



Economic Well-being and Indebtedness of Farmers in Bihar: A Comparative Analysis (2002-03 and 2018-19)

Dr. Ajad Singh¹ and Madhurendra Singh²

¹Associate Professor, Economics Department, Motilal Nehru College- Delhi University, New Delhi

²Assistant Professor, Economics Department, Dyal Singh College- Delhi University, New Delhi

DOI: <https://doi.org/10.55248/gengpi.5.0724.1941>

ABSTRACT

This paper examines the economic well-being and indebtedness of farmers in Bihar, using data from the Situation Assessment Surveys (SAS) of 2002-03 and 2018-19. The study focuses on changes in landholding patterns, credit accessibility, income trends, and indebtedness among different farmer categories. The findings reveal a significant increase in marginal and small landholdings and improved credit access, though indebtedness remains prevalent. Income analysis shows a positive growth trajectory in agricultural and overall earnings, albeit with considerable disparities among farmer categories. Consumption expenditure has increased substantially, indicating better living standards but also greater financial strain. Despite these advancements, the high levels of debt underscore the need for targeted financial interventions and sustainable agricultural policies to support Bihar's farmers. These insights are critical for policymakers to address the economic challenges faced by the farming community and promote long-term agricultural stability in the region.

Keywords: *Economic Well-being, Indebtedness, Landholding Patterns, Credit Accessibility, Agricultural Income, Consumption Expenditure*

Introduction

Bihar, a state located in the eastern part of India, is characterized by its diverse geographical and economic attributes. Geographically, Bihar is predominantly flat, with the fertile plains of the Ganges River flowing through it. This topography has historically positioned Bihar as a significant agrarian state, making agriculture a vital part of its economy.

Agriculture in Bihar plays a critical role in India's agricultural landscape, contributing significantly to crop production and livestock rearing. The state is one of the largest producers of rice, wheat, maize, and pulses in the country. Its fertile land, coupled with the extensive river network, provides favorable conditions for diverse agricultural activities. Livestock farming is also an integral part of Bihar's rural economy. These agricultural activities not only support the state's economy but also ensure food security and provide employment to a vast majority of the rural population.

Studying agricultural households in Bihar is essential for understanding rural living standards and the quality of employment. Agricultural households are a crucial demographic, as their economic well-being directly impacts the overall rural economy. By examining the economic conditions of these households, we can gain insights into their income levels, consumption patterns, and debt burdens. This understanding is vital for policymakers aiming to improve rural living standards, enhance agricultural productivity, and ensure sustainable development.

Analyzing income, consumption, and debt trends among agricultural households is of paramount importance. Income levels determine the economic stability and purchasing power of households, influencing their ability to invest in better farming practices and improve their quality of life. Consumption patterns reflect the standard of living and economic behavior of households, indicating their ability to meet essential needs and save for future contingencies. Debt trends reveal the financial pressures and credit accessibility faced by farmers, impacting their capacity to sustain agricultural activities and manage economic risks. By examining these trends, we can assess the financial health of agricultural households and identify areas needing policy intervention to support farmer welfare and economic stability.

The value of comparing data from the 59th and 77th rounds of the National Sample Survey Office (NSSO) lies in its ability to track longitudinal changes and assess policy impacts over time. The 59th round of the Situation Assessment Survey (SAS) conducted in 2002-03 and the 77th round conducted in 2018-19 provide comprehensive data on various aspects of farmer households, including income, expenditure, and indebtedness. By analyzing these datasets, we can identify significant shifts in economic conditions, evaluate the effectiveness of past policies, and formulate strategies for future interventions.

This paper aims to provide a comparative analysis of the economic well-being and indebtedness of farmer households in Bihar between 2002-03 and 2018-19. Through this analysis, we seek to understand the changes in landholding patterns, credit accessibility, income, and consumption expenditure

trends among agricultural households. The insights gained from this study will contribute to a deeper understanding of the economic challenges and opportunities faced by farmers in Bihar, guiding policymakers in developing targeted interventions to enhance farmer welfare and ensure sustainable agricultural growth.

Literature Review of the Study

Shekhawat and Kumari (2023) explore the dual impact of farmer indebtedness on sustainability in Indian agriculture, highlighting how debt hampers agricultural output and exacerbates socio-economic disparities. They argue that government interventions, particularly those that promote financial literacy and provide incentives like zero-interest loans, could mitigate the adverse effects of debt on rural farmers. This study underscores the critical role of policy in shaping the financial well-being of farmers and suggests pathways for reducing rural indebtedness through targeted government programs.

