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# Determinants and Constraints of Credit Flow to the Agriculture Sector in Odisha

National Institute of Technology, Rourkela

आर्थिक विश्लेषण एवं अनुसंधान विभाग
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# Determinants and Constraints of Credit Flow to the Agriculture Sector in Odisha

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DISCLAIMER

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# Determinants and Constraints of Credit Flow to the Agriculture Sector in Odisha
## About NABARD Research Study Series

The NABARD Research Study Series has been started to enable wider dissemination of research conducted/sponsored by NABARD on the thrust areas of Agriculture and Rural Development among researchers and stakeholders. The study titled 'Determinants and Constraints of Credit Flow to the Agriculture Sector in Odisha' completed by National Institute of Technology, Rourkela is the fifty-fourth in the series.

Agriculture forms the backbone of rural economies, providing livelihoods to millions while ensuring food security for the nation. However, for farming to thrive, access to timely and adequate credit is indispensable. In Odisha, where agriculture is a primary occupation, the availability and utilization of institutional credit remain key factors in determining farm productivity and rural economic growth. Despite various government initiatives and financial schemes, small and marginal farmers often face constraints in accessing credit due to socio-economic barriers, institutional bottlenecks, and financial illiteracy.

This study aims to explore the determinants that influence agricultural credit flow and the constraints that hinder farmers from obtaining financial support. Conducted across ten districts of Odisha, covering 25 blocks, 94 Gram Panchayats, and 116 villages, the study captures the perspectives of both loanee and non-loanee farmers. The research adopts a mixed-method approach, utilizing both primary data from farmers and financial institutions, along with secondary data analysis, to provide a holistic understanding of the credit landscape. Key issues such as interest rates, loan processing delays, collateral requirements, and gender disparities in credit access are examined in detail.

The findings of this study are intended to serve as a valuable resource for policymakers, financial institutions, and agricultural stakeholders in their efforts to improve credit accessibility. By identifying the existing challenges and proposing targeted interventions, this research aims to contribute towards a more inclusive financial ecosystem that empowers farmers and strengthens the agricultural sector in Odisha.

Hope this report would make a good reading and help in generating debate on issues of policy relevance. Let us know your feedback.

**Kuldeep Singh Chief**
**General Manager**
**Department of Economic Analysis and Research**

# PREFACE

In the survey we endeavoured to bring different perspectives from the loanee and non-loanee farmers, covering ten districts, 25 blocks, 94 Gram Panchayats and 116 villages of the tribal areas of Odisha. The total sample size of the respondents was 1036. The facts stated in the study are unadulterated and straight from the horse mouth about the farmer's determinants and constraints credit access scheme in Odisha. The project is divided into six chapters. The first chapter is the introduction and objectives. The second chapter deals with the literature review. The third chapter deals with the methodology adopted for tabulating the questionnaire. The fourth chapter is a tabulation and analysis on the socio-economic and farm characteristics of sample households of the respondents collected from the primary survey. The fifth chapter again is a tabulation and analysis of the determinants and constraints of credit related to the farmers based on the primary survey. The sixth chapter consists of primary data collected from bankers working in financial institutions about the role of credit disbursement. The last chapter is conclusion that focuses on the Policy Implications and Recommendation.

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# Executive Summary

Financial inclusion is essential for boosting economic growth and reducing inequality between disadvantaged and privileged sections of society. A significant portion of the Indian economy relies on the agricultural sector, making its growth essential. The agricultural sector's productivity is contingent on several factors, including credit availability, farmers' social and demographic characteristics, and climatic conditions. Credit availability is one of the essential indicators because small and marginal farmers cannot finance their agricultural activity. Ordered probit regression model with sample selection was used to analyse the primary data. This study aims to identify various obstacles that limit farmers' access to credit and various influencing factors. This study was conducted in various tribal districts of Odisha. The implications of the study are to identify and recommend solutions to solve the credit demand and supply problems faced by farmers and financial institutions and to assist governments in implementing and modifying new and existing schemes that help farmer's access to credit.

**Keywords:** Financial inclusion, agricultural credit, ordered probit regression with selection model.

## Objectives of the Study:

1. To analyse various indicators that affect the credit flow to the agriculture sector.
2. To analyse credit constraints faced by the farmer.
3. To examine the role of financial institutions on agricultural credit.

## Methodology used for the field Survey:

- The study adopts both primary and secondary data to carry out the objectives of the study. Primary data is gathered from ten tribal districts of the state, namely Balasore, Sundergarh, Koraput, Keonjhar, Sambalpur, Mayurbhanj, Malkangiri, Gajapati, Kalahandi and Nabrangpur. 25 blocks were selected from the ten districts, 94 Gram panchayats and 116 villages were covered in the survey. As per the given methodology,

1036 sample farmers are selected from each sample district based on a purposive sampling method.

- Farmers are interviewed with 38 questions with a semi-structured questionnaire consisting of both closed-ended and open-ended questions to cater to the first and second objective.
- Two categories of farmers were interviewed; loanee farmers who availed agricultural credit and non-loanee farmers who have not availed the credit.
- The study uses dummy variables and ordinal variable for selection and outcome equations respectively. Hence, the study used an ordered probit model with sample selection to identify agricultural credit determinants in the state of Odisha.
- Further, the study has used simple descriptive statistics, ANOVA, Chi-square test to analyse the demographic characteristics, determinants and constraint level factors impacting the agricultural credit access by farmers. Moreover, the study analysed whether any differences exist in the factors like income, education, caste and district on the various credit constraints experienced by people who have availed credit in the sample. All the analysis was undertaken with EXCEL and STATA software packages.
- Another schedule was circulated to gather primary data from 35 bankers working in financial institutions about the role of banks in credit disbursement. This was to cater to the third objective.

## Key findings of the study:

### 1. Status of Credit Access in overall Odisha

- Odisha's diverse agro-climatic zones support a variety of crops, with rice being the predominant one. The state faces challenges from natural calamities like cyclones, floods, and droughts. Efforts to promote climate-resilient farming, improve irrigation, and introduce resilient crop varieties have boosted productivity.
- **Credit Growth:** Agricultural credit in Odisha has increased due to government schemes like the Kisan Credit Card (KCC); however small and marginal farmers still face difficulties in accessing formal credit.
- **Key Initiatives**
  - Biju Krushak Kalyan Yojana (BKKY): Provides health insurance to farmers.

- Odisha Millet Mission: Promotes millet cultivation and consumption for nutritional security and income.

**2. Socio-Economic Conditions of Farmers in Tribal areas of Odisha**

- **Predominance of Marginal and Small Farmers**
  - Over 80 per cent of farmers in Odisha fall into the marginal or small farmer category.
  - Approximately 90 per cent of these farmers rely solely on agriculture as their primary source of income, without any secondary source of livelihood.
- **Credit Availability**
  - Districts like Koraput, Nabrangpur, and Sundergarh have a higher number of farmers who have not availed agricultural credit. In Nabrangpur, education levels are notably low, with nearly 75% of farmers having less than primary level education.
- **Gender Disparities in Farming and Income**
  - Districts with a higher proportion of women farmers tend to experience lower income levels. For example, in Mayurbhanj, where women represent 85% of the farming population, incomes are clustered around the low-income level.
  - In Malkangiri, the high presence of marginal farmers is significantly contributed by female farmers.
- **Impact of Male Farmer Representation on Income**
  - Districts such as Sambalpur, Balasore, Gajapati, and Kalahandi, where male farmers are more prevalent, tend to have higher income levels.
  - Specifically, in Kalahandi, around 63% of farmers belong to an income group above Rs. 2 lakhs, indicating a higher income level compared to other regions.
- **Higher Income in Non-SC/ST Classes**
  - In Balasore, about 95% of farmers belong to classes other than SC (Scheduled Caste) and ST, experiencing higher education levels and better income distribution.
  - Despite Gajapati having a significant representation of ST farmers, most semi-medium farmers belong to other classes and have higher income levels.
- **Diverse Social Composition and Income**
  - The people in the socially backward class are more coming under the marginal farmer category and experience lower income levels mostly.

- In Keonjhar, many farmers belong to the ST (Scheduled Tribe) category and are marginalized.
- Malkangiri has a comparatively higher presence of SC farmers, with farmers distributed among SC, ST, and other categories. The income distribution in Malkangiri remains an issue, with most farmers earning less than Rs. 50,000 or between Rs. 50,000 and Rs. 1 lakh.

**3. Agricultural Credit: Determinants & Constraints:**

- **Determinants of Credit Access**:
  - Education and Engagement: Primary and secondary level education, along with participation in Krishi Mela, positively influence farmers' decisions to take agricultural credit.
  - KCC Benefits: The Kisan Credit Card (KCC) scheme not only facilitates the decision to take credit but also enhances the borrowing capacity, leading to higher credit amounts.
  - Distance and Perception: Greater distances to financial institutions and farmers' perceptions of high interest rates negatively impact their decisions to take loans.
  - Socioeconomic Factors: Farmers from Scheduled Tribe (ST) backgrounds may experience reduced borrowing amounts due to socio-economic challenges.
  - Gender Dynamics: Male farmers are less likely to borrow higher amounts compared to female farmers, suggesting gender differences in credit access or needs.
  - Family Size: A larger family size negatively affects the amount of agricultural credit accessed, likely due to higher financial burdens and divided resources.
  - Resource Availability: The size of the operated area, the value of land, and the presence of farming equipment significantly enhance a farmer's creditworthiness and potential to borrow larger sums.
  - Household Income: Higher annual household incomes improve farmers' borrowing capacity, enabling them to secure more substantial loans.
  - Diverse Financing: Farmers accessing credit from multiple sources, including cooperatives, tend to secure larger loans, underscoring the benefits of diversified financial engagements.
- **Constraints to agricultural credit access**

- High Interest Rates: The major constraint reported by farmers is the exorbitant interest rates charged on agricultural credit, as 90 per cent of the farmers accessing agricultural credit have reported the same.
- Absence of Bribery: Positively, none of the farmers had to give bribes to officers to obtain agricultural credit, indicating a level of integrity and efficiency in the bureaucratic system.
- Mortgage Requirements: The requirement of a mortgage is a major constraint for farmers in the districts of Sambalpur, Mayurbhanj, and Keonjhar.
- Issues with Group Lending: Group lending is problematic in most districts, serving as a significant constraint due to increased individual risk and frequent group disagreements.
- Cumbersome Bank Procedures: Farmers in Sundergarh district face issues like cumbersome bank procedures, delays in loan disbursement, and individual collateral requirements.
- Insufficient Loan Amounts: Farmers in Kalahandi, Balasore, and Sundergarh have reported receiving loan amounts that are less than what they applied for.
- Factors impacting Credit constraints: There is significant district disparities for all the constraints indicating the district wise differences play a crucial role in the agricultural related credit constraints faced by farmers. Education levels are another significant factor impacting all the constraints while caste is only significantly impacting the non-receipt of applied amount. Income levels are significantly affecting non-receipt of applied amount and group lending constraints, while have a weak significance in case of requirement of a mortgage.

## Suggestions:

- **Government Schemes and Subsidies**

  17.1 % of the bankers revealed government schemes play a crucial role in supporting farmers and enhancing their access to credit. These schemes provide financial resources, subsidies, and insurance which make it easier for farmers to secure loans and mitigate the risks associated with agricultural activities.

- **Credit Awareness and Education**

14.3 % of bankers suggested educating farmers about financial products and services can help them make better financial decisions and improve their creditworthiness. Educational initiatives, such as workshops and training sessions, are crucial for helping farmers understand and manage their finances effectively, thereby improving their ability to obtain and manage loans. Organizing credit camps or FLC (Financial Literacy Camps) in rural areas has proven to be an effective strategy for increasing credit awareness among farmers. These camps provide valuable information on available credit options, how to apply for them, and financial management practices.

- **Market Access and infrastructure**

11.4 % of bankers suggested improving market access and price stabilization measures as a measure to improve credit access. Ensuring farmers have access to markets and stable prices for their produce are essential for financial stability. Unstable market prices can lead to financial losses, affecting farmers' ability to repay loans. Providing infrastructure for better market access and implementing price stabilization measures can enhance farmers' financial security. Enhancing agricultural infrastructure, such as irrigation systems, storage facilities, and transportation networks, is critical. Better infrastructure reduces post-harvest losses and improves productivity, making farmers more capable of repaying loans.

- **Crop insurance**

Providing crop insurance and offering low-interest loans are common strategies that could help agricultural credit access as suggested by 11.4% bankers. These initiatives help mitigate risks associated with farming and make credit more accessible. Insurance schemes protect farmers from the financial impacts of crop failure due to adverse weather or pest attacks.

- **Creditworthiness and Non-Performing Assets (NPAs)**

According to 5.7% bankers, improving the creditworthiness of farmers and reducing NPAs are fundamental for increasing loan advances. Ensuring farmers have good credit ratings can significantly impact their eligibility for loans. Regular monitoring and support to improve financial management among farmers can lead to a decrease in NPAs.

- **Physical and Environmental Factors**

  As per 5.7% of bankers, the physical conditions of the land, such as terrain, soil fertility, and climate, significantly impact loan disbursement. Areas with favorable conditions are more likely to receive higher loan advances due to the perceived lower risk of crop failure.

- **Technological Advancements and Farm Mechanization**

  According to 8.6 % bankers, investments in technology, such as modern irrigation systems, high-yield seed varieties, and farm machinery, can improve farm outputs and make farmers more creditworthy.

- **Social and Institutional Support**

  Another 8.6 % bankers, the role of social and institutional support cannot be overlooked. Strong cooperative farmer associations and institutional frameworks can provide the necessary backing for farmers to access credit. Such support structures can also help in collective bargaining for better loan terms and conditions.

- **Prioritizing Specific Crops**

  5.7% of bankers were of the opinion that, prioritizing certain crops can lead to increased loan advances. Because most of the farmers are willingly taking credit for Kharif crop credits, but very few farmers, mostly having their own irrigation sources are taking loans for Rabi crops. Focusing on high-demand or high-value crops can enhance farmers' financial stability and creditworthiness, leading to better loan terms.

- **Offering Multiple Loan Products**

  8.6% bankers suggested offering a range of loan products tailored to different types of customers can address the diverse needs of farmers. This could include short-term loans for seasonal expenses, long-term loans for infrastructure development, and microloans for small-scale farmers. By diversifying loan products, banks can better meet the specific financial needs of various farmers, enhancing overall credit accessibility. Providing subsidized loans is another crucial strategy for increasing loan advances to agriculture farmers. Subsidized loans can reduce the financial burden on farmers by lowering interest rates and providing more favorable loan terms. These loans can be particularly beneficial in times of financial distress or for financing essential agricultural inputs.

# List of Abbreviations

**APBS**: Aadhaar Payments Bridge System

**ATM**: Automated Teller Machine

**BOI**: Bank of India

**CGAP**: Consultative Group to Assist the Poor

**COVID-19**: Coronavirus Disease 2019

**CSP**: Customer Service Points

**DAFW**: Department of Agriculture and Farmers Welfare

**DFS**: Digital Financial Services

**e-NAM**: National Agriculture Market

**FAO**: Food and Agriculture Organization

**FI**: Financial Inclusion

**FII**: Financial Inclusion Index

**FLC**: Financial Literacy Camp

**FPO**: Farmer Producer Organizations

**G20**: Group of Twenty

**GDP**: Gross Domestic Product

**ICT**: Information and Communication Technology

**IFC**: International Finance Corporation

**IMF**: International Monetary Fund

**JLG**: Joint Liability Group

**KCC**: Kisan Credit Card

**KYC**: Know Your Customer

**LDM**: Lead District Manager

**LT**: Long Term

**MFI**: Microfinance Institution

**MSME**: Micro, Small, and Medium Enterprises

**MSP**: Minimum Support Price

**NABARD**: National Bank for Agriculture and Rural Development

**NGO**: Non-Governmental Organization

**NFSM**: National Food Security Mission

**NPA**: Non-Performing Assets

**NSSO**: National Sample Survey Office

**OECD**: Organization for Economic Co-operation and Development

**OGB**: Odisha Gramya Bank

**PIB**: Press Information Bureau

**PM Kisan**: Pradhan Mantri Kisan Samman Nidhi

**PMAY**: Pradhan Mantri Awas Yojana

**PMEGP**: Prime Minister's Employment Generation Programme

**PMFBY**: Pradhan Mantri Fasal Bima Yojana

**PMJDY**: Pradhan Mantri Jan Dhan Yojana

**PMKSY**: Pradhan Mantri Krishi Sinchai Yojana

**RBI**: Reserve Bank of India

**RCB**: Rural Cooperative Bank

**RRB**: Regional Rural Bank

**SAFAL**: Scheme for Accelerating Financial Inclusion & Livelihoods

**SBI**: State Bank of India

**SC/ST**: Scheduled Castes/Scheduled Tribes

**SCB**: Scheduled Commercial Bank

**SDGs**: Sustainable Development Goals

**SHG**: Self-Help Group

**SIDBI:** Small Industries Development Bank of India

**SME**: Small and Medium Enterprises

**UGB**: Utkal Grameen Bank

**UN**: United Nation

**UPI**: Unified Payments Interface

**YONO**: You Only Need One (SBI's integrated digital banking platform)

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# Chapter 1 – Introduction

This chapter provides an overview of the study's foundation, setting the context for understanding agricultural credit and its significance for rural development. The chapter is organised into several sections to give the background of the study showing how agriculture is significant for the Indian economy, the government initiatives to promote agriculture, the agriculture credit-related initiatives, and the background of agricultural and credit in the state of Odisha.

## 1.1. Agriculture in India

Agriculture in India, often hailed as the backbone of the nation's economy, is a sector of paramount importance, deeply intertwined with the cultural, social, and economic fabric of the country. This expansive and dynamic field encompasses a broad spectrum of activities, from traditional subsistence farming practices to modern agribusiness enterprises, all contributing to the sustenance and economic prosperity of millions.

The history of Indian agriculture is a tale of continuous evolution, marked by significant transformations that have shaped the current landscape (Pathak et al., 2022). Ancient India saw the dawn of settled agricultural communities as early as the Indus Valley Civilization, where evidence of sophisticated irrigation and crop management techniques has been discovered. Over centuries, agricultural practices evolved, influenced by climatic conditions, regional cultures, and technological advancements. The Mauryan Empire, under the reign of Ashoka, witnessed further agricultural development with extensive land reforms and the promotion of agricultural education. The Mughal era brought a blend of indigenous and Persian farming techniques, introducing new crops and irrigation methods.

Post-independence, India faced significant food security challenges, prompting a series of agricultural reforms. In the 1960s and 1970s, there was a big change called the Green Revolution. Farmers started using better seeds, chemicals to make crops grow better and better ways to water crops (Swaminathan and Kesavan, 2017). This period saw a dramatic increase in agricultural productivity, particularly in wheat and rice, transforming India from a food-deficient nation to one of the world's leading agricultural producers.

Traditional wisdom and modern science are present in Indian agriculture today (Agriculture Census Division, 2019). The sector includes crop production, horticulture, animal husbandry, fisheries, and forestry. Technological advancements, such as precision farming, genetically modified crops, and sustainable practices like organic farming, are increasingly being adopted. The Pradhan Mantri Krishi Sinchai Yojana and the National Food Security Mission aim to boost productivity and ensure equitable growth.

### 1.2. Importance of Agriculture Sector

Agriculture in India transcends mere economic activity; it is the lifeline of millions of people, especially in rural areas. It is not only a source of livelihood but also a means of social identity and cultural heritage. The importance of agriculture in India is multidimensional, encompassing economic, social, and environmental aspects.

- *Role in Sustaining Livelihoods*

A significant portion of the Indian populace relies heavily on farming for sustenance. The World Bank estimates that nearly 43% of India's workforce is involved in agricultural endeavours, including farming, livestock rearing, and related fields (International Labour Organization, 2022). For many rural households, agriculture is not only an economic activity but also a way of life, deeply rooted in tradition and community values.

- *Food Security*

One of the most critical roles of agriculture is ensuring food security. India, with its vast population, faces a significant challenge in meeting the nutritional needs of its citizens. The main source of food production is agriculture, which produces fruits, vegetables, dairy products, and staples like rice, wheat, and pulses. India was formerly a food-deficient country, but the Green Revolution of the 1960s and 1970s helped to turn it into a food-surplus country (National Food Security Portal, 2024). India is currently among the top producers of a number of agricultural products, ensuring its food production independence.

- *Economic Growth*

Agriculture acts as a significant driver of economic growth. The sector contributes approximately between 16 and 18% of the country's gross domestic product (GDP) (Food and Agriculture Organization, 2024). Beyond direct contributions, agriculture stimulates growth in related industries such as food processing, textiles, and manufacturing, creating a multiplier effect across the economy. The majority of farmers in the nation, or 86% of them,

are small and marginal farmers who play a crucial role in food production (Agriculture Census Division, 2019). These farmers, despite limited resources and access to technology, contribute significantly to the nation's agricultural output.

- *Employment and Rural Development*

The role of agriculture in employment generation cannot be overstated. The sector provides both direct and indirect employment opportunities, from farming and labour to agro-processing and logistics. In numerous rural regions, agriculture serves as the primary source of income and employment, rendering it imperative for the advancement of rural areas and the alleviation of poverty (Ministry of Finance, 2024).

In rural India, agriculture is the primary sector for employment. The Census of 2011 indicates that around 55% of the population works in agriculture and related fields. This sector provides not only direct employment in farming but also generates numerous ancillary jobs in agro-processing, transportation, retail, and other related sectors. The employment generated by agriculture is crucial for rural development and poverty alleviation (Das, 2020). In regions where industrial and service sectors are underdeveloped, agriculture remains the backbone of the local economy. It provides income stability and sustenance to millions of families, making it indispensable for rural livelihoods.

- *Revenue and Foreign Exchange*

Agriculture is a substantial source of revenue for the Indian economy, particularly through exports. India has a major share in terms of exporting agricultural commodities such as rice, spices, tea, and cotton (APEDA, 2022). The export of these products not only generates valuable foreign exchange but also enhances India's global trade footprint, fostering international economic relations.

- *Resilience and Economic Stability*

Agriculture acts as a safety net during times of economic uncertainty, providing stability and resilience to the overall economy. During economic downturns or global financial crises, the agricultural sector often remains relatively stable compared to other sectors (PMFBY, 2023). This stability is vital for maintaining socio-economic balance and preventing widespread economic distress.

- *Social and Cultural Significance*

The Indian social and cultural fabric is strongly tied to agriculture. Festivals like Baisakhi, Pongal, Makar Sankranti, and Onam are centered on agricultural activities and the harvest season (Ministry of Finance, 2024). These festivals celebrate the hard work of farmers and the bounty of nature, reflecting the cultural importance of agriculture. Rural communities often revolve around farming activities, with traditions, rituals, and social structures closely linked to agricultural cycles.

- *Industrial Growth and Diversification*

The agricultural sector serves as a crucial supplier of raw materials for various industries, fostering industrial growth and diversification. Key industries that rely heavily on agricultural inputs include:

✓ Food-Processing Industries

One of India's biggest industries is the food-processing sector, which is dependent on agricultural produce. This industry adds value to raw agricultural products through processes such as canning, packaging, and refining, creating a wide array of food products for domestic consumption and export. The sector also generates substantial employment opportunities and contributes to rural development (International Labour Organization, 2022).

✓ Textile Industry

The textile industry, another major contributor to the Indian economy, relies on agricultural outputs like cotton, jute, silk, and wool. India is among the world's top producers of cotton, and the export revenue of the nation is mostly dependent on the cotton textile sector. The jute industry, centred primarily in West Bengal, also contributes significantly to employment and export revenues (Pathak et al., 2022).

✓ Pharmaceutical Industry

The pharmaceutical industry utilizes various agricultural products, particularly medicinal plants and herbs. India is rich in biodiversity, and the cultivation of medicinal plants provides raw materials for the production of herbal medicines and pharmaceuticals. This sector not only contributes to the economy but also supports traditional knowledge and practices (Mishra et al., 2020).

- *Environmental Sustainability*

Sustainable agricultural practices are vital for environmental conservation. Traditional farming methods such as crop rotation, mixed cropping, and agroforestry contribute to biodiversity and soil health. Organic farming, which avoids synthetic chemicals and fertilizers, helps in maintaining ecological balance and reducing environmental pollution. Sustainable agriculture not only preserves natural resources but also ensures long-term productivity and resilience against climate change.

### 1.3. Challenges and Future Outlook

Despite its critical importance, Indian agriculture faces numerous challenges that hinder its growth and sustainability. Some of the key challenges include:

- *Fragmented Landholdings*

The average landholding size in India is small and fragmented, which limits economies of scale and efficient farming practices. It is often difficult for marginal and small-scale farmers to obtain markets, credit, and advanced technologies (Agriculture Census Division, 2019).

- *Climate Change*

Climate change poses a severe threat to India's agriculture. Unpredictable weather patterns, changing rainfall patterns, and an increase in the frequency of extreme weather events like droughts and floods have a negative influence on crop yields and livestock output (APEDA, 2022).

- *Infrastructure Deficiencies*

Inadequate infrastructure which includes problems in irrigation facilities, storage, transportation, and market access, hampers agricultural productivity and profitability of farmers. Poor infrastructure leads to post-harvest losses and limits farmers' ability to get fair prices for their produce (NABARD, 2024).

- *Market Access and Price Variability*

Accessing markets and getting fair prices for their produce can be difficult for farmers. Price volatility and market imbalances can lead to financial instability and distress among farmers. The lack of adequate marketing infrastructure and the dominance of middlemen further exacerbate the problem (Das, 2020).

- *Technological Adoption*

While there have been advancements in agricultural technology, the adoption rate among small and marginal farmers remains low. Limited access to credit, knowledge, and resources hinders the widespread adoption of modern farming techniques and technologies (Bathla et al., 2020).

- *Formal Credit Access Constraints*

For numerous Indian farmers, obtaining formal financing continues to be a formidable obstacle. Due to strict lending requirements, a dearth of collateral and convoluted application procedures, small and marginal farmers frequently encounter difficulties obtaining loans from mainstream banking institutions. As a result, they rely on informal credit sources, which typically charge exorbitant interest rates, leading to indebtedness and financial distress (RBI, 2019).

### 1.4. Background of the Study

In India, the agricultural sector plays a crucial role as the foundation of the rural economy and is a major contributor to the country's GDP. In addition to employing a sizable percentage of the workforce, this industry is essential to maintaining food security. Despite its significance, Indian agriculture confronts numerous difficulties, such as socioeconomic inequality, insufficient infrastructure, and climate change. With a focus on Odisha, this study attempts to provide a thorough overview of the state of Indian agriculture today, emphasising the major problems, developments, and governmental initiatives.

