



# The changing fortunes of Odisha's farmers: a comparative analysis of indebtedness and economic status (2002-2019)

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## Abstract

This study examines the evolution of landholding patterns, credit access, income, consumption expenditure, and indebtedness among farmers in Odisha from 2002-03 to 2018-19 using NSSO's Situation Assessment Surveys (SAS) data. It reveals a significant increase in marginal farmers and a decrease in larger landholdings, reflecting land fragmentation. Credit access has notably improved, with the percentage of loanee families rising from 47.8% to 61.2%. Despite a 91.3% increase in agricultural income, consumption expenditure grew faster than income, indicating rising living costs. Debt levels also increased by 53.3%, though interest rates declined, suggesting improved credit conditions. The study highlights positive trends in financial inclusion and income but underscores the ongoing challenges of managing rising living costs and debt. It calls for targeted policies to enhance economic stability and living standards for small and marginal farmers in Odisha.

**Keywords:** landholding patterns, credit access, income trends, consumption expenditure, indebtedness

## Introduction

The agricultural sector in India has undergone significant transformations in the past few decades, with a growing emphasis on modernization and technological advancements (Gaddam *et al.* 2022) <sup>[1]</sup>. However, the challenges faced by farmers, particularly small and marginal cultivators, have persisted, with issues like indebtedness and economic instability remaining prominent (Maurya and Vishwakarma 2021) <sup>[2]</sup>. Odisha, a state in eastern India, has been considered a key.

Farmers in Odisha, like in many other parts of India, often experience economic instability due to various factors. The dependency on monsoon rains, susceptibility to natural disasters, and fluctuating commodity prices exacerbate their financial insecurity (Bahinipati and Venkatachalam 2015) <sup>[3]</sup>. Indebtedness among farmers has emerged as a significant concern, with many farmers relying on loans to manage agricultural expenses, invest in technology, or cope with crop failures (Ramprasad 2018) <sup>[4]</sup>. The burden of debt not only affects their current economic well-being but also has long-term implications for their ability to invest in their farms and improve productivity.

This study is significant as it aims to provide a comprehensive analysis of these issues, offering insights into the effectiveness of past and present agricultural policies. By examining the changes in landholding patterns, income levels, and indebtedness, this research seeks to contribute to a deeper understanding of the socio-economic challenges faced by farmers in Odisha.

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## Significance of the selected time period (2002-2019)

The period from 2002 to 2019 is particularly noteworthy due to several reasons. This timeframe saw the implementation of major economic reforms and agricultural policies designed to enhance agricultural productivity and farmer welfare. Initiatives such as the introduction of more efficient irrigation methods, improved access to credit, and the promotion of modern agricultural techniques were aimed at transforming the agricultural landscape of Odisha.

Moreover, this period witnessed significant natural disasters, including cyclones and floods, which had profound impacts on agricultural productivity and farmer livelihoods (Bahinipati and Venkatachalam 2013) <sup>[5]</sup>. The increasing frequency and intensity of these events, compounded by the effects of climate change, underscore the importance of studying their impact on farmers' economic conditions.

Technological advancements in agriculture during this period, such as the adoption of high-yield crop varieties and improved farming practices, also played a crucial role in shaping the economic outcomes for farmers. Understanding the extent to which these technologies were adopted and their impact on farm productivity is essential for evaluating the success of agricultural interventions.

The availability of comprehensive data sets, such as those from the National Sample Survey Office (NSSO) for the years 2002-03 and 2018-19, provides a robust basis for comparative analysis (Singh and Singh 2024) <sup>[6]</sup>. These data sets enable a detailed examination of trends and changes in landholding patterns, income, and indebtedness among farmers over the selected period.

## Literature review

### Changes in landholding patterns and credit accessibility

Research on agricultural practices and economic conditions in Odisha reveals significant shifts in landholding patterns and credit accessibility among farmers over the past two decades. Bahinipati and Venkatachalam (2013) <sup>[5]</sup> examined the determinants of farm-level adaptation practices to climate extremes in Odisha, highlighting the role of landholding size in influencing farmers' ability to implement adaptive measures. Their study indicated that larger landholders were better positioned to invest in climate-resilient technologies due to greater access to financial resources.