Kannan and Pohit (2014) present a comprehensive framework for diagnosing the constraints to agricultural growth in Bihar. Their research identifies critical barriers such as inadequate infrastructure, limited access to credit, and inefficiencies in input supply systems. By addressing these constraints through targeted policy measures, substantial improvements in agricultural productivity and farmer incomes can be achieved. This paper is crucial for understanding the structural issues that impede agricultural development in Bihar and offers policy recommendations for enhancing economic well-being.

Singh et al. (2013) provide an in-depth analysis of rural poverty in Bihar through a village-level study. Their findings indicate that poverty is multifaceted, influenced by factors such as land ownership, access to education, and availability of credit. They highlight the persistent challenges faced by marginal farmers and the need for comprehensive development programs that address both economic and social dimensions of poverty. This study is instrumental in understanding the broader socio-economic context within which farmer indebtedness occurs.

Kumari and Badal (2020) examine the socio-economic conditions of farmers in the rice-fallow areas of Bhagalpur District, Bihar. Their research reveals significant challenges, including limited access to resources, fluctuating market prices, and high levels of indebtedness, all of which severely impact the economic stability of these farmers. They suggest that improving market linkages and providing better financial services could enhance the living standards of these farmers. This paper adds valuable insights into the regional variations in farmer well-being and indebtedness, emphasizing the need for targeted interventions to support these vulnerable communities.

Singh et al. (2014) analyze the agricultural landscape of Bihar and propose development strategies to boost productivity and farmer incomes. Their research emphasizes the importance of modernizing agricultural practices, improving access to credit, and enhancing infrastructure. They argue that a holistic approach, integrating both technological and financial interventions, is essential for sustainable agricultural development. This paper is crucial for understanding the policy framework needed to support farmer well-being in Bihar.

Datta, Tiwari, and Shylajan (2018) conduct a comprehensive analysis of the factors contributing to farmer indebtedness in India. Their study utilizes household survey data and advanced statistical methods to identify key determinants such as occupation, technology adoption, and medical expenses. The authors suggest promoting non-farm income opportunities and modern agricultural technologies to alleviate debt burdens. This research provides a quantitative basis for understanding the drivers of indebtedness and informs strategies for economic improvement.

Kumar et al. (2017) investigate the income dynamics in Bihar through village-level studies. Their research reveals that farm households in Bihar have low income levels, heavily influenced by landholding size. The study emphasizes the need for diversifying income sources beyond agriculture to improve economic well-being. This paper is significant for understanding the income patterns and economic challenges faced by farmers in Bihar.

Kumar et al. (2019) analyze the determinants of farm household income in Bihar using panel data from selected villages. Their findings highlight the low income levels among farm households despite significant growth rates. They find a strong correlation between landholding size and income levels and stress the importance of income diversification. This research provides empirical evidence on the economic conditions of farmers in Bihar and suggests strategies for income enhancement.

Maurya and Vishwakarma (2021) examine the status of agricultural credit and indebtedness in India, highlighting the challenges small and marginal farmers face in accessing formal credit. Their study discusses the reliance on informal credit sources and the need for improving the credit delivery system. The authors recommend enhancing financial literacy and reducing borrowing costs to address indebtedness issues. This paper offers a broader perspective on the financial challenges faced by farmers and suggests systemic improvements.

Pandey and Sanjeev (2019) focus on the perpetuity of tribal indebtedness in India. Their study explores the socio-economic factors contributing to sustained indebtedness among tribal communities. They argue for targeted financial interventions and improved access to credit to break the cycle of debt. This research provides insights into the unique challenges faced by tribal farmers and suggests specific measures to enhance their economic well-being.

Objective of The study

1. *Analyze Changes in Landholding Patterns and Credit Accessibility Among Farmers in Bihar from 2002-03 to 2018-19.*

2. *Investigate the Trends in Agricultural and Overall Income for Farmers in Bihar*
3. *Examine Indebtedness among Farmers of different Landholding Size in Bihar*

Research Methodology of the Study

Data Source

This study utilizes data from the Situation Assessment Survey (SAS) of Farmer Households conducted in 2003 and 2019. The 2003 survey was part of the 59th round carried out by the National Sample Survey Office (NSSO), under the Ministry of Statistics and Programme Implementation, Government of India. This round aimed to evaluate the living standards of the farming community by gathering detailed information on various aspects such as consumer expenditure, income, productive assets, indebtedness, farming practices, resource availability, and access to modern agricultural technology. The survey covered rural areas exclusively and sampled approximately 51,770 farmer households across 6,638 villages in India using a stratified multi-stage design. Specifically, for Bihar, the sample included 3,970 farmer families, representing a total population of 24,206 individuals.