As of 2023, 16% of India's GDP comes from the agricultural sector, which also employs roughly 50% of the labour force (Ministry of Agriculture and Farmers' Welfare, 2023). A group led by Balkrishna et al. (2023) reported that the agricultural revolution in India is driven by technology and data analytics, with a focus on digital platforms and applications. The key factors for success include affordability, ease of access, and policy support. The Indian government is promoting digital agriculture through initiatives like the Agristack program. While there is potential for big data analytics, IoT, automation, and AI to optimise productivity, challenges include a lack of uniformity, fragmented initiatives, and the need for a tailor-made digital approach (Balkrishna et al., 2023). Soil health cards assist farmers in maximising fertiliser usage, while government programs such as the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) concentrate on enhancing irrigation infrastructure (PMKSY, 2022).

Notwithstanding its remarkable contribution to the Indian economy, the agricultural sector continues to confront several enduring obstacles. With more frequent extreme weather events like droughts and floods impacting agricultural productivity, climate change poses a serious threat. Climate change poses serious risks to Indian agriculture due to its reliance on rain-fed land, affecting crop yield, soil processes, water availability, and pest dynamics. However, adaptation strategies and mitigation efforts such as changing land-use practices and enhancing input-use efficiency are being implemented to minimise these risks and make Indian agriculture climate-smart (Pathak, 2023). Further, access to institutional credit is still a major barrier. Many small and marginal farmers continue to rely on high-interest informal lending sources, even in the face of government measures such as the Pradhan Mantri Fasal Bima Yojana (PMFBY) for crop insurance and the Kisan Lending Card (KCC) scheme. To increase these programs' efficacy and reach, more work must be done (RBI, 2023).

The COVID-19 lockdown in India also had severe consequences for farming systems, leading to disruptions in agricultural supply chains, shortages of food supplies, and increased prices, highlighting the need for sustainable agro-policies in response to future pandemics (Kumar et. al, 2021). Post-COVID, the sector has shown resilience, with the government implementing several relief measures, including direct cash transfers, loan moratoriums, and increased procurement at MSP (Cariappa et al., 2021). However, the recovery is uneven, with small and marginal farmers facing more significant hurdles in bouncing back compared to larger agricultural enterprises.

### *1.4.1. Government Initiatives and Future Prospects*

The budget allocated to agriculture by the Indian government has increased dramatically, from ₹1.37 lakh crore in 2007–14 to ₹7.27 lakh crore in 2014–25. In terms of farmer enrolment, the Pradhan Mantri Fasal Bima Yojana (PMFBY) has grown to be the largest crop insurance program globally. Additionally, ₹35,262 crores have been approved by the government for 48,352 projects under the Agriculture Infrastructure Fund. These projects include cold storage facilities, processing facilities, custom hiring centres, and warehouses (PIB, 2024).

The minimum support price of all 22 crops was initially set at a minimum of 50% more than the cost, marking a historic increase in the MSP. To offer information on the nutrient status of the soil, 23.58 crore farmers have received soil health cards. The government's emphasis on

enhancing input quality is demonstrated by the launch of 100% neem-coated urea and the increase in urea production to 310 lakh metric tonnes from 225 lakh metric tonnes in 2014 (PIB, 2024). Additionally, Farmer Producer Organizations (FPOs) and Paramparagat Krishi Vikas Yojana promotions. 7,950 FPOs were registered as of January 31, 2024, and 3,183 FPOs had received an equity award of ₹142.6 crore. From 2014–15 to December 2023, ₹6,405.55 crores were invested in agricultural mechanization, with ₹141.41 crores going toward the marketing of Kisan drones (PIB, 2024).

To further improve market access, 2.53 lakh traders and 1.77 crore farmers have registered on the e-NAM platform. Since Kisan Rail's launch, 2,359 services have been provided on 167 routes through February 2023, enhancing farmers' transportation logistics. Encouraging farmers with programs like PM-KISAN, PM-KMY, and higher MSPs for different crops has given them security of income and stability in their finances. The government has disbursed more than ₹2.80 lakh crore through PM-KISAN, while 4 crore farmers are covered by crop insurance via PMFBY, with claims totalling ₹1.5 lakh crore (Sitharaman, 2024).

The constant increase in Minimum Support Prices (MSPs) for 22 Kharif and Rabi crops is another noteworthy initiative. The last ten years have seen farmers receive over Rs. 1.25 lakh crore. The Minimum Support Price (MSP) for wheat and paddy crops is 18 lakh crore. This is 2.5 times higher than what was done in the ten years before 2014 (Cariappa et al., 2021). Further, the e-NAM platform and drone technology are two examples of the government's initiatives to promote digital inclusion and automation to increase market efficiency and production. Agristack and computerized Primary Agricultural Credit Societies (PACS) programs enhance systems for credit delivery, monitoring, and planning (Cariappa et al., 2021).

Overall, the resilience of the agricultural sector is demonstrated by the notable growth in food grain output, which increased by 14.1 million tonnes from the previous year to 329.7 million tonnes in FY23. Additionally, agricultural exports increased to ₹4.2 lakh crore in FY23, demonstrating India's capacity to meet the world's food needs (Department of Economic Affairs, 2024).

Recognising the importance of agriculture, the Indian government has introduced a number of programs to address these issues and advance the development of sustainable agriculture. These initiatives can be broadly categorised into Credit and Non-credit initiatives:

- ***Credit Initiatives***

✓ Pradhan Mantri Fasal Bima Yojana (PMFBY)

In the event that pests, insects, or natural disasters cause farmers' crops to fail, this crop protection plan offers them financial support. It aims to keep farmers' earnings stable while encouraging them to employ innovative farming methods (PMFBY, 2023).

✓ KCC

The Kisan Credit Card scheme aims to provide cultivators with to access credit on time for their cultivation and other needs, considering post-harvest expenses and consumption requirements. This scheme simplifies the process of obtaining credit and reduces the reliance on informal credit sources, which often charge high interest rates (Chatterjee, 2015).

✓ Balaram Yojana

The Odisha Balaram Yojana, launched by the Odisha Government, aims to provide financial assistance through loans up to Rs. 1.6 lakh to each Joint Liability Group (JLG) of farmers affected by the COVID-19 outbreak, benefiting landless farmers in the state. The scheme focuses on providing credit to around seven lakh landless farmers over the next two years, with the implementation coordinated at the state and regional levels (Department of Agriculture & Farmers' Empowerment, 2022).

✓ Interest Subvention Scheme for Short-Term Crop Loans

Through this program, farmers can obtain short-term crop loans up to INR 3 lakhs with interest subvention from the government, making lending more accessible. Through this program, farmers will have less financial strain and be encouraged to invest in more advanced farming techniques and technology (NABARD, 2021).

✓ Agricultural Infrastructure Fund

This program offers medium to long-term debt financing for the acquisition of community farming assets and infrastructure for post-harvest management. The aim is to improve the overall agricultural infrastructure, thereby enhancing the efficiency and profitability of the agricultural sector (Ministry of Commerce and Industry, 2021).

- ***Non-credit Initiatives***

✓ Pradhan Mantri Krishi Sinchai Yojana (PMKSY)

This initiative aims to broaden the reach of irrigation systems and enhance water utilization by constructing new ones and updating those already in place. It promotes micro-irrigation techniques such as drip and sprinkler systems to ensure ‘more crop per drop’ (PMKSY, 2017).

- ✓ National Food Security Mission (NFSM)

The NFSM aims to increase the production of commercial crops, rice, wheat, pulses, and coarse cereals by increasing area and productivity. It focuses on improving soil health, promoting the use of quality seeds, and adopting efficient farming practices (Das, 2020).

- ✓ Soil Health Card Scheme

Promoting soil testing and giving farmers comprehensive information on the nutrient status of their soil are the goals of the Soil Health Card Scheme (Ministry of Agriculture & Farmers Welfare, 2023). This enables farmers to be able to use fertilizers more efficiently and adopt sustainable soil management practices.

- ✓ E-NAM (National Agriculture Market)

Through the integration of current APMC (Agricultural Produce Market Committee) markets, the e-NAM platform seeks to establish a single national market for agricultural commodities (PIB, 2024). It facilitates online trading, price discovery and better market access for farmers.

### *1.4.2. Agricultural Background of Odisha*

Turning to the state level, Odisha, located on the eastern coast of India, presents a unique agricultural profile characterised by diverse crops and predominantly rain-fed agriculture. The state's agriculture sector employs about 60% of the workforce and contributes roughly 18% to the state's GDP (Planning and Convergence Department, 2024). The agricultural landscape in Odisha is marked by its reliance on paddy cultivation, which occupies the largest share of the net sown area of approximately 5.7 million hectares. Other significant crops include pulses, oilseeds, and vegetables (Directorate of Agriculture, Odisha, 2023).

Despite efforts to diversify agricultural income sources through promoting horticulture and floriculture, productivity levels in Odisha remain generally lower than the national average. For instance, the yield of paddy in Odisha is around 1.6 tonnes per hectare, compared to the national average of 2.7 tonnes per hectare (Kumar, 2021). Limited irrigation infrastructure

exacerbates this issue, with only about 34% of the cultivated area being irrigated; making Odisha highly dependent on monsoon rains (Odisha State Agricultural Marketing Board, 2023). The state's susceptibility to natural disasters such as cyclones and floods poses a continuous threat to agricultural productivity. Frequent natural disasters result in significant crop losses and disrupt the livelihoods of farmers, necessitating more resilient agricultural practices (Disaster Management Department, Odisha, 2023).

Further, infrastructure and market access issues are significant impediments to the growth of Odisha's agricultural sector. The lack of adequate storage facilities, poor road connectivity, and limited market access result in considerable post-harvest losses and hinder farmers from obtaining fair prices for their produce. Efforts to improve rural infrastructure, such as the construction of cold storage units and the development of rural roads, are essential steps toward addressing these challenges (Odisha State Planning Board, 2023).

The Odisha government has implemented several initiatives to support the agricultural sector, including input subsidies, crop insurance schemes, and the provision of minimum support prices (MSP) for various crops. However, the effective implementation and reach of these schemes require continuous improvement. The Odisha State Agricultural Policy 2023 outlines various measures to enhance productivity, promote sustainable farming practices, and improve market access, but translating these policy objectives into tangible outcomes remains a complex challenge (Odisha State Agricultural Policy, 2023). Additionally, efforts to enhance credit flow to the agricultural sector include programs like the Mukhyamantri Krishi Udyog Yojana, which aims to provide financial assistance to farmers for setting up agribusinesses. Despite these initiatives, many small and marginal farmers in Odisha still rely on informal credit sources, highlighting the need for more inclusive financial services (Odisha State Cooperative Bank, 2023).

The COVID-19 pandemic significantly impacted agriculture in Odisha, similar to the national scenario. Pre-COVID, the sector was struggling with low productivity and inadequate infrastructure. The pandemic's onset worsened these issues, with lockdowns disrupting supply chains and labour availability, leading to increased post-harvest losses and reduced farmer incomes. The state government responded with various relief measures, including increased procurement at MSP, distribution of free rations, and financial support schemes (Bauza, 2021). Post-COVID, the sector is gradually recovering, but the pace of recovery

varies across different regions and farm sizes, with small and marginal farmers facing more challenges in accessing resources and markets (Das, 2020).

Agriculture and allied activities contribute 20.60% to Odisha's Gross Value Added (GVA). The state is highly dependent on monsoons, making its agricultural activities sensitive to weather conditions. In the year 2020-21, the total food grains production was reported at 130.39 lakh metric tons, with rice being the dominant crop. The average size of operational landholdings in Odisha is 0.95 hectares, and the cropping intensity stands at 158%, with the net sown area being 54.15 lakh hectares (NABARD, 2024).

The banking sector in Odisha comprises a robust network of 31 commercial banks, 2 Regional Rural Banks, the Odisha State Cooperative Bank, and 17 District Central Cooperative Banks. The Credit-Deposit (CD) ratio in the state saw a significant increase from 62.20% in March 2021 to 72.22% in March 2022. Kisan Credit Cards (KCC) play an essential role in the state's agricultural finance, with 51.33 lakh operative accounts as of March 2022, facilitating credit access to farmers (Odisha State Agricultural Marketing Board, 2023).

The Micro, Small, and Medium Enterprises (MSME) sector in Odisha has demonstrated notable growth. By March 2021, 4,93,625 MSMEs had been established, employing 18.11 lakh individuals. The state has implemented a dedicated MSME Development Policy that emphasises ease of doing business; capacity building, cluster development, and enabling credit flow, thereby fostering a conducive environment for MSME growth (Odisha State Planning Board, 2023).

Financial inclusion and microcredit initiatives are pivotal in Odisha's development strategy. Under the Prime Minister Jan Dhan Yojana (PMJDY), 1.86 crore accounts were opened, accumulating deposits of Rs. 7242.05 crore as of March 2022. Additionally, microcredit initiatives have linked 8.74 lakh Self-Help Groups (SHGs) with savings accounts, and 4.34 lakh groups have loans outstanding, reflecting the emphasis on grassroots financial inclusion (Odisha State Cooperative Bank, 2023).

Infrastructure development is critical to Odisha's growth, with NABARD supporting the creation of rural infrastructure, including irrigation, rural connectivity, storage facilities, and social sector infrastructure. The total financial outlay for these investments has been assessed

at Rs. 10,058.35 crores, underscoring the state's commitment to enhancing its rural infrastructure (Odisha State Planning Board, 2023).

Climate change adaptation and mitigation are also major concerns for Odisha, given its extensive coastline. The state faces significant climate-related challenges such as cyclonic storms, erratic monsoons, and coastal erosion. To address these, Odisha has implemented the State Action Plan for Climate Change (SAPCC) and participates in various national missions, including the National Solar Mission and the Green India Mission (Odisha State Planning Board, 2023).

Lastly, the Government of Odisha has launched several policy initiatives to support agriculture, MSME, and rural development. NABARD plays a crucial role in promoting sustainable and equitable agriculture and rural development through both financial and non-financial interventions. These comprehensive efforts are aimed at driving sustainable and inclusive growth in Odisha, leveraging targeted credit, infrastructure development, and robust policy support (Odisha State Agricultural Policy, 2023).

### 1.5. Financial Inclusion in Odisha

The State of Odisha, with its rich heritage and numerous demographic and geographical advantages, has made significant progress in literacy, poverty reduction, natural resource management, and policy reforms. As per the report by SIDBI (2017) ‘Status of Financial Inclusion & Way Forward - Odisha 2012-17’, Odisha lags behind national averages on key indicators, including per capita income and poverty ratio (SIDBI, 2013). Odisha has a significant ST and SC population. The state faces challenges such as regional, social, and gender disparities, with 19 districts affected by left-wing extremism, including the KBK region. The state also deals with regional imbalances, poor rural infrastructure, low productivity, and dependence on agriculture, compounded by recurrent natural calamities. Major challenges include providing financial services to remote areas, improving per capita income, and promoting livelihoods for low-income populations.

Table 1.1 depicts the financial inclusion metrics for Odisha as on 31st March 2023. Credit-deposit ratio indicates the proportion of deposited funds that are lent out as credit. A higher ratio signifies more credit being provided relative to deposits. The banking infrastructure data for Odisha reveals significant disparities across its districts. The state's overall Credit-Deposit (CD) ratio is 76.52%, indicating that a large portion of deposits is being utilized for credit.

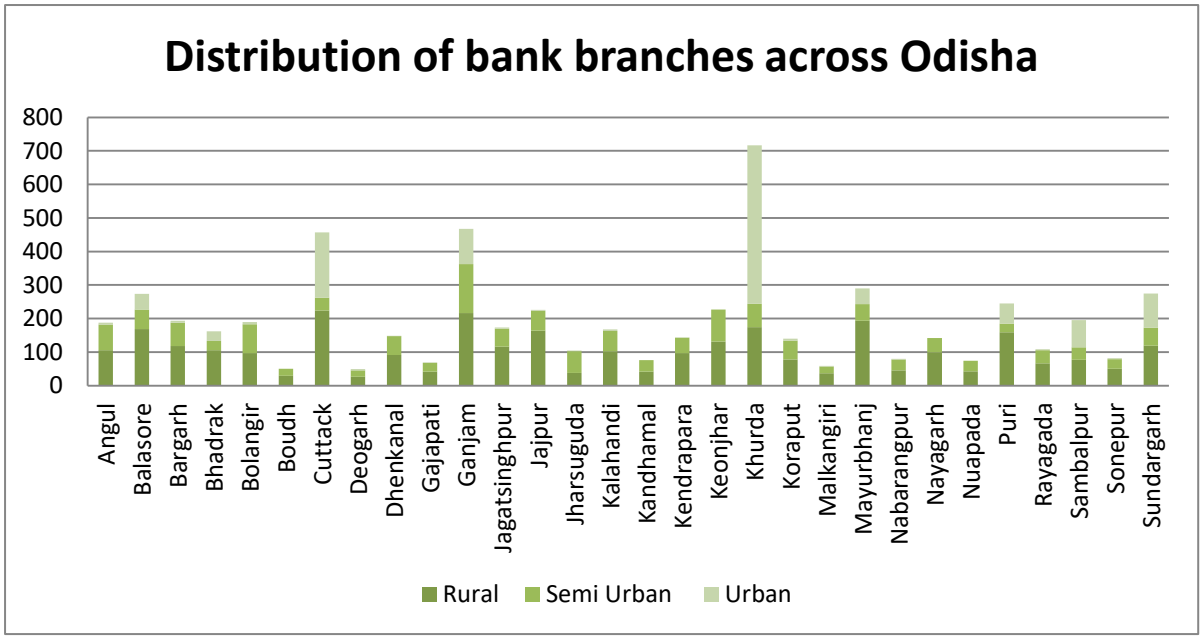
However, districts like Jharsuguda have an exceptionally high CD ratio of 246.77%, suggesting a strong lending activity relative to deposits, while Mayurbhanj has a low CD ratio of 48.87%, indicating underutilisation of deposited funds. The number of bank branches, business correspondents, and ATMs also varies widely, with Khurda having the highest number of bank branches (717) and ATMs (1,293), reflecting a well-developed banking infrastructure. Khurda has the highest urban population and the highest number of bank branches can be attributed to the higher representation of urban areas. Figure 1.1 depicts the number of bank branches in each district area-wise. In contrast, Boudh, with only 50 bank branches and 47 ATMs, shows limited banking accessibility. Figure 1.2 depicts the number of ATMS across Odisha. The efforts to increase the presence of business correspondents in regions like Balasore and Ganjam, which have 2,880 and 3,895 correspondents respectively, indicate a focus on extending banking services to remote areas. Figure 1.3 shows the number of bank correspondents over the regions. Overall, while Odisha shows a reasonably high state-wide CD ratio, the uneven distribution of banking services underscores the necessity for targeted interventions to improve financial access in less-served districts.

Table 1.1 Financial inclusion metrics in Odisha as on 31st March 2023

| **BANKS** | **Credit-Deposit Ratio** | **Bank Branches** | **Business Correspondents** | **ATMs** |
|---|---|---|---|---|
| *Angul* | 63.57 | 188 | 1118 | 292 |
| *Balasore* | 63.96 | 274 | 2880 | 365 |
| *Bargarh* | 87.75 | 193 | 1959 | 199 |
| *Bhadrak* | 74.73 | 162 | 1888 | 260 |
| *Bolangir* | 75.54 | 190 | 2731 | 211 |
| *Boudh* | 86.81 | 50 | 519 | 47 |
| *Cuttack* | 59.34 | 457 | 3349 | 614 |
| *Deogarh* | 51.9 | 49 | 296 | 44 |
| *Dhenkanal* | 66.44 | 149 | 1431 | 161 |
| *Gajapati* | 49.99 | 69 | 387 | 71 |
| *Ganjam* | 63.95 | 467 | 3895 | 622 |
| *Jagatsinghpur* | 57.52 | 173 | 2239 | 233 |
| *Jajpur* | 90.77 | 226 | 2208 | 320 |
| *Jharsuguda* | 246.77 | 105 | 572 | 144 |

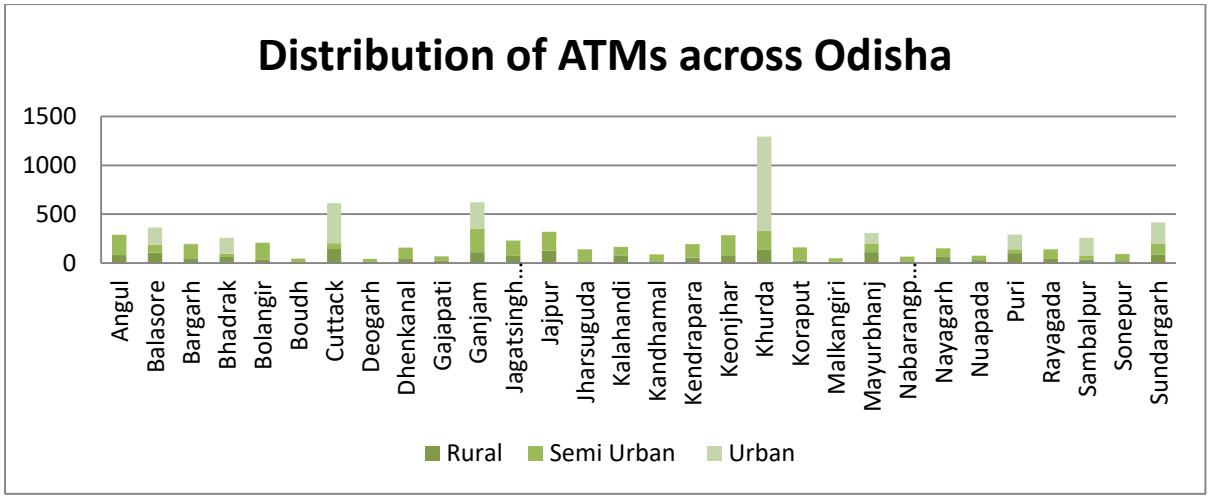
| | | | | |
|---|---|---|---|---|
| *Kalahandi* | 106.34 | 168 | 2255 | 166 |
| *Kandhamal* | 55.57 | 76 | 763 | 88 |
| *Kendrapara* | 56.38 | 144 | 1025 | 193 |
| *Keonjhar* | 55.86 | 227 | 1522 | 284 |
| *Khurda* | 75.42 | 717 | 3189 | 1293 |
| *Koraput* | 64.91 | 140 | 1306 | 164 |
| *Malkangiri* | 57.96 | 59 | 658 | 51 |
| *Mayurbhanj* | 48.87 | 290 | 2619 | 309 |
| *Nabarangpur* | 77.17 | 80 | 1295 | 68 |
| *Nayagarh* | 78.3 | 142 | 1329 | 153 |
| *Nuapada* | 66.72 | 74 | 904 | 76 |
| *Puri* | 53.22 | 245 | 2198 | 292 |
| *Rayagada* | 108.87 | 108 | 878 | 141 |
| *Sambalpur* | 106.06 | 195 | 1060 | 258 |
| *Sonepur* | 80.67 | 82 | 1034 | 93 |
| *Sundargarh* | 55.3 | 275 | 1416 | 415 |
| **Total** | **76.52** | **5774** | **48923** | **7627** |

*Source:* SLBC Odisha



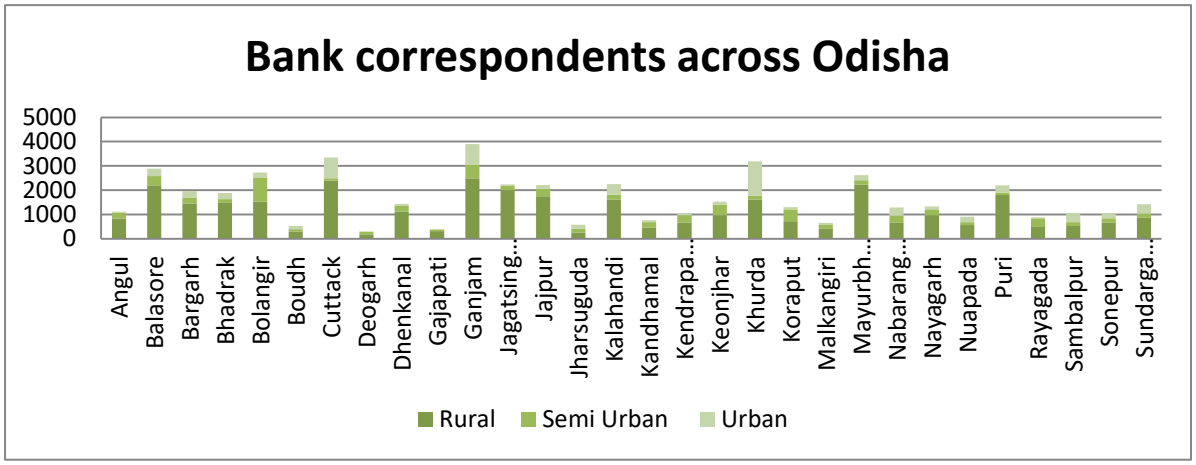

*Source:* SLBC Odisha

**Figure 1.1** Bank branches in Odisha




*Source:* SLBC Odisha

**Figure 1.2** No. of ATMs in Odisha




*Source:* SLBC Odisha

**Figure 1.3** Bank correspondents in Odisha

### 1.6. Sources of Credit

For farmers in India to invest in infrastructure, technology, and inputs, financing availability is essential. There are various types of credit available to farmers, each catering to different needs and circumstances.

- **Institutional Credit**

Institutional sources like commercial banks, cooperative banks, RRBs, MFIs, and SHGs offer formal loans. These loans are regulated by the Reserve Bank of India (RBI) and other financial regulatory authorities, ensuring standardized procedures and protections for borrowers (Swamy, 2018). Institutional credit offers advantages like lower interest rates,

structured repayment terms, regulatory protections, and access to larger loan amounts for investments. The challenges of institutional credit include stringent eligibility criteria, complex procedures, and limited reach in rural areas, hindering access for small farmers (Swinnen and Gow, 1999; Khan et al., 2024). It includes credit from the following sources;

- ✓ ***Commercial Banks***

For farmers, one of the main sources of institutional finance is commercial banks. They provide a range of loan products, including long-term loans for infrastructure development, medium-term loans for buying equipment and livestock, and short-term loans for farming. These loans often come with government-subsidized interest rates under schemes like the Interest Subvention Scheme for Short-Term Crop Loans (Meyer, 2011).

- ✓ ***Cooperative Banks***

Credit to farmers, particularly in rural regions, is largely provided by cooperative banks, such as State Cooperative Banks, District Central Cooperative Banks (DCCBs), Large Area Multipurpose Societies (LAMPS), and Primary Agricultural Credit Societies (PACS). They offer various credit facilities, including crop loans, input loans, and term loans for agricultural activities (Kumar et al., 2015).

- ✓ ***Regional Rural Banks (RRBs)***

RRBs were set up to provide rural artisans, agricultural labourers, and small and marginal farmers access to credit and other resources. They offer a variety of loan products, frequently at discounted rates, such as agricultural loans with short and long terms (Misra, 2007).