Further exploration by Bahinipati and Venkatachalam (2015) <sup>[3]</sup> provided empirical evidence on what drives farmers to adopt adaptation practices in response to climate extremes. The findings underscored the critical importance of access to credit in enabling farmers to make necessary investments in adaptive practices. This study is particularly relevant in understanding how changes in credit accessibility have influenced the capacity of farmers in Odisha to cope with environmental and economic challenges.

Maurya *et al.* (2021) <sup>[2]</sup> conducted a comprehensive analysis of agricultural credit and indebtedness in India, providing insights into the broader context of credit availability for farmers. Their research revealed that institutional credit plays a crucial role in supporting agricultural activities, but access to such credit remains unevenly distributed, with smaller farmers often facing significant barriers. This highlights the persistent issue of credit accessibility, which directly impacts landholding patterns and overall agricultural productivity.

### Trends in agricultural and overall income

The economic status of farmers in Odisha has been a focal point of numerous studies, reflecting both the agricultural income and overall household income trends. Nanda *et al.* (2020) <sup>[6]</sup> examined the status of food grain crops and the constraints faced in Southern Odisha, offering measures for enhancing production. Their study provided valuable insights into the productivity levels and income generation potential of different crops, emphasizing the need for improved agricultural practices and support systems to boost farmer incomes.

In their proposed model for agricultural marketing, Dash *et al.* (2020) <sup>[9]</sup> discussed the economic challenges and opportunities within Odisha's agricultural sector. They highlighted the potential for better market access and price realization as key factors in improving the overall income of farmers. This aligns with the broader objective of investigating income trends, as market dynamics significantly influence the financial well-being of farming households.

Gaddam *et al.* (2022) <sup>[1]</sup> focused on creating an optimal portfolio of crops using price forecasting to enhance the return on investment for Indian farmers. Their findings underscore the importance of strategic crop selection and market forecasting in maximizing agricultural income, which is essential for understanding the broader income trends among farmers in Odisha.

### Indebtedness among farmers of different landholding sizes

Indebtedness remains a critical issue for farmers, with significant variation observed across different landholding sizes. Ramprasad (2018) <sup>[4]</sup> explored the relationship between debt, vulnerability, and institutional factors in smallholder agriculture in South India. His study revealed that smaller farmers are disproportionately affected by debt due to limited access to institutional credit and reliance on informal lending sources. This research is pertinent for examining the indebtedness patterns among farmers in Odisha, where similar challenges are likely prevalent.

Singh and Singh (2024) <sup>[6]</sup> conducted a comparative analysis of the economic well-being and indebtedness of farmers in Bihar, offering parallels to the situation in Odisha. Their study highlighted the multifaceted nature of indebtedness, influenced by factors such as landholding size, access to credit, and income levels. These insights are crucial for understanding how indebtedness varies among different categories of farmers in Odisha and identifying potential measures to alleviate this burden.

Collectively, these studies provide a comprehensive understanding of the economic well-being and indebtedness of farmers in Odisha. They highlight the critical issues of landholding patterns, credit accessibility, income trends, and indebtedness, offering valuable insights that can inform policy formulation and support systems aimed at improving the livelihoods of farmers in the region. This literature forms the foundation for the present study, which seeks to analyze these dynamics over the period from 2002 to 2019, providing a detailed comparative analysis of the changing fortunes of Odisha's farmers.

### Objective of the study

- Analyze changes in landholding patterns and credit accessibility among farmers in Odisha from 2002-03 to 2018-19.
- Investigate the trends in agricultural and overall income for farmers in Odisha
- Examine indebtedness among farmers of different landholding size in Odisha

### Research methodology of the study

#### Data source

The primary data for this study comes from two comprehensive surveys conducted by the National Sample Survey Office (NSSO), under the Ministry of Statistics and Program Implementation, Government of India. These surveys, the Situation Assessment Survey (SAS) of Farmer Households (2003) and the Situation Assessment Survey of Agricultural Households (2019), offer a robust basis for analyzing the economic conditions of farmers in Odisha over the selected period.

The 59th round of the Situation Assessment Survey, carried out in 2003, aimed to evaluate the living standards of the farming community. This survey encompassed various aspects, including consumer expenditure, income, productive assets, indebtedness, farming practices, resource availability, and

access to modern technology in agriculture. Conducted solely in rural areas, it utilized a stratified multi-stage design, sampling approximately 51,770 farmer households across 6,638 villages in India. For Odisha, the survey included a sample of 1,938 farmer families, representing a total population of 10,045 individuals.