The 77th round of the SAS, conducted from January to December 2019, focused on "Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households" in rural India. This round introduced an integrated schedule of enquiry, combining the Land and Livestock Holding Surveys (LHS) with the SAS of Agricultural Households. The survey aimed to generate indicators such as ownership and operational holdings, livestock ownership, income, productive assets, indebtedness, farming practices, awareness of technological developments, and the economic activities of agricultural households. Data collection was carried out in two visits from the same set of sample households, covering the agricultural year from July 2018 to June 2019. For Bihar, the survey included a sample of 3,927 farmer families who fulfilled the condition of being active agricultural households, representing a total population of 21,457.

Comparability Issues

A significant challenge in comparing the results of the 59th and 77th rounds of SAS is the change in definitions and methodologies between the two surveys. In the 2003 survey, a "farmer household" was defined as one with at least one member who possessed some land and engaged in agricultural activities on any part of that land during the previous 365 days. In contrast, the 2018-19 survey defined an "agricultural household" as one that received more than Rs. 4000 in value from agricultural activities over the preceding 365 days and had at least one member self-employed in agriculture either in principal or subsidiary status. Despite these differences, macro-level comparisons can still provide valuable insights into trends and changes in the agricultural sector over time. In this study, the terms "farmer family" and "agricultural household" are used interchangeably for the sake of general analysis.

Data Adjustment and Conversion

To accurately compare the income of agricultural households between the years 2002-03 and 2018-19, it is essential to adjust these values for inflation, using a consistent base year. For this analysis, we chose the 2016-17 base year. The first step involved obtaining the annual Consumer Price Index (CPI) data from the Reserve Bank of India's website (<https://rbi.org.in/Scripts/PublicationsView.aspx?id=21844>). The original CPI values were based on the 1986-87 base year, and these values were converted to the 2016-17 base year using the following formula:

$$\text{CPI (2016-17 base)} = \left(\frac{\text{CPI (1986-87 base)}}{\text{CPI for 2016-17 (1986-87 base)}} \right) \times 100$$

For example, the CPI for 2002-03 was 319, and for 2018-19, it was 907, with the CPI for the base year 2016-17 being 870. This conversion gave us the following CPI values on the 2016-17 base:

$$\text{CPI (2016-17 base) for 2002-03} = \left(\frac{319}{870} \right) \times 100 \approx 36.67$$

$$\text{CPI (2016-17 base) for 2018-19} = \left(\frac{907}{870} \right) \times 100 \approx 104.25$$

Using these adjusted CPI values, nominal incomes for the years 2002-03 and 2018-19 were converted to real incomes, thus providing a clearer picture of the economic changes over time.

Analytical Approach

The analysis of this study focuses on several key aspects:

1. **Landholding Patterns:** Examining how the proportions of marginal, small, medium, and large landholding categories have shifted over time.
2. **Credit Accessibility:** Investigating how the percentage of loanee families has changed across different landholding categories and identifying factors that might explain these changes.
3. **Income and Consumption Trends:** Analyzing the trends in the annual earning from agricultural activities, overall household income, and annual consumption expenditure among agricultural households.

4. **Economic Burden of Loan:** Assessing the trends in farmer indebtedness, annual interest burden, and changes in interest rate patterns.

The data from the 59th and 77th rounds of the SAS provide a comprehensive basis for a longitudinal analysis. By comparing these two datasets, the study aims to identify and interpret significant trends and changes in the economic well-being and indebtedness of agricultural households in Bihar over the 16-year period. This comparison allows for the assessment of policy impacts and the identification of areas that require further attention and intervention to enhance the economic stability and welfare of farmers in the region.

Overall, this research methodology integrates data collection, adjustment for inflation, and a detailed analytical framework to provide a robust and comprehensive understanding of the economic well-being and indebtedness of farmer households in Bihar. The findings of this study are intended to inform policymakers, researchers, and stakeholders about the evolving economic landscape of the agricultural sector in Bihar and to contribute to the formulation of effective policies aimed at improving the livelihoods of farmers in the state.