- ✓ ***Microfinance Institutions (MFIs)***

Farmers and other rural business owners without access to standard banking facilities can apply for small loans from MFIs. These institutions focus on group lending models, which mitigate the risk of default and enable farmers to access credit without collateral (FIDC, 2023).

- ✓ ***Self Help Groups (SHGs)***

Small groups of farmers, mostly women, form Self-Help Groups (SHGs) to pool funds and lend money to one another on mutually acceptable terms. These groups often receive financial support and training from NGOs and government agencies, helping them access larger institutional loans Joshi, (2019).

- **Non-Institutional Credit**

Non-institutional credit is provided by non-institutional sources such as moneylenders, traders, commission agents, and friends and family. These unregulated loans lack standardised procedures, leading to significant variability in terms and conditions (Hintsa, 2011). Advantages of non-institutional credit include ease of access, flexibility in terms, and the personal relationships that facilitate borrowing from friends and family. Whereas, the challenges of informal credit include high interest rates, lack of legal protections for borrowers, and unfavourable terms like requiring produce sales at below-market rates to lenders. The following are some major sources of non-institutional credit;

- ✓ ***Moneylenders***

Moneylenders are traditional sources of credit in rural areas. They offer quick and easy access to credit without the formalities required by banks. However, the interest rates charged by moneylenders are usually very high, leading to a cycle of debt for many farmers (Banerjee and Duflo, 2007).

- ✓ ***Traders and Commission Agents***

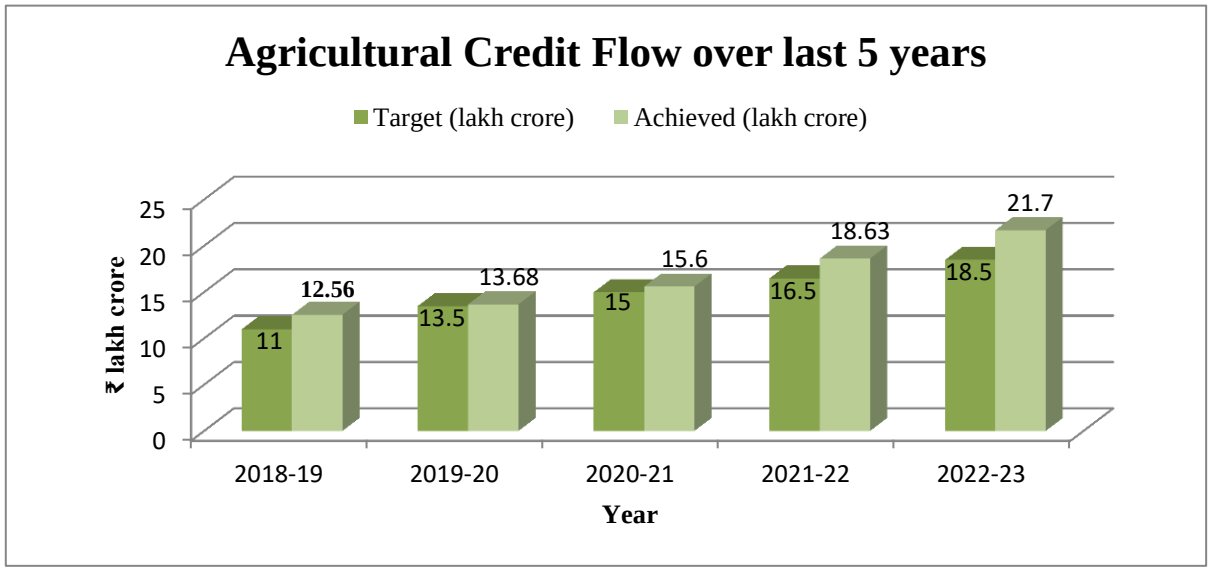
Traders and commission agents give farmers credit against the sale of their produce in the future. This type of credit, known as trade credit, is often used to purchase inputs like seeds and fertilisers. While convenient, it can lead to unfavourable terms for farmers when selling their produce (Banerjee and Duflo, 2007).

- ✓ ***Friends and Family***

Loans from friends and family are another common source of credit for farmers. These loans are typically interest-free or carry lower interest rates compared to institutional loans. However, reliance on such sources is limited by the financial capacity of the lender (Banerjee and Duflo, 2007).

### 1.7. Trends in agricultural credit flow over past five years

The growth in credit access over the last five years in India shows a positive trend, reflecting increased government efforts and financial inclusion initiatives. A timely and smooth credit flow to the farmer is crucial for boosting agriculture. In this context, the government has been establishing annual goals for ground-level credit or GLC, for the agriculture sector by scheduled commercial banks (SCB), regional rural banks (RRB), and rural cooperative banks (RCB).




*Source:* Based on data from NABARD Annual Reports, DAFW and Agricultural Statistics at a Glance 2022.

**Figure 1.4** agricultural credit flows over 5 years

**FY 2018-19**

- The target set for agricultural credit in the fiscal year 2018-19 was ₹11 lakh crore (The Economic Times, 2018).
- In India, ₹12.56 lakh crore in institutional loans flowed into the agriculture industry overall (MAFW, 2023).

**FY 2019-20**

- In India, ₹13.93 lakh crore worth of institutional loans flowed into the agriculture sector, against a target of ₹13.5 lakh crore (Kumar, 2021).
- Long-term credit accounted for 40.75% of all institutional credit flow to agriculture (NABARD, 2022). Around 13.59 crore agricultural accounts were financed during 2019-20, compared to 12.55 crore in the previous year (NABARD, 2022).

**FY 2020-21**

- The target set for agricultural credit in the fiscal year 2020-21 was ₹15 lakh crore (NABARD, 2021).
- The agricultural credit disbursement in 2020-21 was ₹15.75 lakh crore (NABARD, 2021).
- With a compound annual growth rate (CAGR) of 19.81% from 1999-2000 to 2019-20, agricultural credit disbursement has grown significantly over time (NABARD, 2022).

**FY 2021-22**

- The target set for agricultural credit in the fiscal year 2021-22 was ₹16.5 lakh crore crore (NABARD, 2022).
- The agricultural credit disbursement in 2020-21 was ₹18.63 lakh crore (NABARD, 2022).

**FY 2022-23**

- For the fiscal year 2022–2023, the agriculture credit objective was ₹18 lakh crore (NABARD, 2023).
- The agricultural credit disbursement in 2022-23 was ₹21.7 lakh crore (NABARD, 2023).
- In order to guarantee farmers to receive short-term farm loans up to ₹3 lakhs at an effective annual rate of 7%, the government has been offering a 2% interest subsidy (NABARD, 2023).

**FY 2023-24 (projection)**

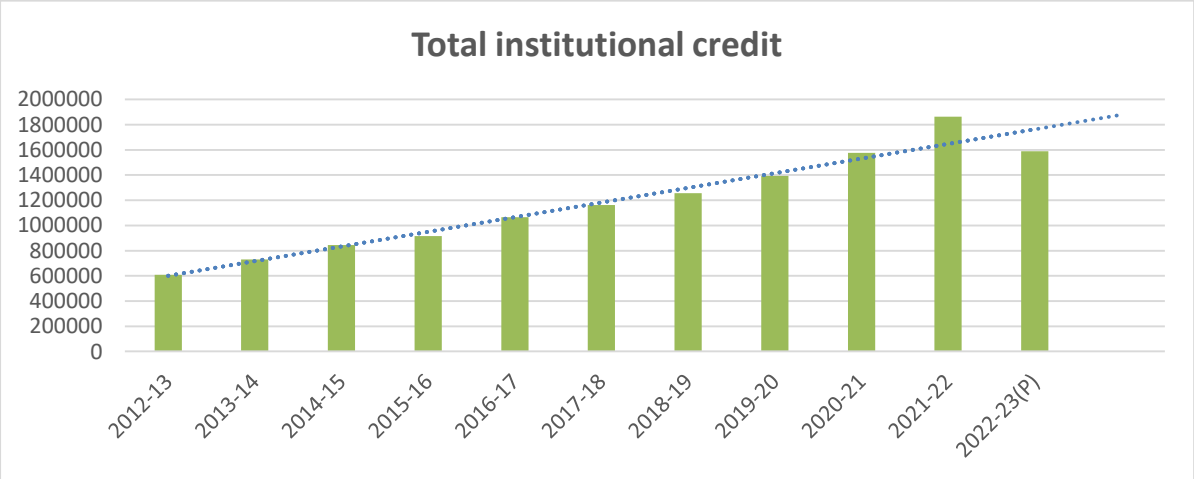
- For the fiscal year 2023–2024, the government has increased the agriculture credit target by 11% to ₹20 lakh crore (NABARD, 2023).
- The GLC target for allied sectors for FY 2023-24 is ₹2.93 lakh crores (NABARD, 2023).

These numbers show a steady increase in agricultural credit in India during the previous five years, which can be attributed to legislative changes, government initiatives, and rural financial institutions' efforts to help farmers with timely and sufficient loan support.

### 1.8. Comparative Analysis of Agricultural Credit Distribution in India

There is a steady growth in the level of institutional credit disbursement throughout India. **Annexure C** shows the state-wise distribution of credit all over India. The southern region of

India accounts for the highest percentage of institutional credit received, while the lowest levels of credit disbursement are found in the case of the north eastern and eastern regions, respectively. Compared to north eastern regions, eastern region could be said to have larger disparities in credit distribution as the number of accounts comes to 12 per cent of the total; however, the credit disbursement is around 7 per cent only. This is contrary to the other regions where the percentage of the amount disbursed is higher or more or less similar to the number of accounts. Figure 1.5 depicts the trends in institutional credit disbursement in India.




2022-23(P): Provisional as on 1st Jan 2023.

Source: Department of Agriculture & Farmers Welfare

**Figure 1.5.** Trends in institutional credit flow to the agriculture sector

Agricultural credit distribution across different regions in India is detailed below;

- **Northern Region**

The Northern Region, comprising states like Punjab, Haryana, Delhi, and others, is a significant contributor to agricultural credit in India.

- ✓ **Punjab:** With a total agricultural credit distribution of ₹64,39,320 lakhs, Punjab accounts for 4.05% of India's total agricultural credit. The state's robust agricultural infrastructure and heavy reliance on agriculture explain this substantial share.
- ✓ **Haryana:** Haryana follows closely with ₹58,39,818 lakhs (3.67%). The state's advanced agricultural practices and extensive irrigation facilities contribute to its high credit absorption.

- ✓ **Delhi:** As a predominantly urban area, Delhi's agricultural credit distribution is relatively lower at ₹13,37,656 lakhs (0.84%), reflecting its limited agricultural activities.

Overall, the Northern Region contributes ₹2,93,93,631 lakhs, representing 18.49% of the total agricultural credit in India, underlining its importance in the national agricultural landscape.

- **North Eastern Region**

The North Eastern Region, known for its challenging terrain and smaller scale of agricultural operations, shows a modest share in the national agricultural credit distribution.

- ✓ **Assam:** Leading the region with ₹6,01,424 lakhs (0.38%), Assam's agricultural sector is gradually improving, albeit with significant room for growth.
- ✓ **Other States:** States like Arunachal Pradesh, Manipur, and Nagaland collectively contribute less than 1%, indicating the need for more focused credit and infrastructural support.

The North Eastern Region's total contribution stands at ₹9,42,607 lakhs, accounting for 0.59% of the total, reflecting the region's nascent stage in agricultural credit uptake.

- **Eastern Region**

The Eastern Region includes states like West Bengal, Bihar, Jharkhand, and Odisha, each showing varied levels of agricultural credit distribution.

- ✓ **West Bengal:** With ₹41,17,830 lakhs (2.59%), West Bengal leads the region, benefiting from a well-established agricultural base.
- ✓ **Odisha:** Odisha's agricultural credit distribution is notable at ₹28,88,611 lakhs (1.82%). The state's diverse agro-climatic conditions and emphasis on agriculture make it a key player in the region.
- ✓ **Bihar and Jharkhand:** Bihar and Jharkhand contribute ₹32,01,043 lakhs (2.01%) and ₹7,36,680 lakhs (0.46%) respectively, showcasing significant agricultural activity with scope for further enhancement through better credit facilities.

The Eastern Region's total stands at ₹10,99,6474 lakhs, or 6.92% of the national total, highlighting its growing importance in agricultural credit distribution.

- **Central Region**

The Central Region, with states like Uttar Pradesh, Madhya Pradesh, and Chhattisgarh, is a substantial contributor to agricultural credit.

- ✓ **Uttar Pradesh:** Leading with ₹1,24,73,880 lakhs (7.85%), Uttar Pradesh's extensive agricultural activities necessitate substantial credit support.
- ✓ **Madhya Pradesh:** With ₹67,17,501 lakhs (4.23%), Madhya Pradesh's credit distribution reflects its significant agricultural output.
- ✓ **Chhattisgarh:** Contributing ₹21,85,839 lakhs (1.38%), Chhattisgarh's focus on agriculture, especially paddy cultivation, drives its credit needs.

The Central Region's total credit distribution is ₹2,23,24,170 lakhs, representing 14.05% of the national total, indicating its vital role in India's agriculture sector.

- **Western Region**

The Western Region, comprising economically advanced states like Maharashtra and Gujarat, shows high levels of agricultural credit distribution.

- ✓ **Maharashtra:** With ₹1,11,60,885 lakhs (7.02%), Maharashtra's vast agricultural landscape demands significant credit resources.
- ✓ **Gujarat:** Contributing ₹98,29,548 lakhs (6.18%), Gujarat's innovative agricultural practices and extensive irrigation support its high credit absorption.

The Western Region's total contribution is ₹2,14,23,018 lakhs, accounting for 13.48% of the national total, underlining its economic and agricultural strength.

- **Southern Region**

The Southern Region, including Tamil Nadu, Andhra Pradesh, and Karnataka, is the highest contributor to agricultural credit in India.

- ✓ **Tamil Nadu:** Leading with a remarkable ₹2,60,26,029 lakhs (16.37%), Tamil Nadu's diverse and intensive agricultural activities necessitate substantial credit.

- ✓ **Andhra Pradesh:** With ₹1,68,68,683 lakhs (10.61%), Andhra Pradesh's significant agricultural sector drives its high credit demand.
- ✓ **Karnataka and Kerala:** Karnataka and Kerala contribute ₹1,17,34,581 lakhs (7.38%) and ₹96,59,945 lakhs (6.08%) respectively, reflecting their strong agricultural bases.

The Southern Region's total credit distribution is ₹7,38,60,137 lakhs, or 46.47% of the national total, highlighting its dominant role in India's agricultural sector.

Overall, Odisha has a higher proportion of term loan accounts (4.65%) compared to crop loan accounts (3.55%). This suggests a diversified need for financial support beyond just crop cultivation, possibly indicating investments in agricultural infrastructure and equipment. Despite the significant number of accounts, the amount disbursed for crop loans and term loans is relatively lower in proportion (1.67% and 2.08%, respectively) compared to other states. This could indicate smaller average loan sizes per account or perhaps a higher number of small-scale farmers requiring smaller loans. Overall, the southern region dominates the agricultural loan sector, with Odisha's loan disbursements being limited in comparison. For instance, Tamil Nadu alone accounts for 15.21% of crop loan accounts and 14.34% of the amount disbursed. The Western and Central regions also show higher disbursements compared to Odisha, reflecting a more substantial financial engagement in agriculture.

# Chapter 2 – Literature Review

This chapter reviews existing literature on agricultural credit, financial inclusion, and rural development, with the goal of building a foundation for analysing the factors impacting credit access and the role of financial institutions. This section examines the role of banks and other financial institutions in promoting financial inclusion and reviews initiatives and strategies designed to improve rural credit access, such as government-led credit schemes, digital banking innovations, and the outreach efforts of microfinance institutions.

## 2.1. The concept of Financial Inclusion

The process of guaranteeing that people and businesses possess equitable and transparent access to appropriate financial goods and services at a fair price is known as financial inclusion, or FI. This encompasses a wider spectrum of financial services, including pensions, savings, insurance, credit, and payments. By connecting the under banked and unbanked to the official banking structure, FI hopes to increase stability and economic participation (Demirgüç-Kunt et al., 2018). The World Bank emphasizes that "FI means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit, and insurance – delivered in a responsible and sustainable way" (World Bank, 2021). According to the Reserve Bank of India (2015), FI plays an essential role in supporting equitable development, decreasing poverty, and boosting economic growth. Peterson Ozili (2021) emphasized the importance of FI and the various factors that influence it, such as financial literacy, innovation, technology, and regulatory frameworks.

FI is very important for making the economy grow and reducing poverty. It is vital to sustainable development because it gives people the tools to invest, save, and guard against shocks to the economy. It facilitates the efficient allocation of resources and enhances financial stability by broadening the base of financial users (Beck et al., 2007). Moreover, FI is in favour of achieving a number of Sustainable Development Goals (SDGs) set forth by the UN, especially those that pertain to lowering poverty, guaranteeing high-quality education, advancing gender equality, and stimulating economic growth (Yap et al., 2023). In addition to its economic benefits, FI has profound social implications. Giving people financial authority and improving their capacity to make wise financial decisions empowers people

(Cull et al., 2014). By providing women with access to financial resources so they can participate more fully in the economy, FI promotes gender equality (Sahay et al., 2015). Furthermore, FI contributes to social cohesion by reducing income inequality and promoting social mobility (Klapper & Singer, 2014).

Despite growth in the financial sector, many are still excluded due to barriers such as cost, distance, and documentation requirements (Demirgüç-Kunt and Klapper, 2012). Access to formal accounts is limited, with a majority citing a lack of funds as the main reason. Savings behaviour varies across regions, with a reliance on informal methods. This highlights the multifaceted nature of FI and the different obstacles that need to be addressed. Another main obstacle to FI is the absence of financial literacy, which limits people's capacity to effectively utilize financial services and products. Research by Lusardi and Mitchell (2014) highlights the inadequate knowledge of finance among the global population, emphasizing the need for targeted financial education programs. Additionally, socio-cultural factors such as gender norms, caste, and ethnicity can create barriers to FI, particularly for women and marginalized communities (Sahay et al., 2015). Demirgüç-Kunt et al. (2020) discussed barriers such as cost, distance, and lack of documentation as major impediments to FI in developing countries.

The absence of banking infrastructure in rural and isolated places is another major obstacle. Inadequate banking infrastructure, limited internet connectivity, and poor digital literacy hinder the implementation of financial services in these areas (Sarma & Pais, 2011). Additionally, financial services are expensive, both in terms of costs and charges associated with banking transactions, which can prevent those with low incomes from utilizing formal banking services (Collins et al., 2009). Regulatory challenges, such as stringent Know Your Customer (KYC) requirements and complex documentation processes, can also pose barriers to FI (Demirgüç-Kunt et al., 2018).

Persaud (2023) highlighted the need for a focused research agenda to address the complexities of FI in diverse economic contexts. Public-private partnerships can be quite important in tackling the issues of FI, leveraging the strengths of both sectors to develop innovative solutions and promote inclusive growth (Arner et al., 2015). Financial institutions and policymakers have to collaborate to plan and carry out financial literacy initiatives that can address the particular requirements of different population segments (Lusardi & Mitchell, 2014). The expansion of digital banking solutions, mobile money platforms, and fintech

innovations can bridge the distinction between the banking industries, formal and informal, promoting comprehensive FI (G20, 2016). Additionally, policymakers need to streamline regulatory processes, facilitating people's access to financial services while ensuring consumer protection (Demirgüç-Kunt et al., 2018).

### 2.2. Evolution of Financial Inclusion

Over the past few decades, the worldwide landscape of FI has seen tremendous change. At first, the emphasis was on microfinance, which gave small loans to the underprivileged. The ability of financial services to empower the underprivileged and advance economic development has been shown by the success of microfinance organisations like Bangladesh's Grameen Bank (Jolis & Yunus, 2003). With time, FI's purview grew to encompass a diverse array of financial services and goods, incorporating payment systems, insurance, and savings accounts. The founding of the Consultative Group to Assist the Poor (CGAP) in 1995 is among the key moments that changed the course of financial inclusion (FI), as it has been a driving force behind policy advocacy, research, and the sharing of best practices (Pearce et al., 2022).

The emergence of online financial services has signalled a shift in the direction of financial inclusion. Financial services are becoming more widely available and reasonably priced for those with low incomes thanks to mobile money platforms like M-Pesa in Kenya (Jack & Suri, 2014). There are many benefits associated with digital financial services, such as reduced transaction costs, greater convenience, and accessibility to remote locations (G20, 2016). Further advancing FI, the usage of fintech solutions has made it easier to create cutting-edge financial goods that are suited to the requirements of marginalized communities (Arner, Barberis, & Buckley, 2015).

In India, the journey of FI can be traced back to the 1969 bank nationalisation, which intended to provide financial services to underserved and rural areas. 1975 saw the founding of Regional Rural Banks (RRBs), which further supported this objective by focusing on rural banking. The introduction of technology-driven solutions like digital payments and mobile banking has revolutionized FI in India, increasing the affordability and accessibility of financial services (Padmakar, 2018). The Aadhaar biometric identification system, launched in 2009, has been essential in making financial inclusion possible by providing a unique identity to millions of Indians, facilitating the opening of bank accounts and providing government benefits (Perrigo, 2018).

Numerous legislative efforts and regulatory changes have also influenced the development of FI in India. Several measures have been implemented by the Reserve Bank of India (RBI) to facilitate financial inclusion (FI), like the publication of guidelines for financial literacy centres, the launch of simple accounts, and the extension of the business correspondent model (RBI, 2020). Government initiatives like the PMJDY, which attempts to give everyone access to banking services and encourage financial literacy, have supplemented these efforts (Ministry of Finance, 2023).

### 2.3. Status of Financial Inclusion and its impact in India

India has witnessed substantial progress in promoting FI over the past decade. The Global Findex Database (2021) reports that in India, the proportion of adults with bank accounts increased from 35% in 2011 to 80% in 2017. Government programs like the Pradhan Mantri Jan Dhan Yojana (PMJDY), which seeks to provide universal access to banking amenities, financial literacy, and insurance coverage, are largely responsible for this exceptional rise (Ministry of Finance, 2023). The RBI's Financial Inclusion Index shows consistent improvement in financial access, usage, and quality indicators, reflecting the successful implementation of FI policies (The Hindu, 2023).

Despite these advancements, challenges remain in achieving comprehensive FI in India. Issues such as financial literacy, digital infrastructure, and socio-cultural barriers continue to hinder the full integration of certain sections of society into the financial system (Sarma & Pais, 2011). For example, rural and remote areas still face difficulties in attaining banking services because of insufficient infrastructure and connectivity. Additionally, financial literacy levels remain low, particularly among women and marginalized communities, limiting their ability to effectively utilize financial services (Cole et al., 2011).

FI has a substantial impact on the economic expansion of India. The PMJDY has enabled millions of Indians to open bank accounts, thereby incorporating them into the established banking structure. This has facilitated the direct transfer of government subsidies and benefits, reducing leakages and ensuring that assistance reaches the intended beneficiaries (Drèze & Khera, 2017). Additionally, FI has improved economic activities by granting loans and other financial services access to small and micro enterprises, which are critical for job creation and economic growth (Sharma, 2016). The implementation of the Pradhan Mantri Fasal Bima Yojana (PMFBY) has provided farmers with crop insurance, mitigating agricultural risks and contributing to rural economic stability (Sharma, 2024). Burgess and

Pande's (2005) research demonstrates that increased access to banking services in rural areas led to significant improvements in agricultural productivity, income levels, and employment opportunities. Furthermore, it has been demonstrated that FI improves financial resilience, empowering households to handle emergencies and shocks to the economy more skilfully (Karlan et al., 2014). The availability of official banking services allows individuals to save, invest, and access credit, thereby fostering economic growth and development.

Morgan and Pontines (2014) studied how FI might improve financial stability by lowering the amount of non-performing loans and the probability that financial institutions will fail. Their study highlights the role of FI in promoting economic stability, particularly for small and medium-sized businesses. This aligns with findings by Sharma (2016), who found a link between FI and growth in the Indian economy, showing that increased availability of financial services leads to development in the economy. Allen et al. (2016) focused primarily on understanding ownership and the usage of formal accounts in their analysis of the FI underpinnings. They pointed out that although FI has the potential to have a big influence on economic growth, removing obstacles and fostering broad access will need concerted efforts by financial institutions and regulatory agencies.

### 2.4. Initiatives undertaken for Financial inclusion in India

Banks are the cornerstone of FI's efforts, as they provide essential financial services to underserved populations. Banks provide a range of goods, including lending, insurance, and savings accounts, to meet the needs of small businesses and individuals with low incomes (World Bank Group, 2013). Banks also are essential to financial education and literacy, helping individuals understand and effectively use financial products. Public sector banks in India, in particular, have been instrumental in driving FI initiatives, leveraging their extensive branch networks to reach remote and rural areas (Maity and Sahu, 2020).

Beyond just offering financial services and products, banks also contribute significantly to the advancement of financial inclusion. Banks are also essential in promoting consumer protection and financial literacy. Banks run financial literacy campaigns to educate others regarding the advantages of utilizing official financial services, how to manage their finances, and how to avoid financial frauds (Lusardi & Mitchell, 2014). Banks also implement measures to protect consumers, such as providing clear information about financial products, ensuring transparency in transactions, and addressing customer grievances (OECD, 2013).

Several initiatives by banks have significantly enhanced financial access. These include the expansion of branch networks in rural areas, the use of online banking services, and the deployment of banking correspondents who serve as a bridge between the unbanked people and the bank (Maity and Sahu, 2020). To increase the official financial system's reach, public sector banks are required to open a specific number of rural branches annually. Additionally, to supply cutting-edge financial services and solutions that specifically address the needs of marginalised communities, banks, and fintech start-ups have partnered (Arora & Ferrand, 2007).

Digital financial services (DFS) have transformed the landscape of FI by making financial services more accessible, affordable, and convenient. The advent of mobile banking, internet banking, and digital wallets has enabled millions of people to obtain banking services without going through actual bank branches (Suri & Jack, 2016). Mobile money services, like Kenya's M-Pesa, have shown the potential of DFS to reach underserved populations and promote financial inclusion (Jack & Suri, 2014). In India, digital payment platforms like the use of Paytm, Google Pay, and PhonePe have increased significantly, allowing cashless transactions and enhancing financial access.

The use of DFS offers several benefits, including lower transaction costs, increased convenience, and enhanced security. Real-time transactions are possible on digital platforms, which lessen the requirement for physical cash and reduce the risk of theft and fraud. Additionally, DFS provides a platform for innovative financial products including savings plans, microloans, and micro-insurance specifically suited to low-income people's demands (Klapper, El-Zoghbi, & Hess, 2016). The integration of DFS with traditional banking systems has further broadened the financial services' market reach, filling the void in the official and unofficial financial domains (G20, 2016).