The 77th round of the Situation Assessment Survey, conducted from January to December 2019, introduced an integrated schedule combining the Land and Livestock Holding Surveys (LHS) with the Situation Assessment Survey of Agricultural Households. This survey generated indicators on ownership and operational holdings, livestock ownership, income, productive assets, indebtedness, farming practices, awareness of technological developments, and the economic activities of agricultural households. Data was collected in two visits from the same set of sample households, covering the agricultural year from July 2018 to June 2019. In Odisha, the survey included a sample of 1,989 farmer families who met the criteria of active agricultural households, representing a total population of 8,516 individuals.

**Comparability issues**

A major challenge in comparing the 59th (2003) and 77th (2018-19) rounds of the SAS is the differing definitions and methodologies. In 2003, a "farmer household" was defined as having at least one member with some land engaged in

agricultural activities over the past year. In 2018-19, an "agricultural household" was defined as one that earned over Rs. 4000 from agricultural activities in the past year and had at least one member self-employed in agriculture. Despite these differences, macro-level comparisons still provide valuable insights into agricultural trends. For this study, "farmer family" and "agricultural household" are used interchangeably.

**Inflation adjustment for income comparison**

To compare agricultural incomes from 2002-03 and 2018-19, we adjusted for inflation using the 2016-17 base year. We retrieved Consumer Price Index (CPI) data from the Reserve Bank of India and converted the CPI values from the 1986-87 base year to the 2016-17 base year.

For example, the CPI was 319 in 2002-03 and 907 in 2018-19, with a base year CPI of 870 for 2016-17. These adjusted CPI values enabled us to convert nominal incomes from both years to real terms, providing a clearer comparison of economic changes over time.

**Analysis of the study**

**Landholding patterns and credit accessibility among farmers**

The analysis of farmer landholding and credit access in Odisha over the period from 2002-03 to 2018-19 reveals significant changes in both landholding patterns and credit accessibility.

**Table 1:** Odisha 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)	1,790,428	42.3	0.4	46.1
	Small (1-1.99 Acre)	1,182,290	27.9	1.4	44.9
	Medium (2-4.99 Acre)	974,510	23.0	2.9	52.6
	Large (5 Acre & more)	286,892	6.8	7.5	54.2
	Overall	4,234,120	100.0	1.7	47.8
2018-19	Marginal (< 1 Acre)	2,350,213	48.8	0.3	61.1
	Small (1-1.99 Acre)	1,637,702	34.0	1.5	59.2
	Medium (2-4.99 Acre)	684,856	14.2	2.9	62.8
	Large (5 Acre & more)	142,538	3.0	7.4	77.2
	Overall	4,815,309	100.0	1.3	61.2

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

**Landholding patterns**

The proportion of marginal landholders (those owning less than 1 acre) increased from 42.3% in 2002-03 to 48.8% in 2018-19. This rise indicates a growing concentration of farming activities among households with very small landholdings. Conversely, the share of small landholders (owning 1 to 1.99 acres) declined from 27.9% to 34.0%, and medium landholders (owning 2 to 4.99 acres) also saw a decrease from 23.0% to 14.2%. The proportion of large landholders (owning 5 acres and more) significantly diminished from 6.8% to 3.0%. These shifts reflect a trend towards smaller landholdings, likely driven by land fragmentation and the increasing difficulty in acquiring and maintaining larger tracts of agricultural land.

**Average landholding**

The average landholding size among agricultural families saw

a slight reduction from 1.7 acres in 2002-03 to 1.3 acres in 2018-19. This decrease is indicative of the broader trend towards smaller landholdings. Despite the overall land area per household decreasing, the average size of marginal and small landholdings remained relatively stable, while medium and large landholdings became less common. This reduction in average landholding size may be attributed to increased population pressure on land and the fragmentation of agricultural plots over time.

**Credit access**

Credit accessibility among different landholding categories also experienced notable changes. The percentage of loanee families increased across all landholding categories, with marginal landholders experiencing the most substantial rise from 46.1% in 2002-03 to 61.1% in 2018-19. Small

landholders saw an increase from 44.9% to 59.2%, medium landholders from 52.6% to 62.8%, and large landholders from 54.2% to 77.2%. The overall percentage of loanee families rose from 47.8% to 61.2%. This widespread increase in credit access can be attributed to improved financial inclusion measures, government initiatives to promote agricultural credit, and increased financial literacy among farmers.

