease in reliance on agricultural income alone. An overall improvement in living standards and rural economic resilience are noticed from a decline in the poverty rate from 38% to 28%.

Fig: 1



It is clear from the fig: 1, the poverty rate decreases with an increase in average annual farm income. It is more prominently visible in the year 2000; a decrease in average annual farm income leads to an increase in the poverty rate. So it may be concluded that improvement in the poverty rate depends on an enhancement of average annual farm income. However, poverty is caused by many other factors.

Table III: Climate Vulnerability Indicators in Odisha

Year	Rainfall Variability (%)	No. of Cyclones/Flood Events	Crop Loss (%)	Farmers Affected (in Lakhs)
2018	12	1	15	8.5
2019	18	2	22	10.2
2020	20	2	25	11.5
2021	15	1	18	9
2022	22	3	28	12.8

Source: Author's compilation based on data from IMD, OSDMA and Ministry of Agriculture & Farmers Welfare reports.

Note: Due to the limited availability of consistent district-level climate data, Odisha-level indicators have been used as proxies to assess climate vulnerability in Kendrapada district.

Table III illustrates the growing climate-related risks affecting agricultural productivity and farm income between 2018 and 2022. The growing unpredictability in weather patterns is noticed from rainfall variability, from 12% in 2018 to a peak of 22% in 2022. As a result, crop losses increased drastically from 15% to 28%, indicating greater exposure of agricultural output to climate shocks. Consequently, a large number of farmers have been affected by the climate shocks over the period. Overall, all these trends suggest that growing climate risks are the root cause of higher agricultural losses and misery among farmers.

Table IV: Financial Inclusion and Livelihood Stability Analysis

Year	Financial Inclusion Index (Composite)	Avg. Income (₹)	Crop Loss (%)	Livelihood Stability Index
2018	0.45	65,000	15	0.4
2019	0.52	70,000	22	0.45
2020	0.6	68,000	25	0.42
2021	0.68	75,000	18	0.55
2022	0.75	82,000	28	0.58

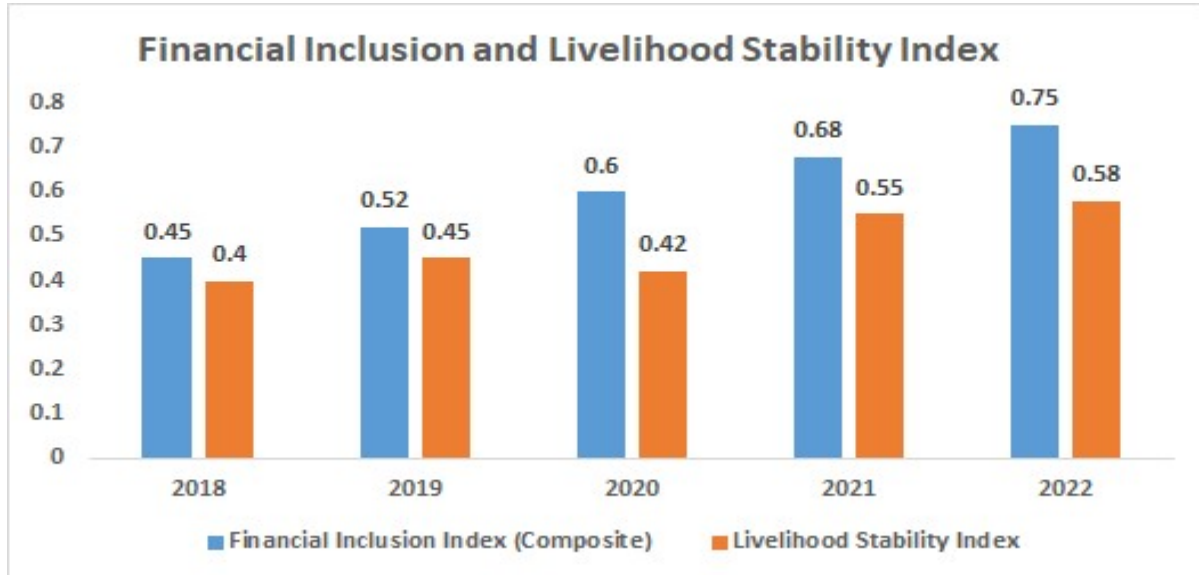
Source: Author’s Compilation from secondary data from RBI, NABARD, NSSO, Ministry of Agriculture & Farmers Welfare, and OSDMA.

Note: The Financial Inclusion Index (FII) and Livelihood Stability Index (LSI) are composite indices computed by the author using normalized values of selected financial inclusion and livelihood indicators.

Table IV shows a positive or direct association between the financial inclusion index and livelihood stability index from 2018 to 2022, regardless of external shocks. A steady increase in the financial index from 0.45 to 0.75 (2018 to 2022) indicates better access to and usage of financial services. Average income of marginal and small farmers has increased from ₹65,000 to ₹82,000 in the study period. The ongoing vulnerability to climate risks is noticeable in the fluctuation of crop loss percentages from 2018 to 2022. Regardless of this, the Livelihood Stability Index improved from 0.40 to 0.58, signifying that increased financial inclusion, improved support

systems, and diversification of income have helped farmers to secure more decent and stable livelihoods over time.

Fig: 2



It is clear from the fig: 2, there is a positive relationship between the FI index and the LS index. However, the LS index has decreased despite an increase in the FI index in the year 2020. So, it is required to widen the horizon of financial inclusion initiatives in the vulnerable regions. So, an improvement in the FI index is inevitable to achieve sustainable livelihoods for marginal and small farmers.

Implications of the study:

The findings have significant implications for financial institutions, policymakers, and development organizations to make tailor-made strategies to address the challenges related to financial inclusion and climate resilience. The income stability and resilience among small farmers can be enhanced significantly by strengthening financial inclusion through extended banking access, digital financial services, insurance, and SHG-based models.

However, financial inclusion programs need to be integrated with climate-resilient strategies to address the challenges related to crop insurance, agricultural productivity, irrigation systems, crop loss, and disaster risk management. A combined approach of financial inclusion and environmental sustainability is important to achieve long-term rural development, primarily vulnerable regions like Odisha.

Limitations:

1. Use of secondary data is the major limitation of this study, as it limits the availability, consistency, and accuracy with respect to the regional level.
2. The time period from 2018 to 2022 is too short to evaluate the structural changes and long-term consequences of the variables.
3. Variables, like climate vulnerability and livelihood sustainability, are represented by substitute indicators which might not be able to reflect the ground-level realities accurately or fully.
4. The absence of primary data or field-level insights limits the understanding of institutional and behavioural factors affecting financial inclusion.

Conclusion:

The study highlights that financial inclusion has played a noteworthy role in improving the livelihoods of marginal and small farmers in Odisha by facilitating access to banking services along with formal institutional credit, crop insurance, and digital financial platforms. The inclusive financial systems positively enhance the sustainable livelihoods and economic resilience of marginal and small farmers in vulnerable regions. However, agricultural stability and income consistency have been affected by climate-related risks like unpredictable rainfall, cyclones, crop losses, and low productivity.

Therefore, a comprehensive strategy that integrates climate-resilient agricultural practices and helpful policy interventions with financial inclusion is indispensable to ensure long-term sustainable livelihoods for farmers in the vulnerable region of Odisha.

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