The use of biometric identification systems, such as Aadhaar in India, has further enhanced FI by providing a unique identity to millions of individuals, facilitating the opening of bank accounts and access to government benefits (Perrigo, 2018). Blockchain technology is another promising innovation that holds the potential to promote FI through facilitating safe and open financial transactions, lowering the possibility of fraud, and boosting confidence in the financial system (Narayanan et al., 2016). To further advance FI, fintech companies are creating cutting-edge financial goods and services that particularly address the requirements of marginalized communities (Gomber et al., 2017).

Further, regulatory support and conducive policy framework are critical for the success of FI initiatives. The Reserve Bank of India (RBI) has played a significant role in this regard, issuing guidelines for financial literacy centres, launching basic accounts, and promoting the business correspondent model (The Hindu, 2023). Government initiatives like the PMJDY, which aims to provide universal access to banking services and promote financial literacy, have supplemented these efforts (Ministry of Finance, 2023). These policies have been instrumental in expanding financial access and integrating marginalized communities into the formal financial system.

One notable initiative is the introduction of the Jan Dhan-Aadhaar-Mobile (JAM) trinity, which leverages technology to promote FI. The JAM trinity integrates the PMJDY bank accounts, Aadhaar biometric identification, and mobile banking, facilitating the direct deposit of government rewards into the financial statements of recipients (Ministry of Finance, 2023). This program has improved financial accessibility, in addition to reducing corruption and leakages in the delivery of government subsidies. Another significant development is the issuance of small finance bank licences by the RBI, aimed at serving the unbanked and underbanked population (The Hindu, 2023).

### 2.5. Financial Inclusion efforts and Agriculture credit

According to Abu and Issahaku (2017), there is a favourable correlation between FI and economic activity in the agricultural sector, as evidenced by the good impact of FI on agricultural commercialization in Ghana. Their findings align with international best practices that promote targeted online financial services and microfinance initiatives to enhance FI. Wang and He (2020) identified the inclusion of digital finances as an effective strategy for alleviating financial constraints faced by vulnerable farmers in rural China. Their study highlighted the importance of leveraging technology to promote FI and enhance agricultural productivity. Farooq et al. (2021) highlighted the positive effect of FI on agricultural output and growth in Pakistan, noting that access to credit and financial services significantly enhances agricultural activities. This was supported by the findings of Peprah et al. (2020) that FI significantly enhances smallholder farmers' productivity by providing availability of financial services and credit. Similarly, Dong et al. (2012) discovered that the elimination of financial constraints in rural China led to a substantial increase in household productivity. Sonehekpon and Fiamohe (2022) discussed the importance of promoting

finance policies for agriculture that provide low-interest, long-term loans to reduce information asymmetry in agricultural credit markets, further promoting FI among farmers.

Research shows that formal agricultural credit is essential for enhancing farm productivity and well-being by enabling investment in new technologies and improving living conditions. Many studies define agricultural credit as a tool for financing farm production, with Nwaru (2004) and Danso-Abbeam et al. (2016) describing it as essential for economic activities in agriculture. Access to credit has proven vital for improving farm productivity, increasing income, and reducing poverty, though it remains limited for many rural communities. Hu et al. (2021) examined how FI affected China's agriculture total factor increased productivity, underscoring the significance of FI in enhancing agricultural development. Similarly, Liu et al. (2022) found that FI contributes to improvements in agricultural overall factor productivity by financing rural areas' industrialized industries.

Kokoye et al. (2013) and Saqib et al. (2016) highlight how credit positively impacts farm households, while studies by Ajagbe (2012) and Etonihu et al. (2013) identify socioeconomic factors like education, land size, and access to financial institutions as significant determinants of credit demand and access. For smallholder farmers, studies from Dube et al. (2015) in Zimbabwe and Saqib et al. (2016) in Pakistan reveal that credit access is often constrained by farm size, educational background, and distance from banks, with smaller farmers facing the greatest barriers. In Germany, Fecke et al. (2016) found that loan demand is influenced by interest rates and repayment terms, while Agbodji and Johnson (2019) in Togo reported that in-kind credit improves yields of certain crops like maize and sorghum. This literature underscores the need to address access barriers and strengthen institutional roles to improve financial inclusion for smallholder farmers.

However, researchers like Ellis (1992) and Akram (2008) found that some agricultural credit is diverted to non-farm uses, including festivals and general household expenses. In Pakistan, collateral requirements hinder smallholder farmers from accessing formal credit, forcing them to rely on informal sources, which offer flexible terms and timely disbursement (Rahman et al., 2014). A Study by Saqib et al. (2018) reports that small farm holders typically use minimal credit for inputs like seeds and fertilizers due to limited collateral, the inability to afford machinery and larger investments. The literature also explores how socioeconomic factors such as age, income, education, and experience affect credit access (Abedullah et al., 2009; Saqib et al., 2018), with landholding size being particularly

important. External risks, including floods and market instability, further challenge farmers, who lack a supportive credit policy during crises (Saqib et al., 2018).

# Chapter 3 – Methodology

The methodology chapter outlines the research design, data collection methods, and analytical techniques employed in this study. A quantitative approach is adopted, relying on primary data collected through structured surveys administered to a sample of farmers across ten districts. The chapter details the sampling strategy used to ensure a representative selection, alongside the procedures followed for data collection and validation. To analyse the data, a range of statistical techniques are utilised like Descriptive statistics which provide an overview of the sample's demographic and socio-economic characteristics, while probit regression, ANOVA and chi-square tests are applied to test hypotheses about income and other variables.

## 3.1 Research gap

- Numerous studies have been conducted outside India in the context of financial inclusion and agricultural credit. But only a few pieces of research have been done in the Indian context (R.L. & Mishra, 2022; Kumar, et al., 2013; das, 2018).
- Studies have attempted to identify the determinants of microfinance credit access to smallholder farmers by taking a single source of financial credit (Ouattara, et al., 2019).
- According to the government report (SLBC), there is disequilibrium in credit access among the farmers, who are basically from the tribal region.
- Regarding the role of commercial banks: public, private, and foreign in the eastern portion of India, only a limited amount of research has been conducted.

- The present study addresses the gap and will focus on the credit constraints faced by small-scale farmers in the weaker sections and the various determinants influencing their ability to obtain credit from formal financial institutions, whether public, private banks or foreign, co-operatives and RRBs in the context of increasing the farmer's performance.

## 3.2 Research Questions

RQ1: Does a relationship exist between credit constraints and farmers' agricultural performance?

RQ2: do determinates of farmers influence the credit flow to agricultural households?

RQ3: Are financial institutions' present policies enough to reduce credit distress and agricultural productivity?

### 3.3 Objectives of the study

After reviewing various research papers, the following broad objectives are:

- To analyse various indicators which affect the credit flow to the agriculture sector.
- To analyse credit constraints faced by the farmer.
- To examine the role of financial institutions on agricultural credit.

### 3.4 Relevance of the study

Financial inclusion can rise significantly along with GDP growth, and GDP growth can also increase the share of financial inclusion. For instance, a one per cent increase in GDP can result in a more than doubling in the financial inclusion index (Cicchiello et al., 2021). Credit accessibility is essential for the growth of the agricultural sector. Because nearly 60 per cent of our population depends on this single sector for sustenance, it assists farmers in utilising new and advanced technology to increase production. The National Statistical Office's 2021 report reveals that farm household income per day is only approximately 277, which is less than the average daily wage in India. On the other hand, it is erroneous to assert that the government has not taken a variety of measures to reduce this barrier faced by this sector. The government establishes numerous institutions to mitigate the issue of credit accessibility. Nonetheless, the statistical report reveals that some areas of a particular region receive a substantial amount of credit while others are severely neglected. Consequently, the relevance of this study was to identify the various factors influencing credit availability.

### 3.5 Scope of the Study

This study focuses on strengthening the economic position of the agricultural household by identifying the major challenges that the agricultural household faces with the agricultural credit that the government provides to enhance the productivity of the primary sector. This study was conducted in multiple regions of Odisha to determine the various source of finance and identify the various constraints the farmer's face and multiple indicators that play a significant role in accessing credit. Further, the study also focuses on identifying the role of financial institutions in agricultural credit from the perspective of bankers.

### 3.6 Research Methodology

Odisha is located on the eastern coast of India along the Bay of Bengal. Agriculture is the dominant sector of the state economy providing employment and sustenance, directly or indirectly, to more than 60 percent of total work force. In order to evaluate the access to credit in the tribal belts of Odisha, the study adopts both qualitative and quantitative approach of investigation within the most tribal populated districts of Odisha. The nature of the data was primary. The primary data was collected both from the loanee and non-loanee farmers. Method of data collection was survey from structured questionnaires was used to get value-added information. For the third objective, 35 samples from bank managers working in financial institutions were collected through the mode of a schedule.

The primary data was collected using questionnaires, taking household-level details and individual details into consideration. In household-level data, there are location details, respondent profiles, household profiles, household asset portfolios, household consumption expenditures, household income, savings and investments, loans and borrowings, microfinance experiences. In individual level details, there is detail regarding the respondent's demographic profile.

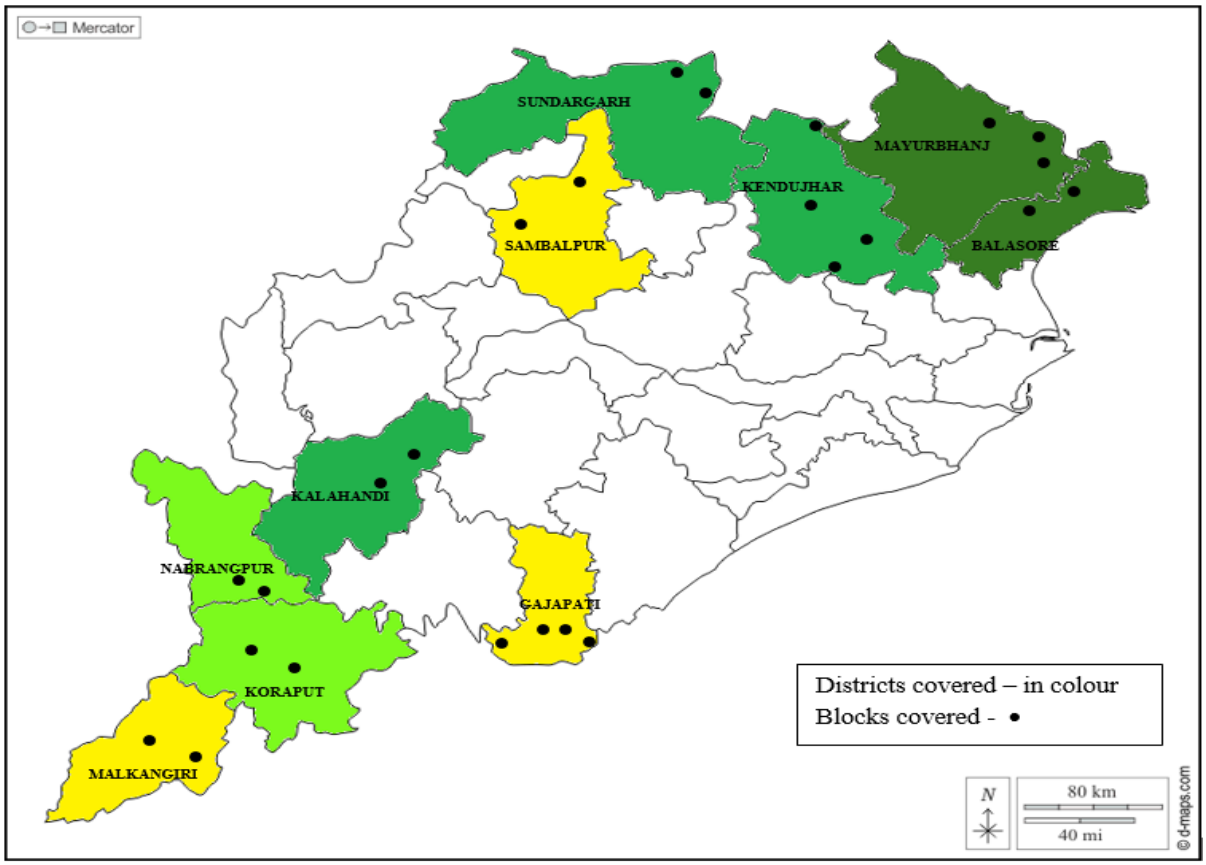



**Figure 3.1** Sample districts and blocks covered in the study

### 3.7 Sampling:

#### i. Selection of district:

- The districts were selected based on the highest number of operational holdings in their respective regions. Odisha is divided into three distinct regions: central, southern, and northern. Each of the districts was selected based on the highest operational land holding.
- This study considered the tribal districts of Odisha because most of the populations of these districts are backward and also because credit flow to these areas is very low.
- Data was collected from small and marginal farmers based on socioeconomic, demographic, and personal characteristics of farmers and land holding pattern (up to one-two hectare of agriculture land) from the tribal belt.
- Data collection will also include semi-medium (2-4) and medium farmers (4-8 hectares) from tribal and non-tribal belts (Ministry of Agriculture & Farmers Welfare).

#### ii. Selection of village:

- The selection of villages was based on the non-probability sampling method. A total of five villages from each district were selected for sample collection. Villages are classified into the following categories:
- Villages with fewer than 250 households by March 31, 2011
- Villages with populations greater than or equal to 250, with towns in Tiers 3 to 6.
- Selection of households: A sample of more than 10 households was selected from each village, and households were divided into the following categories:
  - Households those are completely un-indebted.
  - Households that borrow money only from informal sources.
  - Households take loans from both formal and informal sources.

#### iii. Sampling unit:

- For the construction of the sample size, we are using Yamane's formula for sample size:$n = \frac{N}{1+N*(e)^2}$

  Here, "n" stands for sample size, "N" stands for total population size, and "e" stands for the level of precision.
- By using Yamane's formula, the sample size for our study is 385, but 1036 samples was collected from 10 districts of Odisha, which are coming under three divisions.
- A total of more than 100 samples from each district were collected for the study.

**Research sample collected for Odisha:** Primary data is gathered from ten tribal districts of the state, namely Balasore, Sundergarh, Koraput, Keonjhar, Sambalpur, Mayurbhanj, Malkangiri, Gajapati, Kalahandi and Nabrangpur. A total of 25 blocks were selected from ten districts, 94 Gram panchayats and 116 villages were covered in the survey. Figure 3.1 depicts the chosen blocks and districts for the study and Table 3.1 provides the detailed description of the districts covered in the survey.

**Table 3.1** Particulars about the survey districts

| Districts | Sample Collected | Blocks | Gram panchayats | Villages |
|---|---|---|---|---|
| **Keonjhar** | 130 | Champua | Champua, Rajia | Ramla, Panchapokharia, Ramla, Maheswarpur, Kanchanpur,Sasang, Patala |
| | | Harichandanpur | Thakurpada, Bhonrpur, Sunapenth, Badapalaspanga, Dhuradiamba, Budhakhaman | Bayapita, Ghosatangar, Madhyapur, Bnabir, Gopinathpur, Prahaladpur, Jamuda, Jamuposi, Budhkhama, Sharatangiri, Nalapanga |
| | | Sadar | Palaspanga, Bauripada, Kandraposi, Nuagaon, Prajanpur | Murusuna, Palaspanga, Bauripada, Mukuna, Kusapada, Mahadebpur, Kandraposi, Nuagaon, Prajanpur, Deuladhia, Patung |
| | | Ghatagaon | Badamasinabilla, Dhenkikote | Sanamasinabilla, Sanabarbeda, Tikira, Dhenkikote, Kapasapada |
| **Sambalpur** | 107 | Sambalpur Sadar | Sambalpur Municipality Corporation Area | Gadmunda, Mahammadpur, Singhpali, Dengsari, Larpank, Sardhapali, Gopalpali, Gambharkanta, Kultanuapali, Sindurpank and Themra |
| | | Kuchinda | Khandakota, Ararbahal, Satkama, Boxma, Salebahadi and Kuchinda. | Lad, Khandakota, Routbahal, Ararbahal, Thakurniktipal, Hadipal, Saleibahad, Chandinimal and Kuchinda |
| **Mayurbhanj** | 105 | Kuliana | Kuchei, Ketunamari, Gaudrama, Gangaraj, Kuliana and Nodhan, | Darkholi, Khadibani, Kukudakhumpi, Kulipala, Sunaposi, Salugadia, Sansarposi, Badhaldiakan and Titiri |
| | | Suliapada | Fanaia, Kujidhi and Kostha | Chakchkia, Tilaposi, Rasunia, Jhalmaria, Asanbani, Gopi Bandha and Badabanicha |
| | | Moroda | Neechuapada and Kuhi | Baliadhia, Neechuapada |
| **Gajapati** | 101 | Gumma | Ukhara, Porida, Brushava, Badakalakote | Lakisara, Tarangada, Sari, Parida, Adanguda, Alaida, Badakalakote, Bangidising |
| | | Kasinagar | Sidhamadanga | Sidhamadanga, Nilakanthapur, Bada Poluru, Chitrakar Kaxmipur, Parsurampur |
| | | Gosani | Bomika | Badadeula, Bomika, Chintapali, Sailada |

| | | | | |
|---|---|---|---|---|
| | | Rayagada | Narayanpur | Lalusahi, Sebakpur |
| **Kalahandi** | 102 | Bhawanipatna | Chahagaon, Chheliamal, Karlapada, Kuliamal, Kamthana, Kalam, Risigaon, Malgaon | Chahagaon, Budhipadar, Chheliamal, Karlapada, Kuliamal, Kamthana, Karlasoda, Dumal, Balijor, Badkhairmal, Chandopala, Bargaon, Kalam, Tikrapada, Kerokuda, Risigaon, Kusumdar, Malgaon and Phatapada |
| | | Kesinga | Utkela, Kikia, Chancher, Boria | Utkela, Kadopada, Kokadmal, Gohirpadar, Chancher, Chicharla, Khajuripada |
| **Balasore** | 105 | Remuna | Patripala, Ganipur, Natakata | Hatiagand, Nuagaon, Patripal, Pandasai, Bidyadharpur, Kanrali, Khandapasa, Shyamsundarpur, Badacharigan, Kothacharigan, Bela |
| | | Basta | Badpal, Velora, Barunagadia | Kashimpur, Mayurgram, Gopalpur, Badapal, Srikrushnapur, Baniamari, Santoshpur, Kuladhia, Velora and Nischintapur |
| **Nowrangpur** | 96 | Nandahandi | Sindhiguda,Suruguda , Dangarbheja, B Maliguda | Dangarbheja, B. Maliguda, Suruguda, Sagarmunda |
| | | Papadahandi | Maidalpur, Papdahandi | Mundaguda, Bankasargi, Patroguda, Janguda |
| **Malkangiri** | 110 | Malkangiri | Malkangiri, Sindhrimal, Goudaguda, Pendakonda, B.L.PUR, Markapali | Malkangiri, Sindhrimal, Goudaguda, Pendakonda, B.L.PUR, Markapali |
| | | Kourkonda | Potrel, Mariwada, Tarlakota, Kourkonda, Tumusapally | Potrel, Mariwada, Tarlakota, Kourkonda, Tumusapally |
| **Koraput** | 103 | Koraput | Podagada, Mahadeiput, Padampur, Mastiput, Gadiaguda, Dhanpur, Mahadeiput | Podagada, Mahadeiput, Padampur, Mastiput,Gadiaguda, Dhanpur, Mahadeiput |
| | | Jeypore | Kumuliput, Ranigarh, Umri, Phampuni, Dongerchinchi, Anta | Kumuliput, Ranigarh, Umri, Phampuni, Dongerchinchi, Anta |
| **Sundergarh** | 77 | Bisra | Bisra, Urusu, Draeikela and Badabambua | Bad Bambua, Ganjutola, Masurikudar, Bada Bringajhar, Kulenbahal, Jodabandh, Dreikela, Bhumijtola, Purna Bisra, Budeljore and Sarubahal |
| | | Nuagaon | Khutgaon and Limida | Khuntgaon, Koelsuta, Bispur |
| Total | **1036** | **25** | **94** | **116** |

***Source:*** ITDA, https://stsc.odisha.gov.in/about-us/tribal-concentrated-block-list

1. The present study is based on primary data, collected from ten districts of 1036 sample households, relating to various parameters such as participant's name, their demographic profile like sex, age, education qualification, family size, annual household income,

agricultural production, and some more information collected through well designed, structured questionnaires and interviews.

2. The questionnaire is prepared with 38 questions which are mentioned in the appendix area. The people contacted for the informal communication with the researcher, prior to the data collection. The structured questionnaire is both qualitative and quantitative regarding the participant's agricultural information.
3. The data was analysed quantitatively as well as qualitatively. For graphical representations and tables, the cumulative percentage has been computed. Interview data was also qualitatively analysed, which included quantitative reports.

### 3.8 Method adopted

The study used methods like descriptive statistics, ANOVA (Analysis of Variance), chi-square tests and ordered probit regression with sample selection for the study. Descriptive statistics summarize and describe the main features of a dataset, providing a quick overview of its central tendency, variability, and distribution. These statistics are crucial for understanding data patterns and making preliminary observations before diving into more complex analyses. ANOVA is a statistical method used to compare means across multiple groups to determine if there are any statistically significant differences between them (Kao and Green, 2008; Judd et al., 2017). It is particularly useful when comparing three or more groups or levels of a categorical variable, as opposed to a t-test, which compares only two groups. The core idea of ANOVA is to partition the observed variation in data into components attributable to different sources, helping to identify whether the variation between group means is greater than would be expected by chance. A chi-square test is a statistical test used to examine whether there is a significant association between two categorical variables (Franke et al., 2012; Rana and Singhal, 2015). It compares the observed frequencies of categories in a contingency table to the frequencies expected if there were no association between the variables.

Prior studies have used several econometric methods to identify the determinants of agricultural credit. Ordinary least square regression and simple Probit (Sarap, 1990; Chandio & Jiang, 2018; Zulfiqar *et al.*, 2021) or Tobit estimations (RL & Mishra, 2022) were the most commonly used methods. The most common underlying problem is that these methods especially OLS are not a fit for the data as the dependent variable is the amount borrowed and the zero value of the dependent variable may not be arbitrary as it might be because of the lack of access to credit or unwillingness to access credit (Kumar *et al.,* 2021; RL & Mishra,

2022). To address these issues, the Heckman selection model was used by studies (Kumar *et al.*, 2021; RL & Mishra, 2022). The probit and logistic regression models are designed to analyse regression frameworks with a binary dependent variable, where the variable takes the value of 1 for "yes" and 0 for "no." Of the two models, researchers often prefer the probit regression model over the logistic regression model. This preference is due to the normality assumption of the probit model, which allows for a more straightforward analysis of specification problems thanks to the properties of the normal distribution (Wooldridge, 2006). Additionally, the probit model can address heteroscedasticity and constrain the predicted probabilities to lie between 0 and 1 (Chandio & Jiang, 2018). Since the study uses dummy variables and ordinal variable for selection and outcome equations respectively, the study used an ordered probit model with sample selection to identify agricultural credit determinants in the state of Odisha, India. It helps to overcome the sample selection bias at first and then it helps to address the ordinal nature of the dependent variable (De Luca & Perotti 2011; Pal & Laha, 2015). The choice of the model was based on the particular characteristics of the data, as the data is censored.

There exists a selection equation and outcome equation in the case of the Heckman model. The Loanee is the dependent variable of the selection equation, which explores the factors affecting the decision of the farmer to access credit or not. The farmers who have accessed credit would be selected only to the next step, which is the outcome equation. The dependent variable of the outcome equation is the ordinal variable depicting the Loan amount, which are the various classifications of the amount borrowed by the farmer. Only the farmers who have accessed credit in the first equation would be selected for the outcome equation and the factors impacting the amount borrowed by the farmers will be assessed in this equation. The outcome and selection equations (Alemi et al., 2019; Lanfranchi et al., 2019) are given below;

Outcome equation:

$Loan\ Amount^*_i = x_i \beta + \varepsilon_i$

$Loan\ Amount_i = j\ if\ \mu_{j-1} < Loan\ Amount^*_I \leq \mu_j$

$(Loan\ Amount_i, x_{i)}\ observed\ when\ Loanee_i = 1$

Selection equation:

$Loanee^*_i = z_i \gamma + u_i$

$Loanee_i = 1\ if\ Loanee^*_i > 0,\ Loan\ Amount_i = \mu_{j-1} < Loan\ Amount^*_I \leq \mu_j$

$Loanee_i = 0\ if\ Loanee^*_i \leq 0,\ Loan\ Amount_i\ unobserved$

Where the Loanee* is the variable that indicates whether the loan is accessed or not $z_i$ is a vector of variables determining the selection process; $\gamma$ the parameters to estimate; *Loan Amount* is the amount of agricultural credit borrowed; $x_i$ shows the vector of variables that determines the outcome Loan amount; $\beta$ the parameters to estimate; $u_i$ and $\varepsilon_i$ are the errors terms of the two equations.

Further, the study has used simple descriptive statistics like mean, percentages, and frequencies to analyse the demographic characteristics and determinants and constraint level factors impacting the agricultural credit access by farmers. Moreover, the study used chi-square test to analyse any differences exist in the differences in factors like income, education, caste and district on the various credit constraints experienced by people who have availed credit in the sample. All the analysis was undertaken with EXCEL and STATA software packages.

### 3.9 Variables of the study

***Dependent variable***

Agricultural credit: The major dependent variable of the study is the loan availed (LOANEE) and the loan amount (LOAN_AMT). The LOANEE is a dummy variable that measures whether a farmer has taken agricultural credit or not. If the farmer has taken credit, then the value is one and if not taken it is zero. The LOAN_AMT is the natural logarithmic transformation of farmers' loan amounts.

***Explanatory variables***

*Age:* Age is measured in years as the continuous variable. Younger people are expected to have more credit access than older people. The chances of the ageing population lacking efficiency and productivity could affect their repayment capacity and reduce the loan amount available (Chandio *et al.,* 2020).

*Education:* Education is measured as a categorical variable with six classifications. Education significantly impacts farmers' access to and utilization of agricultural credit by improving financial literacy, risk management, and the adoption of modern farming practices. Educated farmers are better equipped to navigate the application process, negotiate terms, and utilize credit effectively, which enhances their creditworthiness and overall financial stability. Hence, the higher the education, the higher the access to credit and the higher the amount received.

*Social class:* It represents whether a farmer belongs to the SC or ST class. Social class, particularly among SC and ST, significantly impacts access to agricultural credit. Members of SC and ST communities often face systemic barriers such as limited land ownership, lower financial literacy, and discrimination, which result in reduced access to formal credit sources and smaller loan amounts.