Analysis of the Study

Landholding Patterns and Credit Accessibility Among Farmers

As per Table 1, a comparative analysis of landholding patterns and credit accessibility among farmers in Bihar from 2002-03 to 2018-19 reveals several significant trends and shifts. These changes reflect the evolving socio-economic dynamics within the state's agricultural sector over the 16-year period.

Table 1: Bihar Farmers' Landholdings and Loan Accessibility Trends (2002-03 and 2018-19)

Year	Farmer Category	Farmer Households	%age Family	Avg Land (Acre)	%age Loanee
2002-03	Marginal(< 1 Acre)	4,080,675	57.6	0.4	40.1
	Small (1-1.99 Acre)	1,349,588	19.1	1.4	27.8
	Medium (2-4.99 Acre)	1,245,318	17.6	3.0	21.7
	Large (5 Acre & more)	404,824	5.7	9.7	17.5
	Overall	7,080,406	100.0	1.6	33.2
2018-19	Marginal(< 1 Acre)	4,650,421	66.3	0.4	39.3
	Small (1-1.99 Acre)	1,478,750	21.1	1.5	38.9
	Medium (2-4.99 Acre)	734,570	10.5	2.9	41.0
	Large (5 Acre & more)	148,526	2.1	7.8	50.0
	Overall	7,012,267	100.0	1.0	39.7

The results are estimated by the author from SAS 2002-03 and SAS 2018-19.

Changes in Landholding Patterns

The data indicates a notable shift in the proportions of different landholding categories among farmer households in Bihar. In 2002-03, marginal farmers, who hold less than 1 acre of land, constituted 57.6% of the total farmer households. By 2018-19, this proportion had increased to 66.3%. This rise suggests a growing fragmentation of landholdings, possibly due to population growth and the division of land among heirs.

Conversely, the proportion of small farmers (those holding between 1 and 1.99 acres) increased slightly from 19.1% to 21.1%. However, more significant changes are observed in the medium and large farmer categories. Medium farmers (holding between 2 and 4.99 acres) decreased from 17.6% to 10.5%, while large farmers (holding 5 acres or more) saw a significant reduction from 5.7% to just 2.1% over the same period. These changes reflect an overall trend towards smaller landholdings, which can have implications for agricultural productivity and economic stability.

Average Landholding Size

The average landholding size among agricultural families in Bihar has decreased over time. In 2002-03, the overall average landholding was 1.6 acres, whereas in 2018-19, it reduced to 1.0 acre. This decline in average land size is consistent with the increasing proportion of marginal and small farmers and the corresponding decrease in medium and large farmers. The average land size for marginal farmers remained stable at 0.4 acres, while the average land size for small farmers increased slightly from 1.4 to 1.5 acres. For medium and large farmers, the average land size decreased from 3.0 to 2.9 acres and from 9.7 to 7.8 acres, respectively. These trends highlight the ongoing fragmentation of agricultural land in Bihar, which can challenge the viability of farming as a sustainable livelihood.

Credit Access

The percentage of loanee families across different landholding categories also shows notable changes. In 2002-03, 40.1% of marginal farmer households had access to credit. This figure slightly decreased to 39.3% in 2018-19. However, credit access among small, medium, and large farmers increased significantly. For small farmers, the percentage of loanee families rose from 27.8% to 38.9%, for medium farmers from 21.7% to 41.0%, and for large farmers from 17.5% to 50.0%. Overall, the percentage of farmer households with access to credit increased from 33.2% to 39.7%.

Socio-Economic Implication

These trends can be interpreted in the context of broader socio-economic changes in Bihar. The increase in the proportion of marginal and small farmers, along with the decline in medium and large farmers, suggests ongoing land fragmentation, possibly driven by inheritance practices and population pressures. This fragmentation can reduce the economies of scale in farming, making it more challenging to achieve high productivity and profitability. Small and marginal farmers often face difficulties in accessing modern agricultural technologies and inputs, which can further constrain their productivity and income.

The increase in credit access among small, medium, and large farmers indicates a positive development, reflecting improved financial inclusion and access to institutional credit. However, the slightly reduced credit access for marginal farmers suggests that this group may still face barriers in obtaining loans, possibly due to their limited collateral and higher perceived credit risk. Improved credit access can enhance farmers' ability to invest in productive assets, adopt better farming practices, and manage risks, thereby potentially improving their economic well-being.