### Socio-economic interpretation

The observed trends highlight a shift towards smaller landholdings, likely driven by socio-economic factors such as population growth, land fragmentation, and economic pressures on farming families. The increase in the proportion of marginal landholders suggests a need for targeted support to these small-scale farmers, who face the greatest challenges due to their limited land resources. The rise in credit access across all landholding categories points to positive developments in financial inclusion, though it is essential to ensure that increased credit availability translates into meaningful economic benefits for farmers. Improving access to credit for smaller and marginal landholders remains crucial, as these farmers are more vulnerable to financial instability. Overall, the data reflects a need for policies that address the challenges associated with small landholdings and continue to support the financial inclusion of farmers in Odisha.

### Trends in farmer income and consumption expenditure in Odisha

#### Analysis of agricultural income

Table 2 provides data on annual earnings from agricultural activities among different farmer categories in Odisha for the years 2002-03 and 2018-19. The data reveals substantial variations in income growth across different landholding categories.

For marginal farmers (owning less than 1 acre), agricultural income increased from ₹6,026 in 2002-03 to ₹8,973 in 2018-19, representing a relative growth of 48.9%. This modest increase indicates that while marginal farmers have seen some growth in their agricultural earnings, the rise is relatively limited, reflecting constraints in agricultural productivity or land limitations.

Small farmers (owning 1 to 1.99 acres) experienced a dramatic rise in agricultural income, from ₹6,809 to ₹19,779, marking a 190.5% increase. This significant growth suggests that small farmers have likely improved their agricultural practices or benefited from better market conditions, leading to a considerable increase in their earnings.

Medium farmers (owning 2 to 4.99 acres) saw their agricultural income grow from ₹14,014 to ₹37,707, an increase of 169.1%. This growth reflects improvements in productivity or market access for medium-sized landholdings.

Large farmers (owning 5 acres or more) had their income rise from ₹28,310 to ₹63,552, a 124.5% increase. Although the growth rate is lower compared to smaller farmers, the absolute income levels are significantly higher, suggesting that large farmers are benefiting from economies of scale.

Overall, the average agricultural income increased from ₹9,593 to ₹18,350, a 91.3% rise. This general upward trend indicates improvements in agricultural productivity or market conditions but also highlights the varying impacts across different landholding sizes.

**Table 2:** Farmer's annual earnings from agricultural activities in Odisha

Farmer Category	2002-03	2018-19	Relative % Change
Marginal (< 1 Acre)	6,026	8,973	48.9
Small (1-1.99 Acre)	6,809	19,779	190.5
Medium (2-4.99 Acre)	14,014	37,707	169.1
Large (5 Acre & more)	28,310	63,552	124.5
Overall	9,593	18,350	91.3

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

#### Analysis of gross income

Table 3 shows the total annual earning levels, including both agricultural and non-agricultural sources, across different farmer categories.

For marginal farmers, the total income rose from ₹27,604 in 2002-03 to ₹44,971 in 2018-19, an increase of 62.9%. This growth is lower compared to their agricultural income increase, indicating that while marginal farmers have improved their agricultural earnings, their overall income growth is tempered by limited non-agricultural earnings.

Small farmers saw their total income rise from ₹28,848 to ₹67,007, a 132.3% increase. This significant rise reflects not only improved agricultural earnings but also the potential involvement of family members in non-agricultural activities such as wage labor or small businesses, contributing to overall income growth.

Medium farmers experienced a 107.6% increase in total income, from ₹36,553 to ₹75,893. This growth mirrors their substantial increase in agricultural income and suggests a robust improvement in both agricultural and non-agricultural earnings.

Large farmers saw their total income grow from ₹66,395 to ₹152,900, an increase of 130.3%. This substantial rise reflects significant gains in agricultural income and possibly higher involvement in profitable non-agricultural activities.

The overall average income increased from ₹32,639 to ₹60,059, an 84.0% rise. This trend reflects improvements in both agricultural and non-agricultural income sources, contributing to overall economic growth among farmers.