*Gender:* Gender is measured as a dummy variable, in which 1 represents the male and 0 represents the female. Gender impacts agricultural credit access, with women often facing more significant barriers than men. These barriers include limited land ownership, which affects collateral availability, and lower financial literacy and access to credit information, leading to reduced loan approvals and smaller loan amounts for female farmers. Hence, gender disparities could impact access to loans.

*Occupation*: Occupations other than farming can impact access to agricultural credit by diversifying a farmer's income sources, which can enhance their creditworthiness and repayment capacity in the eyes of lenders. Non-farming income provides financial stability, reducing the perceived risk for lenders and potentially leading to larger loan amounts or better loan terms. However, if non-farming occupations dominate, lenders might view the farmer as less committed to agriculture, potentially influencing the loan approval process.

*Family System:* The type of family system, whether joint or nuclear, impacts access to agricultural credit by influencing financial stability and risk assessment. In joint families, the pooled resources and collective income can enhance creditworthiness and provide better collateral, potentially leading to higher loan amounts. Conversely, nuclear families might have fewer collective resources, which could limit their access to credit or result in smaller loan approvals.

*Farmer ratio:* The higher number of family members in farming can indicate greater labour availability and potentially higher productivity, making lenders more likely to approve larger loan amounts. Conversely, fewer family members in farming might signal limited labour resources, which could lead to lower creditworthiness and smaller loan approvals.

*Income:* Household income impacts agricultural credit as higher income level indicate greater repayment capacity, making lenders more willing to approve loans and potentially offer larger amounts. Conversely, lower household income can increase the perceived risk for lenders, leading to smaller loans or higher interest rates.

*Operated Area:* The size of the farm area that influences agricultural credit by serving as an indicator of potential agricultural productivity and income. Larger farm areas can enhance creditworthiness by suggesting higher output and revenue, whereas smaller farms may be viewed as less economically viable, potentially resulting in reduced credit access.

Land: Owning land significantly impacts agricultural credit access since land can be used as collateral, reducing the risk for lenders and increasing the likelihood of loan approval. Farmers without land ownership often struggle to secure loans due to the lack of collateral, limiting their access to formal credit sources.

*Equipment*: Ownership of agricultural equipment affects credit access by indicating the farmer's capacity for efficient and productive farming. Farmers with modern equipment are perceived as more capable of achieving high yields, which can enhance their creditworthiness and lead to larger or more favourable loans. Lack of equipment may suggest higher operational risks, affecting loan approval and amounts.

*Credit Source:* The source of credit impacts the terms and accessibility of agricultural loans. Formal credit sources, such as banks, typically offer lower interest rates and better terms but require more stringent documentation and collateral. Informal sources, like moneylenders, might offer easier access but at higher interest rates and less favourable conditions. Farmers' choice of credit source can thus influence their overall debt burden and financial stability.

*Distance:* The distance from financial institutions affects agricultural credit access as greater distances can pose significant barriers due to higher travel costs and time commitments for farmers. Proximity to banks and financial institutions facilitates easier application and follow-up processes, thereby improving the likelihood of obtaining credit.

*DBT:* Direct Benefit Transfer (DBT) impacts agricultural credit access by ensuring timely and transparent disbursement of subsidies and financial aid directly into farmers' bank accounts. This can improve their financial standing and creditworthiness, making it easier for them to secure loans from formal financial institutions.

*KCC:* The Kisan Credit Card (KCC) scheme impacts agricultural credit access by providing farmers with a simplified and flexible credit line to meet their agricultural and allied need. It streamlines the borrowing process, reduces dependency on informal credit sources, and often offers lower interest rates, enhancing farmers' ability to access necessary funds.

*Jan Dhan Account*: The Pradhan Mantri Jan Dhan Yojana (PMJDY) accounts impact agricultural credit access by promoting financial inclusion and bringing more farmers into the formal banking system. Having a Jan Dhan account facilitates easier access to financial services, including credit, as it ensures that farmers have the necessary banking infrastructure to receive and manage loans.

*Krishi Mela*: Participation in Krishi Melas (agricultural fairs) impacts agricultural credit access by providing farmers with valuable information on various credit schemes, financial products, and modern agricultural practices. These events can connect farmers with financial institutions, enhancing their awareness and understanding of available credit options and improving their chances of obtaining loans.

*Irrigation Status*: Irrigation status impact agricultural credit access by influencing the perceived reliability and productivity of farming operations. Farms with reliable irrigation systems are seen as more stable and capable of producing higher yields, which enhances their creditworthiness and likelihood of securing loans. Conversely, farms without adequate irrigation might be considered higher risk, affecting loan approval and terms.

*Interest:* A dummy variable for high-interest rate perception impacts agricultural credit by reflecting farmers' reluctance to borrow due to the perceived cost of credit. If many farmers perceive interest rates as high, it can lead to reduced demand for formal loans, pushing them towards informal credit sources with potentially more unfavourable terms.

*Bank Correspondent:* A dummy variable for the presence of a bank correspondent impacts agricultural credit by indicating improved access to financial services for farmers in remote or underserved areas. Bank correspondents act as intermediaries, facilitating banking transactions and credit applications, thereby enhancing the likelihood of farmers obtaining agricultural loans.

*Districts:* District dummies should be kept while analysing access to agricultural credit because they account for unobserved district-specific factors that may influence credit availability and accessibility. The data was collected from ten districts; hence nine dummies were kept in the regression. Table 3.2 depicts the variables of the study along with its description and measurement.

**Table 3.2** Variables of the Study

| Variables | Description | Measurement | References |
|---|---|---|---|
| ***Loanee*** | Loan availed or not | Dummy variable;<br>Loan availed -1; otherwise- 0 | Kumar *et al.*, 2021; Zulfiqar et al., 2021; RL & Mishra, 2022 |
| ***Loan Amount*** | Classification of loan amount availed | Categorical variable with five classifications;<br>1 - Below 50,000<br>2 - 50,000 - 100,000<br>3 - 100,000 - 200,000<br>4 - 200,000 - 300,000<br>5 - Above 300,000 | Kumar *et al.*, 2021; RL & Mishra, 2022 |
| ***Age*** | Age of the farmer (Years) | Continuous variable;<br>The natural logarithmic transformation of the age is used. | Khandker & Faruqee, 2003; Kumar *et al.*, 2007; Kumar *et al.*, 2017; Ojo & Baiyegunhi, 2020; Asiamah et al., 2021; Zulfiqar et al., 2021 |
| ***Education*** | The education level of the farmers | Categorical variable with six classifications;<br>0- Illiterate<br>1- Below primary<br>2- Primary<br>3- Matric<br>4- Secondary<br>5- Graduation | Kumar *et al.*, 2007; Kumar *et al.*, 2017; Asiamah et al., 2021; Kumar *et al.*, 2021; RL & Mishra, 2022 |
| ***Social Class*** | The social group to which the farmer belongs. | Dummy variable for two major social groups;<br>SC (Yes - 1; No - 0)<br>ST (Yes – 1; No - 0) | Kumar *et al.*, 2007; Sarap, 1990; Kumar *et al.*, 2017; Kumar *et al.*, 2021 |
| ***Gender*** | Gender of the farmer | Dummy variable;<br>Male -1; Female -0 | Kumar *et al.*, 2007; Kumar *et al.*, 2017; Ojo & Baiyegunhi, 2020; Asiamah et al., 2021; Kumar *et al.*, 2021; Behera & Behera, 2024 |
| ***Occupation*** | The farmer has other jobs other than farming | Dummy variable;<br>Farmer has other jobs – 1;<br>Only farming - 0 | Kofarmata & Danlami, 2019; Ojo & Baiyegunhi, 2020; RL & Mishra, 2022 |
| ***Family Size*** | Household size | Continuous variable;<br>The number of family members in a household. | Kumar *et al.*, 2007; Sarap, 1990; Ojo & Baiyegunhi, 2020; Asiamah *et al.*, 2021; Kumar *et al.*, 2021 |
| ***Family System*** | Family System | Dummy variable;<br>Joint family -1; otherwise- 0 | Lokesh & Hawaldar, 2018 |
| ***Farmers Ratio*** | The average | Continuous variable; | Sarap, 1990 |

| | | | |
|---|---|---|---|
| | family member into farming | The ratio of the number of farmers in a family to family size | |
| ***Income*** | Average annual income | Continuous variable;<br>The natural logarithmic transformation of the annual income of the family. | Asante-Addo et al., 2017; Kumar *et al.*, 2017 |
| ***Operated Area*** | Area of land used for agriculture | Continuous variable;<br>The hectares of land used for farming | Sarap, 1990; Kumar *et al.*, 2007; Guirkinger & Boucher, 2008; Ojo & Baiyegunhi, 2020; Kumar *et al.*, 2021; Zulfiqar et al., 2021; |
| ***Land*** | Value of land owned by farmer | Continuous variable;<br>The logarithmic transformation of the value of land held by the farmer | Aditya et al., 2019; Zulfiqar et al., 2021 |
| ***Equipment*** | Value of equipment used | Continuous variable;<br>The logarithmic transformation of the value of equipment held by the farmer | Sarap, 1990 |
| ***Credit Source*** | Source of credit | Ordinal variable;<br>1 - Co-operative banks/ societies<br>2 - Scheduled commercial bank<br>3 - Rural banks<br>4 - Microfinance/SHG<br>5 – Multiple sources or others | Hussain & Thapa, 2012 |
| ***Distance*** | Distance between farmers and financial institution | Continuous variable;<br>The distance between farmer households and financial institutions in Kms. | Pal & Laha, 2015; Chandio & Jiang, 2018; Chandio et al., 2020; Ojo & Baiyegunhi, 2020; Zulfiqar et al., 2021 |
| ***DBT*** | Direct benefit transfer | Dummy variable;<br>Received DBT -1,<br>Otherwise - 0 | Aditya et al., 2019 |
| ***KCC*** | Kisan Credit Card | Dummy variable;<br>If the farmer has KCC – 1;<br>Otherwise - 0 | Kumar et al., 2015; Aditya et al., 2019; Gulati & Juneja, 2019; RL & Mishra, 2022 |
| ***Jan-Dhan Account*** | Jan-Dhan Account | Dummy variable;<br>If the farmer has a Jan-Dhan account – 1; otherwise - 0 | Kumar et al., 2015; Aditya et al., 2019 |
| ***Krishi Mela*** | Participation in Krishi Mela | Dummy variable; I<br>f the farmer attended Krishi Mela -1; Otherwise - 0 | Aditya et al., 2019; Venkatraja & Prasad, 2019 |

| | | | |
|---|---|---|---|
| ***Irrigation*** | Irrigation status | Ordinal variable;<br>0 – Un-Irrigated<br>1 - Partially Irrigated<br>2 – Fully Irrigated | Pal & Laha, 2015; Behera & Behera, 2024 |
| ***Interest*** | Higher interest rates | Dummy variable;<br>If interest is high -1;<br>Otherwise - 0 | Chandio & Jiang, 2018; Yeasmin et al., 2024 |
| ***Bank Correspondent*** | Bank correspondent | Dummy variable;<br>If the bank correspondent is present -1; Otherwise -0 | Satish, 2012; Gulati & Juneja, 2019 |
| **Districts** | Districts the farmer belongs to | Dummy variable;<br>The dummy variable for each district | Kofarmata & Danlami, 2019; RL & Mishra, 2022 |

# Chapter 4 – Socio-economic characteristics of the sample household

This chapter provides an in-depth analysis of the socio-economic characteristics of the households included in the study. It examines various aspects of the sampled farmers' demographics, including gender, age, education, and caste, as well as household attributes like marital status, family size, and type of family system. Economic factors such as income levels, occupation, farm size, and access to credit are also explored to gain insights into the financial status and livelihood patterns of these households. By analysing these socio-economic indicators, this chapter aims to present a comprehensive profile of the sample households and highlight any patterns or disparities within the population. The information gathered here not only provides context for understanding the socio-economic background of the farmers but also establishes a foundation for assessing the factors that may influence income and credit utilisation in later chapters.

**KEY FINDINGS**

- **Predominance of Marginal and Small Farmers**
  - Over 80 per cent of farmers in Odisha fall into the marginal or small farmer category.
  - Approximately 90 per cent of these farmers rely solely on agriculture as their primary source of income, without any secondary source of livelihood.
- **Credit Availability**
  - Districts like Koraput, Nabrangpur, and Sundergarh have a higher number of farmers who have not availed of agricultural credit. In Nabrangpur, education levels are notably low, with nearly 75% of farmers having less than primary-level education.
- **Gender Disparities in Farming and Income**
  - Districts with a higher proportion of women farmers tend to experience lower income levels. For example, in Mayurbhanj, where women represent 85% of the farming population, incomes are clustered around the low-income level.
  - In Malkangiri, the high presence of marginal farmers is significantly contributed by female farmers.
- **Impact of Male Farmer Representation on Income**
  - Districts such as Sambalpur, Balasore, Gajapati, and Kalahandi, where male farmers

are more prevalent, tend to have higher income levels.

- Specifically, in Kalahandi, around 63% of farmers belong to an income group above Rs. 2 lakhs, indicating a higher income level compared to other regions.

➢ **Higher Income in Non-SC/ST Classes**

- In Balasore, about 95% of farmers belong to classes other than SC (Scheduled Caste) and ST, experiencing higher education levels and better income distribution.
- Despite Gajapati having a significant representation of ST farmers, most semi-medium farmers belong to other classes and have higher income levels.

➢ **Diverse Social Composition and Income**

- The people in the socially backward class are more coming under the marginal farmer category and experience lower income levels mostly.
- In Keonjhar, many farmers belong to the ST (Scheduled Tribe) category and are marginalized.
- Malkangiri has a comparatively higher presence of SC farmers, with farmers distributed among SC, ST, and other categories. The income distribution in Malkangiri remains an issue, with most farmers earning less than Rs. 50,000 or between Rs. 50,000 and Rs. 1 lakh.

## 4.1. Overall farmer characteristics in the study

As an agrarian state, Odisha has a predominantly rural workforce, with approximately 55% engaged in agricultural activities (Planning and Convergence Department, 2023). Agriculture remains the primary source of livelihood for a significant portion of the state's population. Therefore, developing the agriculture and allied sectors is crucial for enhancing farmers' incomes, eradicating poverty, and driving economic growth through forward and backward linkages and value-added activities. Table 4.1 and Figure 4.1 depict the overall number of farmers in the Odisha district. It provides a snapshot of the distribution of farmers across different districts, highlighting both the districts with the highest and lowest numbers of farmers. Districts like Ganjam, Balasore, and Mayurbhanj have the highest number of farmers, while districts like Deogarh and Jharsuguda have the lowest number of farmers.

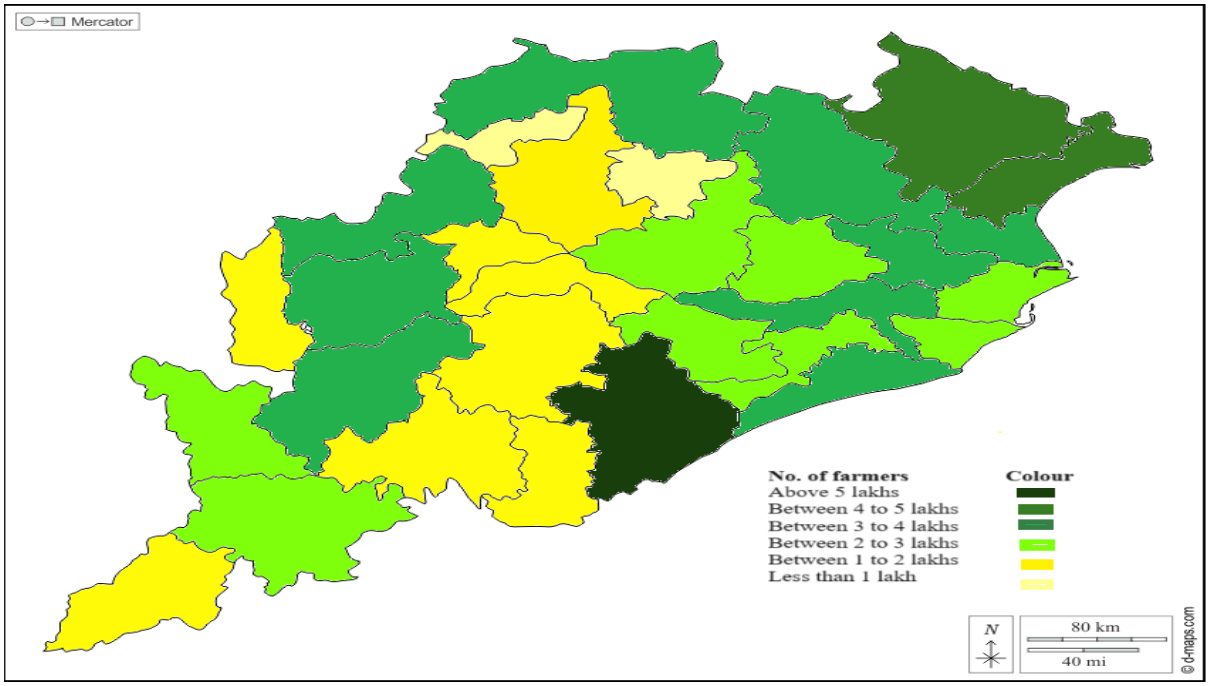



**Figure 4.1** Distribution of farmers across the districts in Odisha

Source: *https://krushak.odisha.gov.in/website/home*

**Table 4.1** List of farmers in Odisha

| District | No. of Farmers | District | No. of Farmers |
|---|---|---|---|
| *Ganjam* | 6,55,935 | *Dhenkanal* | 2,59,757 |
| *Balasore* | 4,94,274 | *Koraput* | 2,49,718 |
| *Mayurbhanj* | 4,69,965 | *Jagatsinghpur* | 2,33,929 |
| *Kalahandi* | 3,91,949 | *Khurda* | 2,29,854 |
| *Keonjhar* | 3,82,464 | *Nayagarh* | 2,11,246 |
| *Cuttack* | 3,80,802 | *Rayagada* | 1,90,652 |
| *Bolangir* | 3,68,939 | *Sambalpur* | 1,73,452 |
| *Jajpur* | 3,47,848 | *Kandhamal* | 1,66,669 |
| *Bargarh* | 3,44,473 | *Nuapada* | 1,51,915 |
| *Bhadrak* | 3,19,292 | *Sonepur* | 1,37,249 |
| *Puri* | 3,19,204 | *Malkangiri* | 1,28,716 |
| *Sundargarh* | 3,05,262 | *Gajapati* | 1,25,074 |
| *Kendrapara* | 2,89,920 | *Boudh* | 1,09,784 |
| *Angul* | 2,70,701 | *Deogarh* | 92,414 |
| *Nabarangpur* | 2,68,471 | *Jharsuguda* | 87,035 |

Source: *https://krushak.odisha.gov.in/website/home*

Figure 4.2 depicts the trends in institutional credit disbursement in India. There is a steady growth in the level of institutional credit disbursement throughout India. Table 4.2 shows the state-wise distribution of credit all over India. The southern region of India accounts for the highest percentage of institutional credit received, while the lowest levels of credit disbursement are in the case of the north eastern and eastern regions, respectively. Compared

to north eastern regions, the eastern region could be said to have larger disparities in credit distribution as the number of accounts comes to 12 per cent of the total; however, the credit disbursement is around 7 per cent only. This is contrary to the other regions where the percentage of amount disbursed is higher or more or less similar to the number of accounts.

Odisha has a higher proportion of Term Loan accounts (4.65%) compared to Crop Loan accounts (3.55%). This suggests a diversified need for financial support beyond just crop cultivation, possibly indicating investments in agricultural infrastructure and equipment. Despite the significant number of accounts, the amount disbursed for Crop Loans and Term Loans is relatively lower in proportion (1.67% and 2.08%, respectively) compared to other states. This could indicate smaller average loan sizes per account or perhaps a higher number of small-scale farmers requiring smaller loans. Overall, the Southern Region dominates the agricultural loan sector, with Odisha's loan disbursements being limited in comparison. For instance, Tamil Nadu alone accounts for 15.21% of crop loan accounts and 14.34% of the amount disbursed. The Western and Central regions also show higher disbursements compared to Odisha, reflecting a more substantial financial engagement in agriculture.

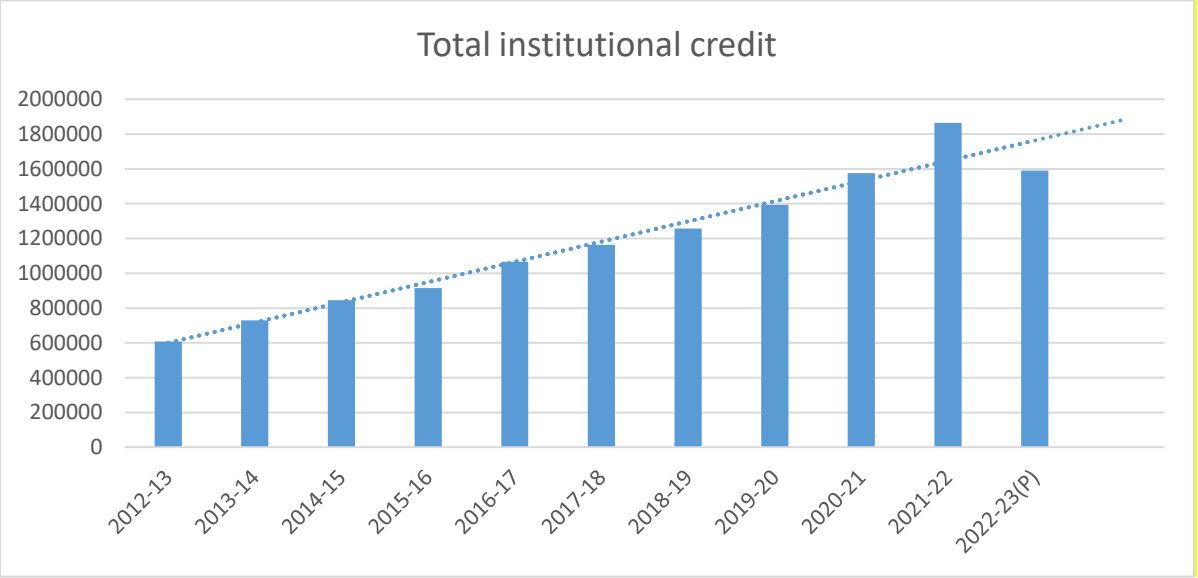



**Figure 4.2** Trends in institutional credit flow to agriculture sector

2022-23(P): Provisional as on 1st Jan 2023.

Source: Department of Agriculture & Farmers Welfare

The overall sample characteristics show that 84 per cent (872 farmers) of the farmers have availed of credit and only 15 per cent have not availed of credit. The female populace of farmers in the sample belongs to only around 30 per cent. The distribution of farmers shows a

significant disparity, with over 80% (837 farmers) categorised as marginal or small-scale farmers. This highlights that Odisha's rural population, which relies heavily on agriculture for their livelihood, remains poor and marginalised. They also mostly depend upon agriculture only as the main source of income, as around 90 per cent of the sample population depends on agriculture only as an occupation and does not have a secondary source of income.

Further, the farmers are more or less equally distributed among the age group between 30 and 60. However, in the case of education levels, around 75 per cent of the farmers have low education, i.e., less than matriculation level. Around 30 per cent of the farmers belong to ST, and about 56 per cent belong to general and OBC categories. Almost all the farmers (around 98%) are married and 80 per cent of the family belong to the nuclear system, with around 70 per cent of households having fewer than 5 family members. Regarding the annual income of the farmers, 60 per cent of farmers have less than Rs. 1 lakh annual income. Table 4.2 provides the details of the characteristics of the farmers in the entire sample of the study.

**Table 4.2** Overall farmer characteristics of the sample

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **498** | **339** | **162** | **32** | **5** | **1036** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 411 | 286 | 139 | 31 | 5 | 872 | 84.17 |
| **Not availed** | 87 | 53 | 23 | 1 | 0 | 164 | 15.83 |
| ***Gender*** | | | | | | | |
| **Male** | 261 | 259 | 151 | 32 | 4 | 707 | 68.24 |
| **Female** | 237 | 80 | 11 | 0 | 1 | 329 | 31.76 |
| ***Age (Years)*** | | | | | | | |
| **20-30** | 37 | 23 | 8 | 2 | 0 | 70 | 6.76 |
| **30-40** | 140 | 75 | 27 | 6 | 2 | 250 | 24.13 |
| **40-50** | 145 | 101 | 58 | 11 | 0 | 315 | 30.41 |
| **50-60** | 122 | 96 | 45 | 6 | 2 | 271 | 26.16 |
| **60 & above** | 54 | 44 | 24 | 7 | 1 | 130 | 12.55 |
| ***Education*** | | | | | | | |
| **Illiterate** | 76 | 31 | 8 | 0 | 0 | 115 | 11.10 |
| **Below primary** | 88 | 100 | 48 | 3 | 1 | 240 | 23.17 |
| **Primary** | 225 | 128 | 41 | 15 | 3 | 412 | 39.77 |
| **Matric** | 26 | 8 | 2 | 1 | 0 | 37 | 3.57 |
| **Secondary** | 59 | 47 | 43 | 5 | 0 | 154 | 14.86 |
| **Graduation & above** | 24 | 25 | 20 | 8 | 1 | 78 | 7.53 |
| ***Caste*** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ST** | 163 | 104 | 33 | 6 | 2 | 308 | 29.73 |
| **SC** | 62 | 48 | 26 | 3 | 0 | 139 | 13.42 |
| **Others** | 273 | 187 | 103 | 23 | 3 | 589 | 56.85 |
| ***Marital status*** | | | | | | | |
| **Married** | 479 | 336 | 161 | 30 | 4 | 1010 | 97.49 |
| **Others** | 19 | 3 | 1 | 2 | 1 | 26 | 2.51 |
| ***Annual Income*** | | | | | | | |
| **0 – 50000** | 215 | 52 | 10 | 1 | 0 | 278 | 26.83 |
| **50000 – 100000** | 183 | 130 | 44 | 3 | 0 | 360 | 34.75 |
| **100000 – 150000** | 63 | 94 | 16 | 1 | 0 | 174 | 16.79 |
| **150000 – 200000** | 21 | 30 | 15 | 3 | 0 | 69 | 6.66 |
| **200000 & above** | 16 | 33 | 77 | 24 | 5 | 155 | 14.96 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 410 | 269 | 123 | 22 | 3 | 827 | 79.83 |
| **Joint** | 88 | 70 | 39 | 10 | 2 | 209 | 20.17 |
| ***Family size (Nos.)*** | | | | | | | |
| **1 to 5** | 372 | 241 | 105 | 20 | 3 | 741 | 71.53 |
| **5 to 10** | 121 | 88 | 54 | 12 | 0 | 275 | 26.54 |
| **10 to 15** | 3 | 9 | 3 | 0 | 1 | 16 | 1.54 |
| **15 and above** | 2 | 1 | 0 | 0 | 1 | 4 | 0.39 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 429 | 315 | 150 | 27 | 5 | 926 | 89.38 |
| **Other occupation** | 69 | 24 | 12 | 5 | 0 | 110 | 10.62 |

*Source:* Data collected through survey

Table 4.3 depicts the sample characteristics that comprise 872 farmers who have availed credit, categorized into five credit brackets: below ₹50,000, ₹50,000 to ₹1 lakh, ₹1 lakh to ₹2 lakh, ₹2 lakh to ₹3 lakh, and above ₹3 lakh. Of the total, the majority (68%) are male, with a significant female representation (32%). Caste-wise, 59.4% belong to other castes, while 27.64% are ST and 12.96% are SC. Age distribution shows that most farmers fall in the 30-50 age range (55.27%), with fewer young farmers (5.62% in the 20-30 age group) and a smaller proportion over 60 (12.27%). Education levels reveal that a large segment (44.15%) completed primary education, with a smaller fraction pursuing higher education (8.60% are graduates or above).