Overall, the data underscores the importance of tailored policy interventions to address the specific needs of different farmer categories in Bihar. For marginal and small farmers, measures to improve land consolidation, access to modern technologies, and targeted financial services are crucial. For medium and large farmers, continued support for credit access and sustainable farming practices can help maintain and enhance their productivity and economic stability. Understanding these trends and their underlying drivers is essential for formulating effective agricultural and rural development policies that promote inclusive growth and enhance the livelihoods of all farmers in Bihar.

Farmer's Earning and Consumption Expenditure Pattern in Bihar

Analyzing the trends in farmer income and consumption patterns in Bihar from 2002-03 to 2018-19 reveals insightful shifts in economic dynamics within the agricultural sector, as depicted in Tables 2, 3, and 4. These changes provide a comprehensive view of how agricultural households in Bihar have fared over the years, considering both their earnings from agricultural activities and their annual consumption expenditures.

Farmer Agricultural and Gross Earning Trends in Bihar

Table 2: Farmer's Annual Earning from Agricultural Activities in Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	17,336	29,261	68.8
Small (1-1.99 Acre)	37,839	51,028	34.9
Medium (2-4.99 Acre)	62,557	82,320	31.6
Large (5 Acre & more)	169,534	222,689	31.4
Overall	37,900	43,507	14.8

Data are in rupees (Rs.) at constant prices of 2016-17. Estimated from SAS 2002-03 and SAS 2018-19.

Table 2 outlines the annual earnings derived solely from agricultural activities by different categories of farmers in Bihar. It is crucial to note that these earnings represent income generated from farming operations alone and do not account for other sources of household income, such as wages from non-agricultural activities or remittances.

From 2002-03 to 2018-19, there has been varying growth in agricultural earnings across different farmer categories:

- **Marginal Farmers (< 1 Acre):** Experienced a notable increase of 68.8% in earnings, indicating some improvement in agricultural productivity despite limited landholdings.
- **Small Farmers (1-1.99 Acre):** Saw a moderate growth of 34.9% in earnings, reflecting stable but modest agricultural income growth.
- **Medium Farmers (2-4.99 Acres):** Showed a 31.6% increase in earnings, suggesting steady agricultural performance over the years.
- **Large Farmers (5 Acres & more):** Also recorded a 31.4% increase in earnings, indicating consistent agricultural profitability despite their larger operational scale.
- **Overall:** The overall increase in agricultural earnings for Bihar farmers was 14.8%, reflecting the aggregate performance across all categories.

These trends highlight a positive growth trajectory in agricultural earnings, albeit with varying rates among different farmer categories. Factors contributing to these trends could include improvements in farming practices, adoption of technology, government policies, and climatic conditions affecting crop yields.

Table 3:Farmer Household Annual Earning Level in Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	46,124	67,176	45.6
Small (1-1.99 Acre)	53,509	84,800	58.5
Medium (2-4.99 Acre)	74,744	122,743	64.2
Large (5 Acre & more)	189,843	281,459	48.3
Overall	60,782	81,252	33.7

Data are in rupees (Rs.) at constant prices of 2016-17. Estimated from SAS 2002-03 and SAS 2018-19.

Table 3 presents the total household earnings, encompassing both agricultural and non-agricultural sources, offering a broader perspective on overall household income levels.

Household Earnings Trends Analysis

The data reveals the following changes in household earnings from 2002-03 to 2018-19:

- **Marginal Farmers (< 1 Acre):** Witnessed a 45.6% increase in total household earnings, reflecting additional income sources beyond agriculture.
- **Small Farmers (1-1.99 Acre):** Experienced a robust growth of 58.5% in household earnings, indicating diversification or increased productivity in both agricultural and non-agricultural sectors.
- **Medium Farmers (2-4.99 Acres):** Recorded a significant rise of 64.2% in household earnings, indicating substantial economic improvement.
- **Large Farmers (5 Acres & more):** Showed a substantial increase of 48.3% in household earnings, demonstrating strong economic growth and likely diversification beyond agriculture.
- **Overall:** Bihar's overall household earnings grew by 33.7%, underscoring broad-based economic gains across different farmer categories.

These trends suggest that while agricultural income growth is significant, the overall household income growth is bolstered by contributions from non-agricultural activities, such as wage employment or small businesses. This diversification can enhance household resilience against agricultural risks and seasonal income fluctuations.