**Table 3:** Farmer household annual earning level in Odisha

Farmer category	2002-03	2018-19	Relative % change
Marginal (< 1 Acre)	27,604	44,971	62.9
Small (1-1.99 Acre)	28,848	67,007	132.3
Medium (2-4.99 Acre)	36,553	75,893	107.6
Large (5 Acre & more)	66,395	152,900	130.3
Overall	32,639	60,059	84.0

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

## Annual consumption expenditure trends in Odisha

**Table 4:** Farmer household annual consumption expenditure trend Odisha

Farmer_Category	2002-03	2018-19	Relative % change
Marginal (< 1 Acre)	23,751	59,466	150.4
Small (1-1.99 Acre)	23,195	56,514	143.6
Medium (2-4.99 Acre)	22,876	58,551	155.9
Large (5 Acre & more)	29,334	78,318	167.0
Overall	23,773	58,890	147.7

The consumption expenditure is 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 details the annual consumption expenditure trends for farmers, focusing on out-of-pocket expenses for non-durable goods.

Marginal farmers' consumption expenditure increased from ₹23,751 in 2002-03 to ₹59,466 in 2018-19, a rise of 150.4%. This significant increase reflects higher living costs and possibly increased access to consumer goods, despite the modest growth in agricultural income. The rise in consumption expenditure is notably higher than the growth in agricultural income, suggesting that marginal farmers are spending more on non-durable goods, potentially indicating higher costs of living or improved access to consumer markets.

Small farmers saw their consumption expenditure grow from ₹23,195 to ₹56,514, a 143.6% increase. Similar to marginal farmers, the consumption expenditure growth outpaces the increase in agricultural income, suggesting that small farmers are spending a larger portion of their income on non-durable goods.

Medium farmers experienced a consumption expenditure increase from ₹22,876 to ₹58,551, a 155.9% rise. This significant increase indicates higher spending on consumer goods, which could be attributed to higher income or changing consumption patterns.

Large farmers' consumption expenditure grew from ₹29,334 to ₹78,318, a 167.0% increase. The substantial rise in consumption expenditure among large farmers indicates not only higher income but also possibly a shift towards more consumer-oriented lifestyles.

Overall, consumption expenditure rose from ₹23,773 to ₹58,890, reflecting a 147.7% increase. The rise in consumption expenditure outpaces the growth in agricultural income, suggesting that farmers are allocating a larger portion of their income to non-durable goods, which may be a response to increased living costs or improved standards of living.

### Interpretation of trends

The trends in income and consumption expenditure for farmers in Odisha from 2002-03 to 2018-19 reveal significant shifts. While agricultural incomes have generally increased, the rate of growth varies by landholding size. Smaller and medium farmers have experienced higher relative income growth, indicating improvements in their agricultural practices or market conditions.

However, consumption expenditure has grown at a faster rate than agricultural income across all landholding categories. This discrepancy suggests that while farmers are earning more, their spending on non-durable goods has increased significantly, possibly due to rising living costs or changing consumption patterns.

The greater rise in consumption expenditure compared to agricultural income points to a broader economic trend where increased earnings are being spent on consumer goods, reflecting improved access to markets and higher living standards. For marginal and small farmers, the increased expenditure on non-durable goods could indicate a shift towards higher consumption or the impact of rising costs of living.

Overall, these trends highlight the need for targeted policies that address the challenges faced by farmers, particularly those with smaller landholdings, and ensure that income growth translates into improved living standards and economic stability.

### Trends of indebtedness and its burden on farmer in Odisha

Access to affordable credit is crucial for farmers, as it provides the necessary financial resources for investment in agricultural inputs, technological advancements, and overcoming seasonal income fluctuations. Loans enable farmers to improve productivity, manage risks, and expand their operations. However, the burden of high-interest rates can significantly impact the economic well-being of farmers, particularly those with limited financial resources. Affordable credit is essential to ensure that all categories of farmers, from marginal to large, can sustain and enhance their agricultural activities.

### Trends in indebtedness

Table 5 presents data on the debt burden of indebted farmers across different landholding categories in Odisha for the years 2002-03 and 2018-19.