A significant majority of the farmers (98.17%) are married, and most belong to nuclear families (80.28%). Income distribution highlights that a third (33.72%) has an annual income between ₹50,000 to ₹1 lakh, while 25.57% earn below ₹50,000, and only 16.86% have incomes exceeding ₹2 lakh. The predominant family size is 1-5 members (71.79%), and 88.07% rely solely on farming, while a minor portion (11.93%) are involved in other occupations. Farm size data shows that nearly half (47.13%) have farms of less than 1

hectare, with only 0.57% owning more than 10 hectares. This demographic and socio-economic profile indicates a diverse yet predominantly small-scale farming community with modest income and landholding, reliant mainly on primary education and farming.

**Table 4.3** Characteristics of farmers who availed the loan

| Sample characteristics | Farmers who availed credit | | | | | | |
|---|---|---|---|---|---|---|---|
| | Below 50000 | 50000 - 1 lakh | 1 lakh - 2 lakh | 2 lakh - 3 lakh | Above 3 lakh | Total | |
| | | | | | | No. | % |
| **Total Farmers** | **454** | **318** | **88** | **10** | **2** | **872** | **100** |
| ***Gender*** | | | | | | | |
| **Male** | 299 | 235 | 54 | 3 | 2 | 593 | 68.00 |
| **Female** | 155 | 83 | 34 | 7 | 0 | 279 | 32.00 |
| ***Caste*** | | | | | | | |
| **ST** | 153 | 68 | 17 | 3 | 0 | 241 | 27.64 |
| **SC** | 64 | 45 | 4 | 0 | 0 | 113 | 12.96 |
| **Others** | 237 | 205 | 67 | 7 | 2 | 518 | 59.40 |
| ***Age*** | | | | | | | |
| **20-30** | 33 | 12 | 3 | 1 | 0 | 49 | 5.62 |
| **30-40** | 111 | 71 | 22 | 4 | 0 | 208 | 23.85 |
| **40-50** | 142 | 92 | 36 | 3 | 1 | 274 | 31.42 |
| **50-60** | 110 | 98 | 24 | 2 | 0 | 234 | 26.83 |
| **Above 60** | 58 | 45 | 3 | 0 | 1 | 107 | 12.27 |
| ***Education*** | | | | | | | |
| **Illiterate** | 54 | 24 | 4 | 0 | 0 | 82 | 9.40 |
| **Below primary** | 99 | 50 | 8 | 1 | 0 | 158 | 18.12 |
| **Primary** | 203 | 147 | 30 | 4 | 1 | 385 | 44.15 |
| **Matric** | 25 | 5 | 1 | 1 | 0 | 32 | 3.67 |
| **Secondary** | 50 | 57 | 31 | 1 | 1 | 140 | 16.06 |
| **Graduation & above** | 23 | 35 | 14 | 3 | 0 | 75 | 8.60 |
| ***Marital status*** | | | | | | | |
| **Married** | 441 | 317 | 87 | 9 | 2 | 856 | 98.17 |
| **Unmarried** | 13 | 1 | 1 | 1 | 0 | 16 | 1.83 |
| ***Annual Income*** | | | | | | | |
| **0 – 50000** | 144 | 64 | 14 | 1 | 0 | 223 | 25.57 |
| **50000 – 100000** | 172 | 95 | 22 | 4 | 1 | 294 | 33.72 |
| **100000 – 150000** | 80 | 58 | 8 | 1 | 0 | 147 | 16.86 |
| **150000 – 200000** | 24 | 24 | 12 | 1 | 0 | 61 | 7.00 |
| **200000 & above** | 34 | 77 | 32 | 3 | 1 | 147 | 16.86 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 370 | 251 | 69 | 9 | 1 | 700 | 80.28 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Joint** | 84 | 67 | 19 | 1 | 1 | 172 | 19.72 |
| ***Family size (Nos.)*** | | | | | | | |
| **1 to 5** | 326 | 225 | 66 | 8 | 1 | 626 | 71.79 |
| **5 to 10** | 123 | 86 | 19 | 1 | 1 | 230 | 26.38 |
| **10 to 15** | 3 | 7 | 3 | 0 | 0 | 13 | 1.49 |
| **15 and above** | 2 | 0 | 0 | 1 | 0 | 3 | 0.34 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 401 | 279 | 78 | 8 | 2 | 768 | 88.07 |
| **Other occupation** | 53 | 39 | 10 | 2 | 0 | 104 | 11.93 |
| ***Farm size*** | | | | | | | |
| **Less than 1 ha** | 283 | 108 | 17 | 3 | 0 | 411 | 47.13 |
| **1 ha – 2 ha** | 126 | 122 | 35 | 3 | 0 | 286 | 32.80 |
| **2 ha – 4 ha** | 37 | 68 | 31 | 2 | 1 | 139 | 15.94 |
| **4 ha – 10 ha** | 8 | 19 | 3 | 1 | 0 | 31 | 3.56 |
| **More than 10 ha** | 0 | 1 | 2 | 1 | 1 | 5 | 0.57 |

*Source:* Data collected through survey

## 4.2. Farmers in Mayurbhanj district

Agriculture is the main livelihood of people from the Mayurbhanj district and most of the production is Cereals, Oilseeds, Pulses, Vegetables, Spices and Fibre crops[1]. The sample of the study includes 105 farmers from the Mayurbhanj district. Around 90 per cent of the farmers in the district are marginal and around 87 per cent of the farmers have availed of credit. Compared to the overall sample, the number of farmers in the Mayurbhanj district is higher and women represent 85 per cent of the farmers. The age group that most farmers belong to in the Mayurbhanj district is between the age group of 30 to 50. While 50 per cent of the farmers in the district have primary education, 20 per cent have a secondary-level education, which is slightly better than the overall sample. The caste and marital status of farmers are in line with the overall sample; however, the annual income of most of the farmers in the district falls in the low-income group, i.e., below Rs. 50000. The distribution of farmers based on annual income is far below and clustered around the low-income level than that of the overall sample context. The family size and family system are similar to the overall sample. However, in Mayurbanj 25 per cent of farmers are engaged in other occupations along with agriculture, and still the people are coming under an annual income of Rs. 1,00,000, which is concerning. Overall, a larger representation of women farmers and a

larger set of low-income groups are the specific features of the Mayurbhanj district. Table 4.4 provides the details of the characteristics of the farmers in the Mayurbhanj district.

**Table 4.4** Farmer Characteristics of Mayurbhanj District

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **93** | **7** | **4** | **1** | | **105** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 82 | 7 | 2 | 1 | 0 | 92 | 87.62 |
| **Not availed** | 11 | 0 | 2 | 0 | 0 | 13 | 12.38 |
| ***Gender*** | | | | | | | |
| **Male** | 11 | 1 | 2 | 1 | 0 | 15 | 14.29 |
| **Female** | 82 | 6 | 2 | 0 | 0 | 90 | 85.71 |
| ***Age*** | | | | | | | |
| **20-30** | 12 | 3 | 1 | 0 | 0 | 16 | 15.24 |
| **30-40** | 31 | 2 | 2 | 0 | 0 | 35 | 33.33 |
| **40-50** | 26 | 0 | 1 | 1 | 0 | 28 | 26.67 |
| **50-60** | 17 | 0 | 0 | 0 | 0 | 17 | 16.19 |
| **60 & above** | 7 | 2 | 0 | 0 | 0 | 9 | 8.57 |
| ***Education*** | | | | | | | |
| **Illiterate** | 14 | 1 | 0 | 0 | 0 | 15 | 14.29 |
| **Below primary** | 4 | 1 | 0 | 0 | 0 | 5 | 4.76 |
| **Primary** | 49 | 2 | 2 | 0 | 0 | 53 | 50.48 |
| **Matric** | 8 | 0 | 1 | 0 | 0 | 9 | 8.57 |
| **Secondary** | 17 | 3 | 1 | 1 | 0 | 22 | 20.95 |
| **Graduation above** | 1 | 0 | 0 | 0 | 0 | 1 | 0.95 |
| ***Caste*** | | | | | | | |
| **ST** | 18 | 1 | 0 | 0 | 0 | 19 | 18.10 |
| **SC** | 15 | 0 | 0 | 0 | 0 | 15 | 14.29 |
| **Others** | 60 | 6 | 4 | 1 | 0 | 71 | 67.62 |
| ***Marital status*** | | | | | | | |
| **Married** | 88 | 7 | 4 | 1 | 0 | 100 | 95.24 |
| **Others** | 5 | 0 | 0 | 0 | 0 | 5 | 4.76 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 66 | 4 | 1 | 0 | 0 | 71 | 67.62 |
| **50000 - 100000** | 18 | 1 | 3 | 0 | 0 | 22 | 20.95 |
| **100000 - 150000** | 5 | 1 | 0 | 0 | 0 | 6 | 5.71 |
| **150000 - 200000** | 4 | 0 | 0 | 1 | 0 | 5 | 4.76 |
| **200000 & above** | 0 | 1 | 0 | 0 | 0 | 1 | 0.95 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 75 | 6 | 2 | 0 | 0 | 83 | 79.05 |
| **Joint** | 18 | 1 | 2 | 1 | 0 | 22 | 20.95 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 71 | 6 | 3 | 0 | 0 | 80 | 76.19 |
| **5 to 10** | 21 | 0 | 1 | 1 | 0 | 23 | 21.90 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **10 to 15** | 1 | 1 | 0 | 0 | 0 | 2 | 1.90 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 73 | 4 | 2 | 0 | 0 | 79 | 75.24 |
| **Other occupation** | 20 | 3 | 2 | 1 | 0 | 26 | 24.76 |

*Source:* Data collected through survey

### *4.3. Farmers in Keonjhar district*

In the Keonjhar district, the presence of both marginal and small farmers is higher and 95 per cent of farmers have taken agricultural credit. There is an equal presence of both women and men even though the presence of women is a little higher. Most farmers are more or less distributed in an age group between 30 and 60. Around 57 per cent of the farmers in the sample from Keonjhar district have only primary education only and are of a social class other than SC and ST. However, farmers of ST background are also higher in Keonjhar around 36 per cent, and most belong to the marginalised farmer category. As the overall sample, have the maximum number of farmers which are married and belong to the first three income groups, which are under Rs.1.5 lakhs. 80 per cent of the families of farmers belong to the nuclear family system, with 99 per cent coming with a family size fewer than 10 people, and 91 per cent of the farmers have only farming as their source of income. Overall, Keonjhar shares similar characteristics to the overall sample. Table 4.5 details the characteristics of the farmers in the Keonjhar district.

**Table 4.5** Farmer characteristics of Keonjhar District

| **Sample characteristics** | **Marginal** | **Small** | **Semi-medium** | **Medium** | **Large** | **Total** | |
|---|---|---|---|---|---|---|---|
| | | | | | | **No.** | **%** |
| **Total Farmers** | **83** | **39** | **7** | **1** | **0** | **130** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 77 | 39 | 7 | 1 | 0 | 124 | 95.38 |
| **Not availed** | 6 | 0 | 0 | 0 | 0 | 6 | 4.62 |
| ***Gender*** | | | | | | | |
| **Male** | 30 | 21 | 6 | 1 | 0 | 58 | 44.62 |
| **Female** | 53 | 18 | 1 | 0 | 0 | 72 | 55.38 |
| ***Age*** | | | | | | | |
| **20-30** | 9 | 2 | 0 | 1 | 0 | 12 | 9.23 |
| **30-40** | 31 | 14 | 2 | 0 | 0 | 47 | 36.15 |
| **40-50** | 24 | 8 | 2 | 0 | 0 | 34 | 26.15 |
| **50-60** | 16 | 13 | 3 | 0 | 0 | 32 | 24.62 |
| **60 & above** | 3 | 2 | 0 | 0 | 0 | 5 | 3.85 |
| ***Education*** | | | | | | | |
| **Illiterate** | 8 | 2 | 0 | 0 | 0 | 10 | 7.69 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Below primary** | 4 | 1 | 0 | 0 | 0 | 5 | 3.85 |
| **Primary** | 46 | 24 | 3 | 1 | 0 | 74 | 56.92 |
| **Matric** | 10 | 2 | 0 | 0 | 0 | 12 | 9.23 |
| **Secondary** | 10 | 9 | 4 | 0 | 0 | 23 | 17.69 |
| **Graduation above** | 5 | 1 | 0 | 0 | 0 | 6 | 4.62 |
| ***Caste*** | | | | | | | |
| **ST** | 31 | 10 | 3 | 1 | 0 | 45 | 34.62 |
| **SC** | 10 | 0 | 0 | 0 | 0 | 10 | 7.69 |
| **Others** | 42 | 29 | 4 | 0 | 0 | 75 | 57.69 |
| ***Marital status*** | | | | | | | |
| **Married** | 80 | 39 | 7 | 0 | 0 | 126 | 96.92 |
| **Others** | 3 | 0 | 0 | 1 | 0 | 4 | 3.08 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 19 | 6 | 0 | 1 | 0 | 26 | 20.00 |
| **50000 - 100000** | 36 | 10 | 3 | 0 | 0 | 49 | 37.69 |
| **100000 - 150000** | 19 | 16 | 2 | 0 | 0 | 37 | 28.46 |
| **150000 - 200000** | 7 | 3 | 0 | 0 | 0 | 10 | 7.69 |
| **200000 & above** | 2 | 4 | 2 | 0 | 0 | 8 | 6.15 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 68 | 32 | 4 | 1 | 0 | 105 | 80.77 |
| **Joint** | 15 | 7 | 3 | 0 | 0 | 25 | 19.23 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 63 | 28 | 4 | 1 | 0 | 96 | 73.85 |
| **5 to 10** | 19 | 11 | 3 | 0 | 0 | 33 | 25.38 |
| **10 to 15** | 1 | 0 | 0 | 0 | 0 | 1 | 0.77 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 74 | 38 | 7 | 0 | 0 | 119 | 91.54 |
| **Other occupation** | 9 | 1 | 0 | 1 | 0 | 11 | 8.46 |

*Source:* Data collected through survey

### *4.4. Farmers in Sambalpur district*

The Sambalpur district is predominantly represented by small farmers, followed by marginal and semi-medium farmers. All the sampled farmers in Sambalpur have accessed agricultural credit from various sources, and male farmers constitute the majority of these farmer groups. Approximately 40% of the farmers fall within the 40 to 50 age group, with many having only primary education. However, 28% of the farmers have attained higher secondary education, with a notable proportion of semi-medium farmers holding secondary-level education.

The characteristics such as caste, marital status, family size, and family system align with those of the overall sample. However, a higher number of individuals in Sambalpur are solely dependent on farming. Notably, around 20% of the farmers have an income exceeding Rs. 2 lakhs, which is above the average for the state of Odisha. The greater male representation in

the agricultural sector might explain the higher income levels among farmers in Sambalpur compared to districts like Mayurbhanj or Keonjhar, where female representation is higher and most people fall into lower income groups. Male farmers often have better access to resources such as land, credit, and inputs (seeds, fertilizers, machinery). They might have better access to markets and networks, enabling them to sell their produce at better prices or to more lucrative markets, which could improve their income levels. Table 4.6 provides detailed characteristics of the farmers in the Sambalpur district.

**Table 4.6** Farmer Characteristics of Sambalpur District

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **22** | **60** | **19** | **3** | **3** | **107** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 22 | 60 | 19 | 3 | 3 | 107 | 100 |
| **Not availed** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Gender*** | | | | | | | |
| **Male** | 13 | 33 | 16 | 3 | 2 | 67 | 62.62 |
| **Female** | 9 | 27 | 3 | 0 | 1 | 40 | 37.38 |
| ***Age*** | | | | | | | |
| **20-30** | 1 | 2 | 0 | 0 | 0 | 3 | 2.80 |
| **30-40** | 8 | 16 | 4 | 0 | 1 | 29 | 27.10 |
| **40-50** | 9 | 26 | 8 | 0 | 0 | 43 | 40.19 |
| **50-60** | 4 | 12 | 7 | 2 | 2 | 27 | 25.23 |
| **60 & above** | 0 | 4 | 0 | 1 | 0 | 5 | 4.67 |
| ***Education*** | | | | | | | |
| **Illiterate** | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| **Below primary** | 0 | 4 | 1 | 0 | 0 | 5 | 4.67 |
| **Primary** | 13 | 35 | 6 | 0 | 2 | 56 | 52.34 |
| **Matric** | 0 | 0 | 0 | 1 | 0 | 1 | 0.93 |
| **Secondary** | 8 | 12 | 10 | 1 | 0 | 31 | 28.97 |
| **Graduation above** | 1 | 9 | 2 | 1 | 1 | 14 | 13.08 |
| ***Caste*** | | | | | | | |
| **ST** | 10 | 17 | 2 | 0 | 1 | 30 | 28.04 |
| **SC** | 4 | 14 | 1 | 0 | 0 | 19 | 17.76 |
| **Others** | 8 | 29 | 16 | 3 | 2 | 58 | 54.21 |
| ***Marital status*** | | | | | | | |
| **Married** | 22 | 60 | 19 | 3 | 2 | 106 | 99.07 |
| **Others** | 0 | 0 | 0 | 0 | 1 | 1 | 0.93 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 6 | 10 | 1 | 0 | 0 | 17 | 15.89 |
| **50000 - 100000** | 15 | 33 | 3 | 1 | 0 | 52 | 48.60 |
| **100000 - 150000** | 1 | 9 | 2 | 0 | 0 | 12 | 11.21 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **150000 - 200000** | 0 | 3 | 2 | 0 | 0 | 5 | 4.67 |
| **200000 & above** | 0 | 5 | 11 | 2 | 3 | 21 | 19.63 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 20 | 53 | 16 | 3 | 2 | 94 | 87.85 |
| **Joint** | 2 | 7 | 3 | 0 | 1 | 13 | 12.15 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 17 | 48 | 14 | 2 | 2 | 83 | 77.57 |
| **5 to 10** | 5 | 10 | 5 | 1 | 0 | 21 | 19.63 |
| **10 to 15** | 0 | 2 | 0 | 0 | 0 | 2 | 1.87 |
| **15 and above** | 0 | 0 | 0 | 0 | 1 | 1 | 0.93 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 20 | 59 | 18 | 3 | 3 | 103 | 96.26 |
| **Other occupation** | 2 | 1 | 1 | 0 | 0 | 4 | 3.74 |

*Source:* Data collected through survey

### *4.5. Farmers in Balasore district*

The farmers in the Balasore district are more in the marginalised and small farmer groups and 99 per cent of the farmers have availed credit. Unlike other districts and the overall sample, most of the farmers are in the age group above 40 and farmers aged above 60 represent around 30 per cent of the sample. The education levels of the majority of farmers are primary only; however, Balasore has a higher percentage of farmers with a graduation level of education compared to the overall sample. Also, 99 per cent of the samples from Balasore are men only, and that could explain the higher education levels and better income distribution in the district. Balasore has a lesser percentage of farmers in social classes belonging to SC and ST, and around 95 per cent of the farmers belong to other classes. The farmers are also more or less distributed among the different income groups. Even though, the joint family presence in the family system of farmers is around 20 per cent, the family size is less than 10, but two households have more than 15 family members. Table 4.7 provides detailed characteristics of the farmers in the Balasore district.

**Table 4.7.** Farmer characteristics of Balasore District

| **Sample characteristics** | **Marginal** | **Small** | **Semi-medium** | **Medium** | **Large** | **Total** | |
|---|---|---|---|---|---|---|---|
| | | | | | | **No.** | **%** |
| **Total Farmers** | **58** | **42** | **5** | **0** | **0** | **105** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 57 | 42 | 5 | 0 | 0 | 104 | 99.05 |
| **Not availed** | 1 | 0 | 0 | 0 | 0 | 1 | 0.95 |
| ***Gender*** | | | | | | | |
| **Male** | 58 | 41 | 5 | 0 | 0 | 104 | 99.05 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Female** | 0 | 1 | 0 | 0 | 0 | 1 | 0.95 |
| ***Age*** | | | | | | | |
| **20-30** | 2 | 1 | 0 | 0 | 0 | 3 | 2.86 |
| **30-40** | 5 | 1 | 0 | 0 | 0 | 6 | 5.71 |
| **40-50** | 17 | 9 | 2 | 0 | 0 | 28 | 26.67 |
| **50-60** | 18 | 16 | 0 | 0 | 0 | 34 | 32.38 |
| **60 & above** | 16 | 15 | 3 | 0 | 0 | 34 | 32.38 |
| ***Education*** | | | | | | | |
| **Illiterate** | 1 | 0 | 0 | 0 | 0 | 1 | 0.95 |
| **Below primary** | 4 | 1 | 0 | 0 | 0 | 5 | 4.76 |
| **Primary** | 39 | 28 | 4 | 0 | 0 | 71 | 67.62 |
| **Matric** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Secondary** | 3 | 4 | 0 | 0 | 0 | 7 | 6.67 |
| **Graduation above** | 11 | 9 | 1 | 0 | 0 | 21 | 20.00 |
| ***Caste*** | | | | | | | |
| **ST** | 1 | 0 | 0 | 0 | 0 | 1 | 0.95 |
| **SC** | 3 | 2 | 0 | 0 | 0 | 5 | 4.76 |
| **Others** | 54 | 40 | 5 | 0 | 0 | 99 | 94.29 |
| ***Marital status*** | | | | | | | |
| **Married** | 56 | 41 | 5 | 0 | 0 | 102 | 97.14 |
| **Others** | 2 | 1 | 0 | 0 | 0 | 3 | 2.86 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 23 | 2 | 0 | 0 | 0 | 25 | 23.81 |
| **50000 - 100000** | 20 | 5 | 0 | 0 | 0 | 25 | 23.81 |
| **100000 - 150000** | 9 | 21 | 1 | 0 | 0 | 31 | 29.52 |
| **150000 - 200000** | 0 | 7 | 0 | 0 | 0 | 7 | 6.67 |
| **200000 & above** | 6 | 7 | 4 | 0 | 0 | 17 | 16.19 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 46 | 31 | 3 | 0 | 0 | 80 | 76.19 |
| **Joint** | 12 | 11 | 2 | 0 | 0 | 25 | 23.81 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 42 | 27 | 2 | 0 | 0 | 71 | 67.62 |
| **5 to 10** | 14 | 15 | 3 | 0 | 0 | 32 | 30.48 |
| **10 to 15** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **15 and above** | 2 | 0 | 0 | 0 | 0 | 2 | 1.90 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 53 | 36 | 5 | 0 | 0 | 94 | 89.52 |
| **Other occupation** | 5 | 6 | 0 | 0 | 0 | 11 | 10.48 |

*Source:* Data collected through survey

### *4.6. Farmers in Gajapati district*

The sample from the Gajapati district of Odisha comprise of 101 farmers, 99 per cent have availed agricultural credit through various means. The district's sample has a greater dominance of marginal farmers (50), followed by small (39) and semi-medium-level (10) farmers. Gajapati has a greater representation of ST farmers and 100 per cent of the farmers

are married. Most of the semi-medium farmers belong to other than SC and ST categories and have higher levels of income compared to other groups. In the district also, male farmers dominate the sample, and most of them are of the age group of 40 to 60. Most of the farmers are less educated as they fall under primary or below primary education level and 98 per cent of them are primarily focussed on agriculture as their main source of income. The highest numbers of farmers belong to the income group of Rs. 50000 to Rs. 1.5 lakhs, and around 65 per cent of the farmers belong to families with fewer than five members. Table 4.8 provides detailed characteristics of the farmers in the Gajapati district.

**Table 4.8.** Farmer characteristics of Gajapati District

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **50** | **39** | **10** | **2** | **0** | **101** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 49 | 39 | 10 | 2 | 0 | 100 | 99.01 |
| **Not availed** | 1 | 0 | 0 | 0 | 0 | 1 | 0.99 |
| ***Gender*** | | | | | | | |
| **Male** | 48 | 38 | 10 | 2 | 0 | 98 | 97.03 |
| **Female** | 2 | 1 | 0 | 0 | 0 | 3 | 2.97 |
| ***Age*** | | | | | | | |
| **20-30** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **30-40** | 6 | 4 | 1 | 1 | 0 | 12 | 11.88 |
| **40-50** | 17 | 13 | 5 | 1 | 0 | 36 | 35.64 |
| **50-60** | 21 | 14 | 3 | 0 | 0 | 38 | 37.62 |
| **60 & above** | 6 | 8 | 1 | 0 | 0 | 15 | 14.85 |
| ***Education*** | | | | | | | |
| **Illiterate** | 18 | 15 | 1 | 0 | 0 | 34 | 33.66 |
| **Below primary** | 14 | 11 | 1 | 0 | 0 | 26 | 25.74 |
| **Primary** | 13 | 11 | 4 | 1 | 0 | 29 | 28.71 |
| **Matric** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Secondary** | 1 | 2 | 1 | 0 | 0 | 4 | 3.96 |
| **Graduation above** | 4 | 0 | 3 | 1 | 0 | 8 | 7.92 |
| ***Caste*** | | | | | | | |
| **ST** | 35 | 14 | 1 | 0 | 0 | 50 | 49.50 |
| **SC** | 4 | 4 | 1 | 0 | 0 | 9 | 8.91 |
| **Others** | 11 | 21 | 8 | 2 | 0 | 42 | 41.58 |
| ***Marital status*** | | | | | | | |
| **Married** | 50 | 39 | 10 | 2 | 0 | 101 | 100 |
| **Others** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Annual Income*** | | | | | | | |
| **0 – 50000** | 12 | 0 | 0 | 0 | 0 | 12 | 11.88 |
| **50000 – 100000** | 29 | 9 | 0 | 0 | 0 | 38 | 37.62 |
| **100000 – 150000** | 8 | 18 | 0 | 0 | 0 | 26 | 25.74 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **150000 – 200000** | 0 | 8 | 3 | 0 | 0 | 11 | 10.89 |
| **200000 & above** | 1 | 4 | 7 | 2 | 0 | 14 | 13.86 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 42 | 37 | 9 | 2 | 0 | 90 | 89.11 |
| **Joint** | 8 | 2 | 1 | 0 | 0 | 11 | 10.89 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 31 | 26 | 6 | 2 | 0 | 65 | 64.36 |
| **5 to 10** | 19 | 13 | 4 | 0 | 0 | 36 | 35.64 |
| **10 to 15** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 50 | 38 | 9 | 2 | 0 | 99 | 98.02 |
| **Other occupation** | 0 | 1 | 1 | 0 | 0 | 2 | 1.98 |

*Source:* Data collected through survey

### *4.7. Farmers in Kalahandi district*

Kalahandi has a greater representation of semi-medium, small, and medium farmers respectively unlike the overall sample and other districts. The farmers from the district are around 95 per cent male, and they belong to an age group above 40 years. Even though, around 50 per cent of the farmers have primary-level education only, 40 per cent of farmers have secondary or graduation-level education or higher. The farmers in Kalahandi belong to the higher level of income group compared to other regions, as around 63 per cent of the farmers belong to an income group above Rs. 2 lakhs. This can be attributed to the higher presence of semi-medium and medium-level farmers. The greater number of farmers also belongs to the social class other than SC and ST. Around 14% of the farmers have income from other occupations. Overall, most of the farmers in the Kalahandi district have availed credit and are male with a better average annual income than the entire sample. A higher proportion of the farmers belongs to other than socially backward classes and is more semi-medium and medium-category farmers. Table 4.9 provides detailed characteristics of the farmers in the Kalahandi district.