Annual Consumption Expenditure Trends in Bihar

Table 4:Farmer Household Annual Consumption Expenditure Trend Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	30,734	64,527	110.0
Small (1-1.99 Acre)	28,902	69,260	139.6
Medium (2-4.99 Acre)	31,083	79,591	156.1
Large (5 Acre & more)	33,605	104,326	210.4
Overall	30,610	67,946	122.0

The consumption expenditure are in rupees (Rs.) at constant prices of 2016-17. It is only out of pocket expenditure during the year. It is Estimated from SAS 2002-03 and SAS 2018-19.

Table 4 outlines the trends in annual consumption expenditure, representing out-of-pocket expenditures on non-durable goods by farmer households in Bihar.

Consumption Expenditure Trends Analysis

The data reveals substantial increases in annual consumption expenditure from 2002-03 to 2018-19:

- **Marginal Farmers (< 1 Acre):** Witnessed a significant rise of 110.0% in consumption expenditure, reflecting increased spending on basic necessities.
- **Small Farmers (1-1.99 Acre):** Experienced a sharp increase of 139.6%, indicating higher spending capacity on essential items.
- **Medium Farmers (2-4.99 Acres):** Recorded a substantial growth of 156.1% in consumption expenditure, reflecting improved living standards and higher discretionary spending.
- **Large Farmers (5 Acres & more):** Showed a substantial increase of 210.4% in consumption expenditure, suggesting higher standards of living and increased purchasing power.
- **Overall:** Bihar's overall consumption expenditure rose by 122.0%, reflecting increased household welfare and economic growth.

These trends highlight the growing consumption needs and improved living standards among farmer households in Bihar. Factors contributing to higher consumption expenditure include rising incomes, improved access to goods and services, and changing consumption patterns influenced by urbanization and modernization.

Socio-Economic Implications

The observed trends in farmer income and consumption patterns underscore several socio-economic dynamics in Bihar's agricultural sector. The growth in agricultural earnings reflects improvements in productivity and possibly better market access for agricultural produce. Concurrently, the substantial increases in household earnings and consumption expenditures indicate broader economic growth, driven by both agricultural and non-agricultural activities.

The disparity in income growth rates between agricultural earnings and total household earnings highlights the increasing importance of diversifying income sources beyond agriculture. This diversification not only enhances household income but also buffers against agricultural risks such as crop failures or price fluctuations.

The significant rise in consumption expenditure across all farmer categories suggests improved welfare and quality of life among Bihar's farming communities. However, it also underscores challenges such as inflationary pressures and the need for sustainable income growth to support increased spending.

In conclusion, these trends emphasize the complex interplay between agricultural productivity, household income diversification, and consumption patterns in Bihar. Policy interventions aimed at enhancing agricultural productivity, promoting rural non-farm activities, and improving market linkages can further bolster economic resilience and improve the well-being of farmer households in Bihar.

Trends of Indebtedness and its burden on Farmer in Bihar

Understanding the trends in farmer's indebtedness, annual interest burden, and changes in interest rate patterns in Bihar from 2002-03 to 2018-19 is essential for assessing the financial dynamics impacting agricultural households. This analysis begins with acknowledging the crucial role of loans for farmer families, particularly in enhancing agricultural productivity, meeting operational expenses, and managing income volatility. Access to affordable loans is paramount for farmers as it provides crucial liquidity during planting seasons, invests in technology and inputs, and mitigates risks associated with crop failures or price fluctuations.

Farmer Indebtness Trends in Bihar

Table 5: Debt Burden on Indebted Farmer in Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	25,727	45,286	76.0
Small (1-1.99 Acre)	37,047	54,721	47.7
Medium (2-4.99 Acre)	78,237	97,099	24.1
Large (5 Acre & more)	131,291	198,132	50.9
Overall	36,741	56,933	55.0
Data are in rupees (Rs.) at constant prices of 2016-17. Estimated from SAS 2002-03 and SAS 2018-19.			

Table 5 illustrates the debt burden carried by different categories of farmers in Bihar over the specified period. It reflects the total indebtedness per farmer category and the relative percentage change, adjusted to constant prices of 2016-17.