For marginal farmers, the average debt increased from ₹26,944 in 2002-03 to ₹47,928 in 2018-19, reflecting a substantial 77.9% rise. This significant increase indicates that marginal farmers, who typically operate with minimal land and resources, have faced escalating debt levels. The rise in debt could be attributed to increasing costs of agricultural inputs, lower income from farming activities, and the rising need for credit to sustain their agricultural practices.

Small farmers experienced a 38.0% increase in their average debt, from ₹36,574 to ₹50,461. While this rise is less dramatic than that of marginal farmers, it still signifies a considerable burden. The relative increase in debt for small farmers could be due to similar reasons—higher costs, reduced income, and greater reliance on credit.

Medium farmers saw their debt rise by 59.6%, from ₹32,744 to ₹52,275. The increase in debt among medium-sized landholders suggests that even those with larger landholdings are facing financial pressures, possibly due to investments in technology, increased operational costs, or lower-than-expected returns on agricultural produce.

Large farmers, with the highest absolute debt levels, saw their average debt increase from ₹59,931 to ₹99,354, a rise of 65.8%. The substantial debt burden for large farmers can be linked to large-scale investments in modern agricultural practices, expansion of operations, or financial pressures related to market conditions.

Overall, the average debt for all farmers rose by 53.3%, from ₹33,474 to ₹51,317. This increase reflects a broader trend of growing indebtedness across all landholding categories in Odisha.

**Table 5:** Debt burden on indebted farmer in Odisha

Farmer Category	2002-03	2018-19	Relative % Change
Marginal (< 1 Acre)	26,944	47,928	77.9
Small (1-1.99 Acre)	36,574	50,461	38.0
Medium (2-4.99 Acre)	32,744	52,275	59.6
Large (5 Acre & more)	59,931	99,354	65.8
Overall	33,474	51,317	53.3

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

### Trends in annual interest burden

Table 6 provides information on the annual interest paid by farmers across different categories.

For marginal farmers, the annual interest paid increased from ₹6,473 in 2002-03 to ₹9,048 in 2018-19, a rise of 39.8%. Although the interest burden has increased, the relative growth is lower compared to the rise in debt, indicating that the proportion of interest relative to the total debt has decreased.

Small farmers, however, saw a decrease in their annual interest payments, from ₹14,582 to ₹9,128, a reduction of 37.4%. This decline could be due to improved access to lower-interest loans, better debt management practices, or changes in the sources of credit.

Medium farmers experienced a slight decrease in their annual interest payments, from ₹6,176 to ₹5,549, a 10.2% reduction. This modest decline suggests that medium-sized farmers have managed their debt more effectively or benefitted from lower interest rates.

Large farmers saw a reduction in their annual interest payments, from ₹8,817 to ₹8,189, a decrease of 7.1%. Despite the decrease, large farmers still bear a significant interest burden, which could be attributed to their high levels of debt.

Overall, the average annual interest paid by farmers decreased slightly by 2.0%, from ₹8,705 to ₹8,531. This modest reduction suggests improvements in interest rates or better debt management but does not fully offset the increasing debt levels.

**Table 6:** Annual interest paid by farmer of Odisha

Farmer Category	2002-03	2018-19	Relative % change
Marginal (< 1 Acre)	6,473	9,048	39.8
Small (1-1.99 Acre)	14,582	9,128	-37.4
Medium (2-4.99 Acre)	6,176	5,549	-10.2
Large (5 Acre & more)	8,817	8,189	-7.1
Overall	8,705	8,531	-2.0

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

### Trends in interest rates

Table 7 shows the trends in the interest rates on loans for farmers.

For marginal farmers, the interest rate decreased from 24.0% in 2002-03 to 18.9% in 2018-19, a reduction of 21.3%. This decrease reflects an improvement in the affordability of credit for marginal farmers, which could be due to government interventions, increased competition among lenders, or better financial products.

Small farmers saw a significant reduction in their interest rates, from 39.9% to 18.1%, a drop of 54.6%. This dramatic decline indicates substantial improvements in credit access and affordability for small farmers, possibly due to targeted credit schemes or subsidized loans.

Medium farmers experienced a decrease in interest rates from 18.9% to 10.6%, a reduction of 43.9%. This drop reflects improved access to more affordable credit options, which may have helped medium farmers manage their debt more effectively.

Large farmers saw their interest rate decrease from 14.7% to 8.2%, a reduction of 44.2%. The lower interest rates for large farmers reflect enhanced access to financial products or favorable lending conditions.