**Table 4.9.** Farmer characteristics of Kalahandi District

| **Sample characteristics** | **Marginal** | **Small** | **Semi-medium** | **Medium** | **Large** | **Total** | |
|---|---|---|---|---|---|---|---|
| | | | | | | **No.** | **%** |
| **Total Farmers** | **16** | **23** | **42** | **20** | **1** | **102** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 15 | 22 | 40 | 20 | 1 | 98 | 96.08 |
| **Not availed** | 1 | 1 | 2 | 0 | 0 | 4 | 3.92 |
| ***Gender*** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Male** | 13 | 21 | 42 | 20 | 1 | 97 | 95.10 |
| **Female** | 3 | 2 | 0 | 0 | 0 | 5 | 4.90 |
| ***Age*** | | | | | | | |
| **20-30** | 0 | 2 | 2 | 1 | 0 | 5 | 4.90 |
| **30-40** | 2 | 1 | 4 | 3 | 0 | 10 | 9.80 |
| **40-50** | 6 | 8 | 12 | 8 | 0 | 34 | 33.33 |
| **50-60** | 7 | 7 | 14 | 3 | 0 | 31 | 30.39 |
| **60 & above** | 1 | 5 | 10 | 5 | 1 | 22 | 21.57 |
| ***Education*** | | | | | | | |
| **Illiterate** | 0 | 0 | 1 | 0 | 0 | 1 | 0.98 |
| **Below primary** | 1 | 0 | 3 | 1 | 0 | 5 | 4.90 |
| **Primary** | 12 | 15 | 16 | 11 | 1 | 55 | 53.92 |
| **Matric** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Secondary** | 1 | 6 | 11 | 2 | 0 | 20 | 19.61 |
| **Graduation above** | 2 | 2 | 11 | 6 | 0 | 21 | 20.59 |
| ***Caste*** | | | | | | | |
| **ST** | 2 | 9 | 5 | 4 | 0 | 20 | 19.61 |
| **SC** | 3 | 1 | 2 | 1 | 0 | 7 | 6.86 |
| **Others** | 11 | 13 | 35 | 15 | 1 | 75 | 73.53 |
| ***Marital status*** | | | | | | | |
| **Married** | 16 | 23 | 42 | 19 | 1 | 101 | 99.02 |
| **Others** | 0 | 0 | 0 | 1 | 0 | 1 | 0.98 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **50000 - 100000** | 5 | 6 | 0 | 1 | 0 | 12 | 11.76 |
| **100000 - 150000** | 4 | 6 | 0 | 1 | 0 | 11 | 10.78 |
| **150000 - 200000** | 4 | 4 | 7 | 0 | 0 | 15 | 14.71 |
| **200000 & above** | 3 | 7 | 35 | 18 | 1 | 64 | 62.75 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 13 | 17 | 36 | 14 | 1 | 81 | 79.41 |
| **Joint** | 3 | 6 | 6 | 6 | | 21 | 20.59 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 10 | 19 | 27 | 13 | 1 | 70 | 68.63 |
| **5 to 10** | 6 | 4 | 13 | 7 | 0 | 30 | 29.41 |
| **10 to 15** | 0 | 0 | 2 | 0 | 0 | 2 | 1.96 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 13 | 19 | 37 | 18 | 1 | 88 | 86.27 |
| **Other occupation** | 3 | 4 | 5 | 2 | 0 | 14 | 13.73 |

*Source:* Data collected through survey

### *4.8. Farmers in Nabrangpur district*

The sample from Nabrangpur includes 96 farmers, of which the highest number of farmers belongs to the small farmer category, and also has a greater presence of marginal as well as semi-medium farmer categories. Only 60 per cent of the farmers have accessed credit and the

rest 40 per cent have not accessed credit. The farmers are 95 per cent men who are spread above the age group of 30 years. The education of farmers in Nabrangpur is far below compared to other districts, as almost 75 per cent of the farmers are of less than primary level education. 80 per cent of the farmers in the district have an income less than Rs. 1 lakh, and 40 per cent of the farmers have joint families. Table 4.10 provides detailed characteristics of the farmers in the Nabrangpur district.

**Table 4.10.** Farmer characteristics of Nabrangpur District

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **27** | **43** | **25** | **1** | **0** | **96** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 14 | 24 | 19 | 1 | 0 | 58 | 60.42 |
| **Not availed** | 13 | 19 | 6 | 0 | 0 | 38 | 39.58 |
| ***Gender*** | | | | | | | |
| **Male** | 26 | 42 | 25 | 1 | 0 | 94 | 97.92 |
| **Female** | 1 | 1 | 0 | 0 | 0 | 2 | 2.08 |
| ***Age*** | | | | | | | |
| **20-30** | 2 | 3 | 1 | 0 | 0 | 6 | 6.25 |
| **30-40** | 6 | 9 | 2 | 1 | 0 | 18 | 18.75 |
| **40-50** | 6 | 10 | 7 | 0 | 0 | 23 | 23.96 |
| **50-60** | 10 | 18 | 7 | 0 | 0 | 35 | 36.46 |
| **60 & above** | 3 | 3 | 8 | 0 | 0 | 14 | 14.58 |
| ***Education*** | | | | | | | |
| **Illiterate** | 4 | 7 | 5 | 0 | 0 | 16 | 16.67 |
| **Below primary** | 19 | 26 | 12 | 0 | 0 | 57 | 59.38 |
| **Primary** | 1 | 3 | 3 | 1 | 0 | 8 | 8.33 |
| **Matric** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Secondary** | 3 | 5 | 4 | 0 | 0 | 12 | 12.50 |
| **Graduation above** | 0 | 2 | 1 | 0 | 0 | 3 | 3.13 |
| ***Caste*** | | | | | | | |
| **ST** | 10 | 11 | 6 | 1 | 0 | 28 | 29.17 |
| **SC** | 1 | 8 | 5 | 0 | 0 | 14 | 14.58 |
| **Others** | 16 | 24 | 14 | 0 | 0 | 54 | 56.25 |
| ***Marital status*** | | | | | | | |
| **Married** | 26 | 42 | 25 | 1 | 0 | 94 | 97.92 |
| **Others** | 1 | 1 | 0 | 0 | 0 | 2 | 2.08 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 10 | 9 | 2 | 0 | 0 | 21 | 21.88 |
| **50000 - 100000** | 16 | 28 | 14 | 1 | 0 | 59 | 61.46 |
| **100000 - 150000** | 1 | 6 | 4 | 0 | 0 | 11 | 11.46 |
| **150000 - 200000** | 0 | 0 | 1 | 0 | 0 | 1 | 1.04 |
| **200000 & above** | 0 | 0 | 4 | 0 | 0 | 4 | 4.17 |
| ***Family system*** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Nuclear** | 18 | 25 | 14 | 0 | 0 | 57 | 59.38 |
| **Joint** | 9 | 18 | 11 | 1 | 0 | 39 | 40.63 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 20 | 24 | 14 | 0 | 0 | 58 | 60.42 |
| **5 to 10** | 7 | 16 | 11 | 1 | 0 | 35 | 36.46 |
| **10 to 15** | 0 | 3 | 0 | 0 | 0 | 3 | 3.13 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 26 | 40 | 25 | 1 | 0 | 92 | 95.83 |
| **Other occupation** | 1 | 3 | 0 | 0 | 0 | 4 | 4.17 |

*Source:* Data collected through survey

### *4.9. Farmers in Malkangiri district*

From the sample of 110 farmers from the Malkangiri district, 66 of them are marginal farmers and around 17 per cent of the farmers have not availed credit. The male-female distribution among the sample farmers from the district is quite similar, as around half of the sample is male and the other half of the sample is female. However, a major disparity can be seen as among the 57 female farmers, 52 of them are marginal farmers only, while the male farmers are distributed across marginal, small, and semi-medium farmer categories. The higher presence of marginal farmers is contributed by the female farmers' presence in the case of this district. The farmers mostly belong to the 30 to 50 age group, and a higher number of farmers have education of primary or below primary level only. The presence of SC farmers is comparatively higher in the district compared to other districts and the farmers are distributed among the SC, ST, and other categories. The income distribution is also an issue as most of the farmers fall into the less than Rs. 50000 or between Rs. 50000 – Rs. 1 lakh groups. Table 4.11 provides detailed characteristics of the farmers in the Malkangiri district.

**Table 4.11.** Farmer characteristics of Malkangiri District

| **Sample characteristics** | **Marginal** | **Small** | **Semi-medium** | **Medium** | **Large** | **Total** | |
|---|---|---|---|---|---|---|---|
| | | | | | | **No.** | **%** |
| **Total Farmers** | **66** | **26** | **17** | **1** | **0** | **110** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 57 | 20 | 13 | 1 | 0 | 91 | 82.73 |
| **Not availed** | 9 | 6 | 4 | 0 | 0 | 19 | 17.27 |
| ***Gender*** | | | | | | | |
| **Male** | 14 | 22 | 16 | 1 | 0 | 53 | 48.18 |
| **Female** | 52 | 4 | 1 | 0 | 0 | 57 | 51.82 |
| ***Age*** | | | | | | | |
| **20-30** | 6 | 1 | 1 | 0 | 0 | 8 | 7.27 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **30-40** | 24 | 16 | 6 | 0 | 0 | 46 | 41.82 |
| **40-50** | 19 | 7 | 9 | 1 | 0 | 36 | 32.73 |
| **50-60** | 12 | 2 | 1 | 0 | 0 | 15 | 13.64 |
| **60 & above** | 5 | 0 | 0 | 0 | 0 | 5 | 4.55 |
| ***Education*** | | | | | | | |
| **Illiterate** | 7 | 0 | 0 | 0 | 0 | 7 | 6.36 |
| **Below primary** | 6 | 23 | 17 | 0 | 0 | 46 | 41.82 |
| **Primary** | 37 | 0 | 0 | 0 | 0 | 37 | 33.64 |
| **Matric** | 4 | 0 | 0 | 0 | 0 | 4 | 3.64 |
| **Secondary** | 12 | 3 | 0 | 1 | 0 | 16 | 14.55 |
| **Graduation above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Caste*** | | | | | | | |
| **ST** | 11 | 12 | 4 | 0 | 0 | 27 | 24.55 |
| **SC** | 17 | 9 | 12 | 0 | 0 | 38 | 34.55 |
| **Others** | 38 | 5 | 1 | 1 | 0 | 45 | 40.91 |
| ***Marital status*** | | | | | | | |
| **Married** | 62 | 26 | 17 | 1 | 0 | 106 | 96.36 |
| **Others** | 4 | 0 | 0 | 0 | 0 | 4 | 3.64 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 45 | 8 | 1 | 0 | 0 | 54 | 49.09 |
| **50000 - 100000** | 14 | 18 | 16 | 0 | 0 | 48 | 43.64 |
| **100000 - 150000** | 3 | 0 | 0 | 0 | 0 | 3 | 2.73 |
| **150000 - 200000** | 4 | 0 | 0 | 1 | 0 | 5 | 4.55 |
| **200000 & above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 55 | 21 | 13 | 0 | 0 | 89 | 80.91 |
| **Joint** | 11 | 5 | 4 | 1 | | 21 | 19.09 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 54 | 21 | 12 | 0 | 0 | 87 | 79.09 |
| **5 to 10** | 12 | 4 | 5 | 1 | | 22 | 20.00 |
| **10 to 15** | 0 | 1 | 0 | 0 | 0 | 1 | 0.91 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 54 | 26 | 17 | 0 | 0 | 97 | 88.18 |
| **Other occupation** | 12 | 0 | 0 | 1 | 0 | 13 | 11.82 |

*Source:* Data collected through survey

### *4.10. Farmers in Koraput district*

The farmers in the Koraput are spread across the three farmer-level categories; marginal, small and semi-medium. Around 42 per cent of the farmers have not availed credit and the higher proportions of farmers who have not availed credit belong to the marginal level. The majority of the farmers are male and the farmers included in the semi-medium level are also them. The level of education is poor as almost 73 per cent of the farmers are of below primary education and they spread across the age group of 30 to 60 years. The social classes

the majority of the farmers belong to are other than the ST and SC categories; however, the presence of farmers belonging to the ST categories is also evident. The farmers' income levels are spread across the first three income groups, which is below Rs. 1.5 lakhs and 17 per cent of sample farmers having income above Rs. 2 lakhs are coming under semi-medium or higher categories. Table 4.12 provides detailed characteristics of the farmers in the Koraput district.

**Table 4.12.** Farmer characteristics of Koraput District

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **36** | **38** | **26** | **2** | **1** | **103** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 15 | 22 | 20 | 2 | 1 | 60 | 58.25 |
| **Not availed** | 21 | 16 | 6 | 0 | 0 | 43 | 41.75 |
| ***Gender*** | | | | | | | |
| **Male** | 23 | 25 | 25 | 2 | 1 | 76 | 73.79 |
| **Female** | 13 | 13 | 1 | 0 | 0 | 27 | 26.21 |
| ***Age*** | | | | | | | |
| **20-30** | 2 | 3 | 2 | 0 | 0 | 7 | 6.80 |
| **30-40** | 11 | 10 | 5 | 1 | 1 | 28 | 27.18 |
| **40-50** | 7 | 13 | 10 | 0 | 0 | 30 | 29.13 |
| **50-60** | 10 | 9 | 8 | 1 | 0 | 28 | 27.18 |
| **60 & above** | 6 | 3 | 1 | 0 | 0 | 10 | 9.71 |
| ***Education*** | | | | | | | |
| **Illiterate** | 10 | 4 | 0 | 0 | 0 | 14 | 13.59 |
| **Below primary** | 23 | 25 | 11 | 2 | 1 | 62 | 60.19 |
| **Primary** | 0 | 7 | 2 | 0 | 0 | 9 | 8.74 |
| **Matric** | 1 | 0 | 0 | 0 | 0 | 1 | 0.97 |
| **Secondary** | 2 | 0 | 11 | 0 | 0 | 13 | 12.62 |
| **Graduation above** | 0 | 2 | 2 | 0 | 0 | 4 | 3.88 |
| ***Caste*** | | | | | | | |
| **ST** | 15 | 14 | 7 | 0 | 1 | 37 | 35.92 |
| **SC** | 2 | 9 | 5 | 2 | 0 | 18 | 17.48 |
| **Others** | 19 | 15 | 14 | 0 | 0 | 48 | 46.60 |
| ***Marital status*** | | | | | | | |
| **Married** | 36 | 37 | 26 | 2 | 1 | 102 | 99.03 |
| **Others** | 0 | 1 | 0 | 0 | 0 | 1 | 0.97 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 16 | 8 | 3 | 0 | 0 | 27 | 26.21 |
| **50000 - 100000** | 12 | 15 | 2 | 0 | 0 | 29 | 28.16 |
| **100000 - 150000** | 6 | 12 | 6 | 0 | 0 | 24 | 23.30 |
| **150000 - 200000** | 1 | 3 | 2 | 0 | 0 | 6 | 5.83 |
| **200000 & above** | 1 | 0 | 13 | 2 | 1 | 17 | 16.50 |
| ***Family system*** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Nuclear** | 33 | 32 | 21 | 1 | 0 | 87 | 84.47 |
| **Joint** | 3 | 6 | 5 | 1 | 1 | 16 | 15.53 |
| ***Family size*** | | | | | | | |
| **1 to 5** | 31 | 29 | 19 | 2 | 0 | 81 | 78.64 |
| **5 to 10** | 5 | 8 | 6 | 0 | 0 | 19 | 18.45 |
| **10 to 15** | 0 | 1 | 1 | 0 | 1 | 3 | 2.91 |
| **15 and above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 33 | 37 | 26 | 2 | 1 | 99 | 96.12 |
| **Other occupation** | 3 | 1 | 0 | 0 | 0 | 4 | 3.88 |

*Source:* Data collected through survey

### *4.11. Farmers in Sundergarh District*

The number of farmers from Sundergarh district in the sample is around 77, of which most of the farmers are marginal level farmers and the higher number of farmers who have not availed credit belongs to Sundergarh district. Half of the sampled farmers from the district have not availed credit and the presence of both female and male is more or less equal. The farmers are fairly spread across different age groups, and the education levels are less than primary mostly. The presence of the ST population is higher in the district which is around 66 per cent and around 65 per cent of the farmers are earning an annual income below Rs.1 lakh. Around 27 per cent of the sample population have earnings from jobs other than agriculture. Other than characteristics like family size, family system, marital status, etc. are in line with the overall sample. Table 4.13 provides detailed characteristics of the farmers in the Sundergarh district.

**Table 4.13. Farmer characteristics of Sundergarh District**

| Sample characteristics | Marginal | Small | Semi-medium | Medium | Large | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. | % |
| **Total Farmers** | **47** | **22** | **7** | **1** | **0** | **77** | **100** |
| ***Loan availed*** | | | | | | | |
| **Availed** | 23 | 11 | 4 | 0 | 0 | 38 | 49.35 |
| **Not availed** | 24 | 11 | 3 | 1 | 0 | 39 | 50.65 |
| ***Gender*** | | | | | | | |
| **Male** | 25 | 15 | 4 | 1 | 0 | 45 | 58.44 |
| **Female** | 22 | 7 | 3 | 0 | 0 | 32 | 41.56 |
| ***Age (Years)*** | | | | | | | |
| **20-30** | 3 | 6 | 1 | 0 | 0 | 10 | 12.99 |
| **30-40** | 16 | 2 | 1 | 0 | 0 | 19 | 24.68 |
| **40-50** | 14 | 7 | 2 | 0 | 0 | 23 | 29.87 |
| **50-60** | 7 | 5 | 2 | 0 | 0 | 14 | 18.18 |
| **60 & above** | 7 | 2 | 1 | 1 | 0 | 11 | 14.29 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Education*** | | | | | | | |
| **Illiterate** | 14 | 2 | 1 | 0 | 0 | 17 | 22.08 |
| **Below primary** | 13 | 8 | 3 | 0 | 0 | 24 | 31.17 |
| **Primary** | 15 | 3 | 1 | 1 | 0 | 20 | 25.97 |
| **Matric** | 3 | 6 | 1 | 0 | 0 | 10 | 12.99 |
| **Secondary** | 2 | 3 | 1 | 0 | 0 | 6 | 7.79 |
| **Graduation & above** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Caste*** | | | | | | | |
| **ST** | 30 | 16 | 5 | 0 | 0 | 51 | 66.23 |
| **SC** | 3 | 1 | 0 | 0 | 0 | 4 | 5.19 |
| **Others** | 14 | 5 | 2 | 1 | 0 | 22 | 28.57 |
| ***Marital status*** | | | | | | | |
| **Married** | 43 | 22 | 6 | 1 | 0 | 72 | 93.51 |
| **Others** | 4 | 0 | 1 | 0 | 0 | 5 | 6.49 |
| ***Annual Income*** | | | | | | | |
| **0 - 50000** | 18 | 5 | 2 | 0 | 0 | 25 | 32.47 |
| **50000 - 100000** | 18 | 5 | 3 | 0 | 0 | 26 | 33.77 |
| **100000 - 150000** | 7 | 5 | 1 | 0 | 0 | 13 | 16.88 |
| **150000 - 200000** | 1 | 2 | 0 | 1 | 0 | 4 | 5.19 |
| **200000 & above** | 3 | 5 | 1 | 0 | 0 | 9 | 11.69 |
| ***Family system*** | | | | | | | |
| **Nuclear** | 40 | 15 | 5 | 1 | 0 | 61 | 79.22 |
| **Joint** | 7 | 7 | 2 | 0 | 0 | 16 | 20.78 |
| ***Family size (Nos.)*** | | | | | | | |
| **1 to 5** | 33 | 13 | 4 | 0 | 0 | 50 | 64.94 |
| **5 to 10** | 13 | 7 | 3 | 1 | 0 | 24 | 31.17 |
| **10 to 15** | 1 | 1 | 0 | 0 | 0 | 2 | 2.60 |
| **15 and above** | 0 | 1 | 0 | 0 | 0 | 1 | 1.30 |
| ***Occupation*** | | | | | | | |
| **Only farming** | 33 | 18 | 4 | 1 | 0 | 56 | 72.73 |
| **Other occupation** | 14 | 4 | 3 | 0 | 0 | 21 | 27.27 |

*Source:* Data collected through survey

### *4.12. Test for differences – district level*

The ANOVA results in Tables 4.14 to 4.18 examine district-level differences in various socio-economic indicators, specifically income, operated area, land owned, equipment used, and livestock ownership. These analyses aim to determine if there are statistically significant variations in these variables across districts.

Table 4.14. Test for district-level differences in Income

| | Partial SS | df | MS | F | Prob > F |
|---|---|---|---|---|---|
| **Model** | 241.6335 | 9 | 26.8482 | 47.45 | 0.0000 |
| **District** | 241.6335 | 9 | 26.8482 | 47.45 | 0.0000 |

| | | | |
|---|---|---|---|
| **Residual** | 580.5645 | 1026 | .5659 |
| **Total** | 822.1979 | 1035 | .7944 |

The ANOVA results in Table 4.14 indicate a statistically significant difference in income levels across districts. With an F-statistic of 47.45 and a P-value of 0.0000, we reject the null hypothesis, suggesting that income levels vary meaningfully between districts. The Model Sum of Squares (SS) is 241.63, compared to a Residual SS of 580.56, which means that a portion of the variability in income can be attributed to district-level differences. This result implies that districts have distinctive income levels, possibly influenced by district-specific economic, social, or environmental factors.

Table 4.15. Test for district-level difference in Operated area

| | **Partial SS** | **df** | **MS** | **F** | **Prob > F** |
|---|---|---|---|---|---|
| **Model** | 410.2738 | 9 | 45.5859 | 20.45 | 0.0000 |
| **District** | 410.2738 | 9 | 45.5859 | 20.45 | 0.0000 |
| **Residual** | 2287.1608 | 1026 | 2.2292 | | |
| **Total** | 2697.4347 | 1035 | 2.6062 | | |

Table 4.15 shows significant variation in the operated area across districts, as evidenced by an F-statistic of 20.45 and a P-value of 0.0000. The Model SS is 410.27, which, although lower than the Residual SS of 2287.16, still indicates that district factors play a meaningful role in explaining the variability in the operated area. This suggests that the amount of land individuals operate on is influenced by the district they belong to, which could be due to differences in land availability, land tenure systems, or local agricultural practices.

Table 4.16. Test for district-level difference in Land owned

| | **Partial SS** | **df** | **MS** | **F** | **Prob > F** |
|---|---|---|---|---|---|
| **Model** | 268.8268 | 9 | 29.8696 | 11.13 | 0.0000 |
| **District** | 268.8268 | 9 | 29.8696 | 11.13 | 0.0000 |
| **Residual** | 2753.1109 | 1026 | 2.6833 | | |
| **Total** | 3021.9377 | 1035 | 2.9197 | | |

In Table 4.16, the F-statistic of 11.13 and a P-value of 0.0000 indicate significant differences in land ownership across districts. While the Residual SS is relatively high at 2753.11, the Model SS of 268.83 confirms that district differences have an impact on the amount of land owned.

Table 4.17. Test for district-level differences in Equipment used

| | **Partial SS** | **df** | **MS** | **F** | **Prob > F** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Model** | 3741.7588 | 9 | 415.7509 | 20.77 | 0.0000 |
| **District** | 3741.7588 | 9 | 415.7509 | 20.77 | 0.0000 |
| **Residual** | 20539.3098 | 1026 | 20.0188 | | |
| **Total** | 24281.0686 | 1035 | 23.4599 | | |

The ANOVA results in Table 4.17 reveal significant variation in equipment usage across districts, as indicated by an F-statistic of 20.77 and a P-value of 0.0000. The Model SS is 3741.76, while the Residual SS is notably higher at 20539.31, suggesting that although district differences contribute to variation in equipment use, other factors also play a significant role. This result implies that the use of equipment in farming or other activities varies by district, potentially influenced by differences in infrastructure, access to credit or technology, and local agricultural practices.

Table 4.18. Test for district-level difference in Livestock

| | **Partial SS** | **df** | **MS** | **F** | **Prob > F** |
|---|---|---|---|---|---|
| **Model** | 5218.9649 | 9 | 579.8849 | 24.11 | 0.0000 |
| **District** | 5218.9649 | 9 | 579.8849 | 24.11 | 0.0000 |
| **Residual** | 24679.188 | 1026 | 24.0538 | | |
| **Total** | 29898.1529 | 1035 | 28.8871 | | |

Finally, Table 4.18 demonstrates significant differences in livestock ownership across districts, with an F-statistic of 24.11 and a P-value of 0.0000. The Model SS of 5218.96, compared to a Residual SS of 24679.19, indicates that district-level factors contribute to the variation in livestock ownership, though they are not the sole determinants. This may reflect differences in livestock rearing practices, availability of grazing land, or cultural preferences for livestock types across districts. These findings highlight the importance of considering regional or district-level characteristics when analysing socio-economic outcomes, as local conditions and policies likely contribute to these observed differences.