Debt Burden Trends Analysis

From 2002-03 to 2018-19:

- **Marginal Farmers (< 1 Acre):** Experienced a substantial 76.0% increase in debt burden, indicating heightened reliance on credit despite relatively small landholdings.
- **Small Farmers (1-1.99 Acre):** Saw a 47.7% rise in debt burden, reflecting increased borrowing needs to sustain agricultural operations and household expenses.
- **Medium Farmers (2-4.99 Acres):** Witnessed a moderate 24.1% increase in debt burden, suggesting prudent borrowing practices or improved financial management.
- **Large Farmers (5 Acres & more):** Recorded a 50.9% increase in debt burden, possibly due to investments in larger-scale farming activities or diversification into allied sectors.
- **Overall:** Bihar's overall debt burden increased by 55.0%, highlighting the growing financial pressures on agricultural households.

These trends signify a general trend of increased indebtedness across all farmer categories, driven by various factors including rising input costs, unpredictable weather patterns, and limited alternative income sources outside agriculture. The relative increase in debt burden underscores the challenges farmers face in managing their financial obligations amidst fluctuating agricultural incomes.

Farmer Annual cost of Loan Trends in Bihar

Table 6: Annual Interest Paid by Farmer of Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	9,440	9,476	0.4
Small (1-1.99 Acre)	9,165	10,049	9.6
Medium (2-4.99 Acre)	15,272	10,860	-28.9
Large (5 Acre & more)	20,453	17,118	-16.3
Overall	10,398	9,949	-4.3

Data are in rupees (Rs.) at constant prices of 2016-17. Estimated from SAS 2002-03 and SAS 2018-19.

Table 6 details the annual interest paid by farmers in Bihar, reflecting the financial cost associated with servicing agricultural loans over time.

Annual Interest Burden Trends Analysis

Over the period:

- **Marginal Farmers (< 1 Acre):** Experienced a negligible 0.4% change in annual interest payments, indicating stability in interest rates or stable borrowing patterns.
- **Small Farmers (1-1.99 Acre):** Saw a moderate 9.6% increase in interest payments, suggesting higher borrowing or possibly higher interest rates on loans taken.
- **Medium Farmers (2-4.99 Acres):** Witnessed a significant 28.9% decrease in interest payments, possibly due to lower interest rates or improved loan terms.
- **Large Farmers (5 Acres & more):** Recorded a notable 16.3% decrease in interest payments, reflecting favorable borrowing conditions or effective loan management strategies.
- **Overall:** Bihar's overall interest payments decreased by 4.3%, indicating varying impacts of interest rate changes across different farmer categories.

These trends highlight the complex interplay between interest rates, loan amounts, and agricultural financial management. The reduction in interest payments for medium and large farmers suggests improved affordability of loans or strategic refinancing options, potentially alleviating financial stress among these farmer categories.

Interest Rate Trends in Bihar

Table 7: Trends in The Interest Rate on Loan for Farmer in Bihar

Farmer_Category	2002-03	2018-19	Relative % Change
Marginal(< 1 Acre)	36.7	20.9	-43.1
Small (1-1.99 Acre)	24.7	18.4	-25.5

Farmer_Category	2002-03	2018-19	Relative % Change
Medium (2-4.99 Acre)	19.5	11.2	-42.6
Large (5 Acre & more)	15.6	8.6	-44.9
Overall	28.3	17.5	-38.2

The data is estimated by the author from SAS 2002-03 and SAS 2018-19.

Table 7 outlines the trends in interest rates on loans for different farmer categories in Bihar, reflecting changes in borrowing costs over the study period.

Interest Rate Trends Analysis

From 2002-03 to 2018-19:

- **Marginal Farmers (< 1 Acre):** Experienced a significant 43.1% decrease in interest rates, indicating improved access to cheaper credit or policy interventions targeting small farmers.
- **Small Farmers (1-1.99 Acre):** Saw a 25.5% decrease in interest rates, contributing to reduced borrowing costs and potentially increased borrowing capacity.
- **Medium Farmers (2-4.99 Acres):** Witnessed a substantial 42.6% decrease in interest rates, signaling improved affordability of loans for medium-sized agricultural operations.
- **Large Farmers (5 Acres & more):** Recorded a noteworthy 44.9% decrease in interest rates, facilitating more cost-effective borrowing for larger agricultural enterprises.
- **Overall:** Bihar's overall interest rates on agricultural loans decreased by 38.2%, reflecting broader policy initiatives or market-driven changes benefiting agricultural borrowers.

These trends suggest proactive measures by financial institutions or government policies aimed at reducing the cost of credit for farmers. Lower interest rates contribute to enhanced financial stability, increased investment capacity in agricultural inputs, and improved profitability, thereby supporting sustainable agricultural development.