Overall, the average interest rate for all farmers decreased from 26.0% to 16.6%, a reduction of 36.2%. This general decline in interest rates indicates improved credit conditions across the board, which has likely contributed to the observed trends in debt and interest payments.

**Table 7:** Trends in the interest rate on loan for farmer in Odisha

Farmer Category	2002-03	2018-19	Relative % change
Marginal (< 1 Acre)	24.0	18.9	-21.3
Small (1-1.99 Acre)	39.9	18.1	-54.6
Medium (2-4.99 Acre)	18.9	10.6	-43.9
Large (5 Acre & more)	14.7	8.2	-44.2
Overall	26.0	16.6	-36.2

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

The analysis of trends in farmer indebtedness, annual interest burden, and interest rates in Odisha reveals several key insights. Despite a general decline in interest rates, which has improved the affordability of credit, the debt burden on farmers has increased across all landholding categories. This suggests that while credit has become more affordable, the rising costs of agricultural inputs, lower incomes, and the need for greater financial resources have led to increased borrowing.

The reduction in annual interest payments for some categories of farmers indicates improved debt management or access to better credit products. However, the overall increase in debt levels highlights the persistent financial pressures faced by farmers.

The significant drop in interest rates, particularly for small and medium farmers, suggests positive developments in the credit market, potentially driven by policy interventions and increased competition. Nonetheless, the rising debt levels across all categories emphasize the need for continued efforts

to improve access to affordable credit and support the financial stability of farmers.

In conclusion, while there have been improvements in credit conditions, the increasing debt burden underscores the need for targeted financial support and effective debt management strategies to ensure sustainable agricultural development and economic stability for farmers in Odisha.

### Conclusion

This study provides a comprehensive analysis of the changes in landholding patterns, credit accessibility, income, consumption expenditure, and indebtedness among farmers in Odisha from 2002-03 to 2018-19, using data from the Situation Assessment Surveys (SAS) conducted by the National Sample Survey Office (NSSO).

The data reveals notable shifts in landholding patterns, with a significant increase in the proportion of marginal farmers (owning less than 1 acre) from 42.3% in 2002-03 to 48.8% in 2018-19. This trend indicates a growing concentration of farming activities among households with very small landholdings, likely due to land fragmentation and increasing difficulty in maintaining larger tracts of land. In contrast, the proportion of larger landholdings has decreased substantially, reflecting a broader trend towards smaller landholdings. Average landholding size also declined slightly from 1.7 acres to 1.3 acres, highlighting the ongoing pressure on land resources. On the credit front, there was a significant rise in credit access across all landholding categories, with the overall percentage of loanee families increasing from 47.8% to 61.2%. This improvement in credit accessibility suggests successful financial inclusion measures and increased support for agricultural credit.

Income trends indicate diverse growth patterns across different landholding categories. Marginal farmers experienced a modest increase in agricultural income, reflecting the constraints of limited land resources. Small and medium farmers saw substantial increases, suggesting improvements in agricultural practices and market conditions. Large farmers, while experiencing significant income growth, benefited from economies of scale. Overall, agricultural income increased by 91.3%, indicating positive developments in agricultural productivity and market conditions.

In terms of total income, which includes both agricultural and non-agricultural sources, all categories of farmers saw considerable increases. However, the growth in consumption expenditure outpaced income growth across all landholding categories. This discrepancy points to higher living costs or improved access to consumer goods. For marginal and small farmers, the increase in consumption expenditure suggests a shift towards higher consumption or the impact of rising costs of living.

The study also highlights rising indebtedness among farmers, with average debt increasing by 53.3% across all landholding categories. Marginal farmers experienced the most significant rise in debt, reflecting their limited resources and higher financial pressures. Despite increases in debt, there was a general decline in interest rates on loans, which improved

affordability for farmers. Notably, interest rates decreased across all categories, indicating better credit conditions and possibly contributing to the observed trends in debt and interest payments.

Overall, the data underscores the need for targeted policies that address the challenges faced by small and marginal farmers and ensure that improvements in credit access and income growth translate into better living standards and economic stability. The findings suggest a positive trajectory in financial inclusion and economic conditions for farmers in Odisha, but also highlight ongoing challenges, particularly in managing rising living costs and debt burdens.

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