Socio-Economic Interpretation

The observed trends in farmer's indebtedness, annual interest burden, and interest rate patterns in Bihar underscore significant shifts in the financial landscape of agricultural households. The increase in debt burden, coupled with varying trends in interest payments and rates, reflects both the challenges and opportunities within Bihar's agricultural sector.

The relative increase in debt burden across all farmer categories points to the growing financial pressures faced by farmers in sustaining agricultural operations and meeting household needs. However, the decrease in interest payments and interest rates indicates positive developments in financial accessibility and affordability, potentially easing the overall financial burden on agricultural households.

Policy implications include the need for continued support for affordable credit schemes, targeted financial literacy programs, and investments in agricultural infrastructure to enhance productivity and income stability. These measures can help mitigate the adverse impacts of debt accumulation while promoting sustainable agricultural growth and rural development in Bihar.

In conclusion, analyzing these financial metrics provides critical insights into the evolving economic conditions of Bihar's farming community. By understanding these trends, policymakers and stakeholders can formulate informed strategies to address challenges and capitalize on opportunities for enhancing farmer welfare and agricultural productivity in the region.

Conclusion of the Study

This study provides a comprehensive analysis of the economic well-being and indebtedness of farmers in Bihar from 2002-03 to 2018-19. The findings indicate significant shifts in landholding patterns, with a rise in the proportion of marginal and small farmers, alongside a decline in medium and large holdings. Credit accessibility improved, yet the prevalence of indebtedness remained high across all landholding sizes, with a notable increase in the debt burden. Income trends reveal positive growth in agricultural and overall earnings, although disparities persist among different farmer categories. Consumption expenditure surged, reflecting improved living standards but also highlighting growing financial pressures. Despite advancements in income and credit access, the enduring high levels of debt underscore the need for targeted financial support and sustainable agricultural policies to ensure long-term economic stability for Bihar's farming community. These insights are crucial for policymakers aiming to address the socio-economic challenges faced by farmers in the region.

Bibliography

- Shekhawat, S., & Kumari, O. (2023). Debt's Double-Edged Scythe: Assessing Farmer's Indebtedness on Sustainability. *KIMI Journal of Management and Economics*, 8(20), 831-838.
- Kannan, E., & Pohit, S. (2014). Agricultural Growth Diagnostics: Identifying the Binding Constraints and Policy Remedies for Bihar, India. *Agricultural Economics Research Review*.
- Singh, R. K. P., Singh, K. M., Kumar, A., Meena, Jha, A. K., & Kumar, A. (2013). Dimensions of Rural Poverty in Bihar: A Village Level Study. *National Seminar on "Emerging Challenges in Indian Agriculture"*.
- Kumari, N., & Badal, P. S. (2020). Socio-Economic Conditions of Farmers in Rice-Fallow Area of Bhagalpur District of Bihar, India. *International Journal of Current Microbiology and Applied Sciences*, 9(2), 144. <https://doi.org/10.20546/ijemas.2020.902.144>.
- Singh, K. M., Singh, R. K. P., Kumar, A., Meena, M. S., & Shahi, B. (2014). Agricultural Scenario and Strategies for Development: The Case of Bihar. *International Journal of Agricultural Sciences*, 10(1), 331-336.
- Datta, S., Tiwari, A. K., & Shylajan, C. S. (2018). An Empirical Analysis of Nature, Magnitude, and Determinants of Farmers' Indebtedness in India. *Agricultural Economics Research Review*, 30(conf), 111-120.
- Kumar, A., Singh, K. M., Singh, R. K. P., & Kumar, A. (2017). Dynamics of Income in Bihar: Evidence from Village Studies. *Indian Journal of Agricultural Economics*, 72(conf), 301.
- Kumar, A., Singh, R. K. P., Kumar, A., Kumar, U., Jha, A. K., & Kumar, P. (2019). Dynamics and Determinants of Farm Household Income in Bihar: Evidence from Panel Data of Selected Villages. *Indian Journal of Agricultural Economics*, 73(conf), 323.
- Maurya, S. K., & Vishwakarma, N. (2021). Status of Agricultural Credit and Indebtedness in India: An Analysis. *Indian Journal of Economics and Business*, 20(1), 113-128.
- Pandey, A. K., & Sanjeev, P. S. (2019). Assessing the Perpetuity of Tribe Indebtedness: An Empirical Study. *International Journal of Humanities and Social Science Invention*.