Table 4.19. Test for district-level difference in Loan Amount

| **Loan Amount** | **District (10)** | **Total** | **Test results** |
|---|---|---|---|
| **1** | 26 | 454 | Chi-2 test value – 229.9081<br>P-value – 0.00 |
| **2** | 16 | 318 | |
| **3** | 18 | 88 | |
| **4** | 0 | 10 | |
| **5** | 0 | 2 | |
| **Total** | 60 | 872 | |

Further since, the loan amount was a categorical variable, a chi-square test was used to see whether there existed any significant differences in the loan amount across different districts.

The chi-square test results reveal a significant association between district and loan amount, indicating that loan amounts vary substantially across different districts. The observed chi-square statistic is 229.9081 with a p-value of 0.000, which is well below the typical significance threshold of 0.05. This low p-value suggests that the differences in loan amounts across districts are unlikely to be due to random chance, pointing instead to systematic disparities. For instance, District 1 has a high frequency of individuals with a loan amount of 10, totalling 26 cases out of 454, while other districts, such as Districts 4 and 5, have no cases in this loan category. These findings imply that factors specific to each district might be influencing loan amounts, reflecting a statistically significant variation in loan distributions across the regions studied. Table 4.19 depicts the chi-square test results for the district level differences in loan amount.

### *4.13. Test for Gender disparities in loan access and income*

Table 4.20 . Test for gender disparities in Loan Amount

| Gender | Loan amount | | | | | Total | Test Results |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| **Female** | 155 | 83 | 34 | 7 | 0 | 279 | Pearson chi2(4) = 15.4018 |
| **Male** | 299 | 235 | 54 | 3 | 2 | 593 | Pr = 0.004 |
| **Total** | 454 | 318 | 88 | 10 | 2 | 872 | |

Table 4.21. Test for gender disparities in income

| Gender | Annual income | | | | | Total | Test Results |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| **Female** | 148 | 104 | 49 | 17 | 11 | 329 | Pearson chi2(4) = 106.7006 |
| **Male** | 130 | 256 | 125 | 52 | 144 | 707 | Pr = 0.000 |
| **Total** | 278 | 360 | 174 | 69 | 155 | 1036 | |

Table 4.20 and 4.21 depicts the chi-square test results testing for gender disparities in loan access and income levels respectively. The Chi-square tests indicate statistically significant associations between gender and both loan amount and annual income categories. For the loan amount, the test result (chi^2= 15.4018, p = 0.004) suggests that loan amounts vary significantly with gender. Specifically, females (coded as 0) are generally underrepresented in higher loan categories compared to males (coded as 1), indicating that men in this dataset tend to take larger loans more frequently than women.

Similarly, the test for annual income (chi^2=106.7006, p = 0.000) reveals a strong association between gender and income categories. Females are more concentrated in lower income categories, while males are more evenly distributed across higher income brackets, particularly in the highest income category. This pattern implies that men in this sample are more likely to have higher incomes than women. Together, these findings suggest that gender may play a role in shaping both loan amount distribution and income levels within this dataset.

### *4.14. Financial inclusion efforts in Odisha*

The State of Odisha, with its rich heritage and numerous demographic and geographical advantages, has made significant progress in literacy, poverty reduction, natural resource management, and policy reforms. As per the report by SIDBI (2017) 'Status of Financial Inclusion & Way Forward - Odisha 2012-17', Odisha lags behind national averages on key indicators, including per capita income and poverty ratio. Odisha has a significant ST and SC population. The state faces challenges such as regional, social, and gender disparities, with 19 districts affected by left-wing extremism, including the KBK region. The state also deals with regional imbalances, poor rural infrastructure, low productivity, and dependence on agriculture, compounded by recurrent natural calamities. Major challenges include providing financial services to remote areas, improving per capita income, and promoting livelihoods for low-income populations.

Table 4.22 depicts the financial inclusion metrics for Odisha as on 31st March 2023. Credit-deposit ratio indicates the proportion of deposited funds that are lent out as credit. A higher ratio signifies more credit being provided relative to deposits. The banking infrastructure data

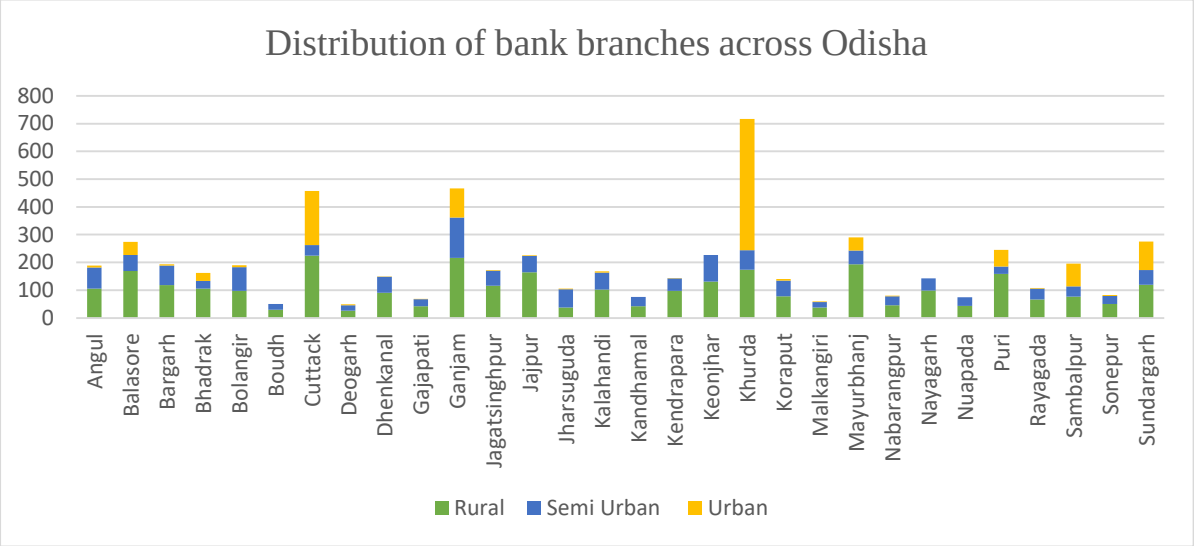
for Odisha reveals significant disparities across its districts. The state's overall Credit-Deposit (CD) ratio is 76.52%, indicating that a large portion of deposits is being utilized for credit. However, districts like Jharsuguda have an exceptionally high CD ratio of 246.77%, suggesting a strong lending activity relative to deposits, while Mayurbhanj has a low CD ratio of 48.87%, indicating underutilization of deposited funds. The number of bank branches, business correspondents, and ATMs also varies widely, with Khurda having the highest number of bank branches (717) and ATMs (1,293), reflecting a well-developed banking infrastructure. Khurda has highest urban population and the highest number of bank branches can be attributed to the higher representation of urban area. Figure 4.3 depicts the number of bank branches in each district area wise. In contrast, Boudh, with only 50 bank branches and 47 ATMs, shows limited banking accessibility. Figure 4.4 depicts the number of ATMS across Odisha. The efforts to increase the presence of business correspondents in regions like Balasore and Ganjam, which have 2,880 and 3,895 correspondents respectively, indicate a focus on extending banking services to remote areas. Figure 4.5 shows the number of bank correspondents over the regions. Overall, while Odisha shows a reasonably high state-wide CD ratio, the uneven distribution of banking services underscores the necessity for targeted interventions to improve financial access in less-served districts.

Table 4.22 Financial inclusion metrics in Odisha as on 31st March 2023

| BANKS | Credit-Deposit Ratio | Bank Branches | Business Correspondents | ATMs |
|---|---|---|---|---|
| ***Angul*** | 63.57 | 188 | 1118 | 292 |
| ***Balasore*** | 63.96 | 274 | 2880 | 365 |
| ***Bargarh*** | 87.75 | 193 | 1959 | 199 |
| ***Bhadrak*** | 74.73 | 162 | 1888 | 260 |
| ***Bolangir*** | 75.54 | 190 | 2731 | 211 |
| ***Boudh*** | 86.81 | 50 | 519 | 47 |
| ***Cuttack*** | 59.34 | 457 | 3349 | 614 |
| ***Deogarh*** | 51.9 | 49 | 296 | 44 |
| ***Dhenkanal*** | 66.44 | 149 | 1431 | 161 |
| ***Gajapati*** | 49.99 | 69 | 387 | 71 |
| ***Ganjam*** | 63.95 | 467 | 3895 | 622 |
| ***Jagatsinghpur*** | 57.52 | 173 | 2239 | 233 |
| ***Jajpur*** | 90.77 | 226 | 2208 | 320 |
| ***Jharsuguda*** | 246.77 | 105 | 572 | 144 |
| ***Kalahandi*** | 106.34 | 168 | 2255 | 166 |
| ***Kandhamal*** | 55.57 | 76 | 763 | 88 |
| ***Kendrapara*** | 56.38 | 144 | 1025 | 193 |
| ***Keonjhar*** | 55.86 | 227 | 1522 | 284 |
| ***Khurda*** | 75.42 | 717 | 3189 | 1293 |

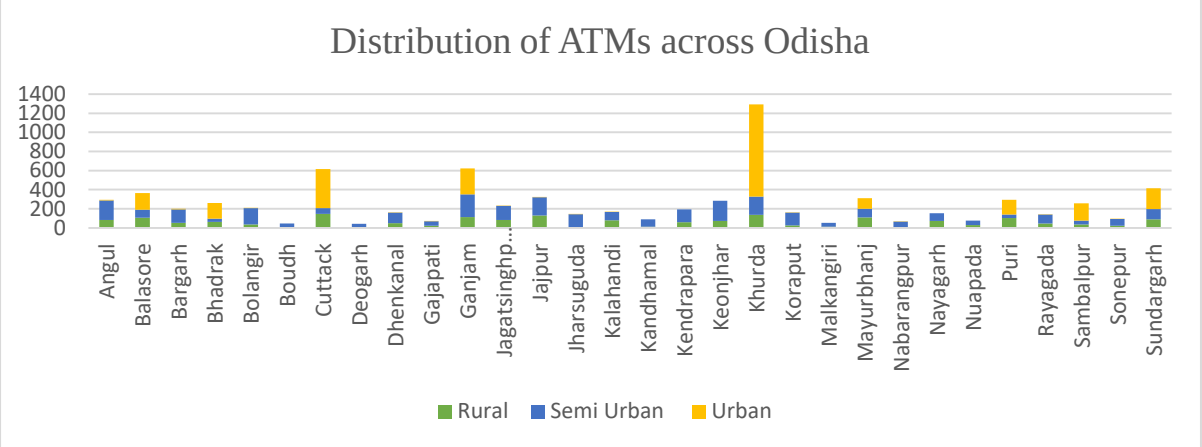
| | | | | |
|---|---|---|---|---|
| ***Koraput*** | 64.91 | 140 | 1306 | 164 |
| ***Malkangiri*** | 57.96 | 59 | 658 | 51 |
| ***Mayurbhanj*** | 48.87 | 290 | 2619 | 309 |
| ***Nabarangpur*** | 77.17 | 80 | 1295 | 68 |
| ***Nayagarh*** | 78.3 | 142 | 1329 | 153 |
| ***Nuapada*** | 66.72 | 74 | 904 | 76 |
| ***Puri*** | 53.22 | 245 | 2198 | 292 |
| ***Rayagada*** | 108.87 | 108 | 878 | 141 |
| ***Sambalpur*** | 106.06 | 195 | 1060 | 258 |
| ***Sonepur*** | 80.67 | 82 | 1034 | 93 |
| ***Sundargarh*** | 55.3 | 275 | 1416 | 415 |
| **Total** | **76.52** | **5774** | **48923** | **7627** |

*Source:* SLBC Odisha



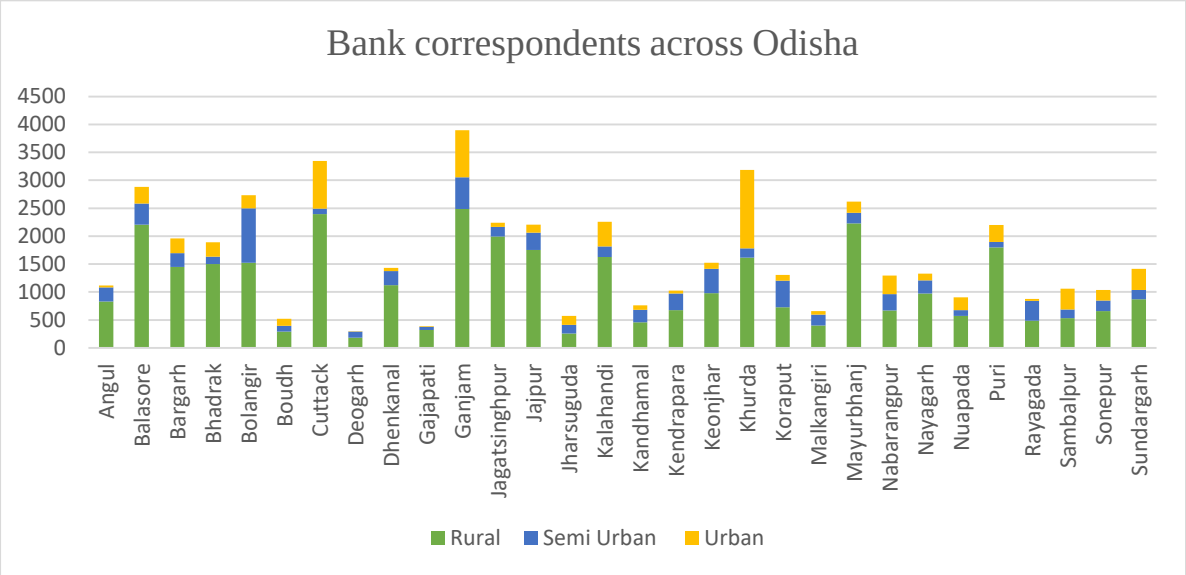

*Source:* SLBC Odisha

**Figure 4.3** Bank branches in Odisha



*Source:* SLBC Odisha

**Figure 4.4** No. of ATMs in Odisha




*Source:* SLBC Odisha

**Figure 4.5** Bank correspondents in Odisha

# Chapter 5 – Agricultural Credit: Determinants and Constraints

This chapter explores the factors influencing credit access to and utilisation of agricultural credit, as well as the primary obstacles farmers face in securing financing. It examines the determinants of credit demand among the sampled households, including socio-economic factors such as income, farm size, education, and family structure, which can shape farmers' borrowing capacity and preferences. In addition to identifying key determinants, this chapter discusses major constraints that hinder farmers from obtaining adequate and timely credit. These may include procedural complexities, collateral requirements, and limited awareness of available credit schemes. The chapter also delves into institutional factors like interest rates, loan terms, and lender policies, which may impact farmers' access to credit.

**KEY FINDINGS**

- **Determinants of Credit Access**:
  - **Education and Engagement**: Primary and secondary level education, along with participation in Krishi Mela, positively influences farmers' decision to take agricultural credit.
  - **KCC Benefits**: The Kisan Credit Card (KCC) scheme not only facilitates the decision to take credit but also enhances the borrowing capacity, leading to higher credit amounts.
  - **Distance and Perception**: Greater distances to financial institutions and farmers' perceptions of high interest rates negatively impact their decisions to take loans.
  - **Socioeconomic Factors**: Farmers from Scheduled Tribe (ST) backgrounds may experience reduced borrowing amounts due to socio-economic challenges.
  - **Gender Dynamics**: Male farmers are less likely to borrow higher amounts compared to female farmers, suggesting gender differences in credit access or needs.
  - **Family Size**: A larger family size negatively affects the amount of agricultural credit accessed, likely due to higher financial burdens and divided resources.
  - **Resource Availability**: The size of the operated area, value of the land, and the presence of farming equipment significantly enhance a farmer's creditworthiness and potential to borrow larger sums.
  - **Household Income**: Higher annual household incomes improve farmers' borrowing capacity, enabling them to secure more substantial loans.

- **Diverse Financing**: Farmers accessing credit from multiple sources, including cooperatives, tend to secure larger loans, underscoring the benefits of diversified financial engagements.

➢ **Constraints to credit Access:**

- **High interest rates**: The major constraint identified by 91% of farmers is the high interest rates charged on agricultural credit.
- **Group lending:** Around 60% of farmers had issues with group lending as financial institutions may be more willing to lend to groups due to risk-sharing among multiple borrowers.
- **Mortgage requirements:** Around 43 % of the farmers also had issues with mortgage requirements.
- **Non-receipt of applied amount**: About 36 % of farmers did not receive the applied amount which is another major issue with agricultural credit access.

## 5.1. Factors Influencing Agricultural Credit Access for Farmers in Odisha

### *5.1.1. Descriptive statistics*

The study shows that around 84 per cent of the farmers have accessed credit and most of them have taken an amount between the value of Rs. 50000 and Rs. 1 lakh as agricultural credit. The higher number of farmers has an education level of primary only with a mean value of 0.398. The next category of education in which most of the farmers come under is literature followed by illiterate farmers. Overall, the literacy level of farmers in Odisha is poor, with a lower than matriculation level of education. The average age of the farmers is around 46 and around 30 per cent of the farmers are from ST background and 13 per cent from a SC background. However, a high majority of the farmers might fall into the other than ST and SC classes. 68 per cent of farmers are male only, and only 10 per cent of the farmers have jobs other than agriculture. The average family size of the farmers is around 5 members per household. The households with a joint family system come to around 20 per cent only.

The average income of the household is around Rs. 1.2 lakhs and the land value is around Rs. 76 lakhs. The equipment value, however, comes to around Rs. 70000 only which shows the lower usage of equipment or technology in farming by Odisha's farmers. A higher number of farmers are dependent on co-operative banks or societies for accessing agricultural credit followed by micro finance banks or SHGs. The average distance between the financial

institutions and the farmer's household is around 6 km and around 60 per cent of the farmers have used the benefits of Direct Benefit Transfer (DBT) and Kisan Credit Card (KCC) schemes. Around 34 per cent of farmers have Jan Dhan account and 27 per cent have participated in Krishi Melas.

Around 48 per cent of the agricultural land is unirrigated and 40 per cent land is fully irrigated. About 93 per cent of farmers are considered to have charged higher interest rates for agricultural credit and 13 per cent had access to bank correspondents. Sundergarh district has comparatively lower representation in the entire sample. Table 5.1 depicts the descriptive statistics of the study.

**Table 5.1 Descriptive Statistics**

| Variable | Obs | Mean | Std. dev. |
|---|---|---|---|
| ***Loanee*** | 1,036 | 0.842 | 0.365 |
| ***Loan Amount*** | 872 | 1.610 | 0.733 |
| ***Age*** | 1,036 | 46.170 | 11.331 |
| ***Education*** | | | |
| **Illiterate** | 1,036 | 0.111 | 0.314 |
| **Literate** | 1,036 | 0.232 | 0.422 |
| **Primary** | 1,036 | 0.398 | 0.490 |
| **Matriculation** | 1,036 | 0.036 | 0.186 |
| **Secondary** | 1,036 | 0.149 | 0.356 |
| **Graduation and above** | 1,036 | 0.075 | 0.264 |
| ***Social Class*** | | | |
| **ST** | 1,036 | 0.297 | 0.457 |
| **SC** | 1,036 | 0.134 | 0.341 |
| ***Gender*** | 1,036 | 0.682 | 0.466 |
| ***Occupation*** | 1,036 | 0.106 | 0.308 |
| ***Family size*** | 1,036 | 4.863 | 1.766 |
| ***Family System*** | 1,036 | 0.202 | 0.401 |
| ***Farmer Ratio*** | 1,036 | 0.421 | 0.207 |
| ***Income*** | 1,036 | 120248.6 | 318071.5 |
| ***Operated Area*** | 1,036 | 1.351 | 1.614 |
| ***Land*** | 1,036 | 7657589 | 67500000 |
| ***Equipment*** | 1,036 | 70766.41 | 273767.7 |
| ***Credit Source*** | | | |
| **Co-operative banks/Societies** | 872 | 0.630 | 0.483 |
| **Scheduled commercial bank** | 872 | 0.029 | 0.167 |
| **Rural banks** | 872 | 0.011 | 0.107 |
| **Micro-finance banks/SHGs** | 872 | 0.267 | 0.443 |
| **Multiple sources/others** | 872 | 0.063 | 0.243 |
| ***Distance*** | 1,036 | 6.218 | 3.768 |
| ***DBT*** | 1,036 | 0.614 | 0.487 |

| | | | |
|---|---|---|---|
| ***KCC*** | 1,036 | 0.603 | 0.489 |
| ***Jan-Dhan Account*** | 1,036 | 0.339 | 0.474 |
| ***Krishi Mela*** | 1,036 | 0.270 | 0.444 |
| ***Irrigation*** | | | |
| **Unirrigated** | 1,036 | 0.482 | 0.500 |
| **Partially irrigated** | 1,036 | 0.117 | 0.321 |
| **Fully irrigated** | 1,036 | 0.402 | 0.490 |
| ***Interest*** | 1,036 | 0.920 | 0.272 |
| ***Bank Correspondent*** | 1,036 | 0.132 | 0.339 |
| ***Districts*** | | | |
| **Sambalpur** | 1,036 | 0.103 | 0.304 |
| **Sundergarh** | 1,036 | 0.074 | 0.262 |
| **Mayurbhanj** | 1,036 | 0.10 | 0.302 |
| **Kalahandi** | 1,036 | 0.098 | 0.298 |
| **Balasore** | 1,036 | 0.101 | 0.302 |
| **Keonjhar** | 1,036 | 0.125 | 0.331 |
| **Gajapati** | 1,036 | 0.097 | 0.297 |
| **Nabrangpur** | 1,036 | 0.093 | 0.290 |
| **Malkangiri** | 1,036 | 0.106 | 0.308 |
| **Koraput** | 1,036 | 0.099 | 0.299 |

***Source:*** **Author's calculation**

### *5.1.2. Regression results*

The ordered probit regression with sample selection has shown the factors that are impacting the access to credit on the selection equation and the factors impacting the amount borrowed on the outcome equation. The Wald-test statistic shows a high significance (Wald chi-square – 232.88***), which represents the model is a good fit. Further, regarding the likelihood-ratio test (LR test), it shows a p-value of 0.0330, which indicates that the ordered probit with the sample selection model gives better results than the simple ordered probit model. The findings show that primary-level and secondary-level education have a significant positive impact on the decision to take agricultural credit. This may happen due to the presence of a higher number of farmers in the primary-level education category, and in the education levels higher than that, most farmers come under secondary-level education. Access to higher education may be limited in rural areas of Odisha due to factors such as distance to educational institutions, affordability, and cultural norms. As a result, the impact of higher education on agricultural credit access may be less pronounced compared to primary and higher secondary education levels.

As discussed in Case Study 14, the presence of KCC is an important factor in determining the decision to take a loan as KCC has a significant positive impact (β = 0.3351***) on loan decisions. Moreover, participation in Krishi Melas appears to be advantageous for farmers in acquiring knowledge about various loan schemes and institutions offering agricultural credit. This participation demonstrates a notable positive influence on loan accessibility (β = 0.4772***). Distance (β = -0.0277*) and Interest rates (β = -1.01***) have a significant negative impact on the decision to take a loan. The impact of Jan Dhan accounts, bank correspondents, and DBT initiatives are found to be insignificant, however these have a negative association. While these initiatives may not fully replace the need for agricultural credit, they appear to provide financial support that reduces the urgency to seek loans. These variables' negative impact on loan-taking decisions could be interpreted as a positive outcome of financial inclusion and subsidy distribution policies, suggesting that direct access to funds can empower farmers to manage their finances with reduced dependency on loans.

In the identification of the factors that impact the loan amount, the study found that the matriculation level of education has a significant negative impact (β = -0.5945**) whereas secondary level of education has a significant positive impact (β = 0.4571**). The secondary level education may equip individuals with more advanced agricultural skills and financial understanding, positively influencing their creditworthiness. The negative impact of the matriculation-level farmers might be because of factors other than education as the overall sample has only 3 per cent of farmers with matriculation-level education. Further, the study found that farmers belonging to the ST class have chance of getting lesser credit amounts. The ST category social class of farmers has a negative impact on (β = -0.2242**) agricultural credit. Gender also seems to have a negative impact on the amount borrowed (β = -0.3143**) which means male has ability to borrow a lesser amount when compared to female farmers. This may probably happen due to the expectations of female farmers to be more credible and prompt in repayments, and further, there are several government schemes supporting females to improve the social status of women. The family size was also found to have a negative impact (β = -0.0588) on the amount borrowed. The larger the size of the family, the smaller the amount borrowed. Larger families may have limited resources to allocate towards loan repayments, reducing their perceived creditworthiness and managing a larger household may lead to greater financial instability, raising concerns for lenders about the borrower's ability to meet repayment obligations consistently.

Factors like household income (β = 0.1832), farming area (β = 0.1106), land value (β = 0.1853) and equipment value (β = 0.0398) have a significant positive impact on the amount borrowed. All these factors improve the income-generating capacity, facilitate repayment capacity, reduce the risk of lenders and improve the credit worthiness, thus ultimately leading to higher levels of credit. Further, the KCC also improves the amount borrowing capacity of the farmers, leading to a higher amount of credit borrowed. Finally, the higher chances of getting a large amount of credit are from multiple sources, which mostly include co-operatives and others. Table 5.2 depicts the regression results of the determinants or factors impacting agricultural credit in Odisha.

**Table 5.2** Regression results

| **Variables** | **Outcome equation Loan Amount** | | **Selection equation Loanee (Yes -1; No-0)** | |
|---|---|---|---|---|
| | **Coefficient** | **P-value** | **Coefficient** | **P-value** |
| ***Age*** | 0.2403 | | 0.3638 | |
| ***Education (Base- Illiterate)*** | | | | |
| **Literate** | 0.0625 | | 0.0895 | |
| **Primary** | 0.0863 | | 0.4024 | * |
| **Matriculation** | -0.5945 | ** | 0.3792 | |
| **Secondary** | 0.4571 | ** | 0.5300 | ** |
| **Graduation and above** | 0.4180 | | 0.1835 | |
| ***Social Class*** | | | | |
| **SC (Yes-1; No-0)** | -0.1638 | | 0.0100 | |
| **ST (Yes-1; No-0)** | -0.2242 | ** | 0.1024 | |
| ***Gender* (Male -1; Otherwise -0)** | -0.3143 | ** | -0.2146 | |
| ***Occupation*** | -0.0692 | | 0.3194 | |
| ***Family Size*** | -0.0588 | * | 0.0365 | |
| ***Family System*** | 0.2098 | | -0.0952 | |
| ***Operated Area*** | 0.1106 | *** | 0.1195 | |
| ***Income*** | 0.1832 | ** | -0.0757 | |
| ***Land*** | 0.1853 | *** | 0.0025 | |
| ***Equipment*** | 0.0398 | *** | 0.0267 | |
| ***KCC*** | 0.3165 | *** | 0.3351 | *** |
| ***Credit Source* (Base- Co-operative banks/societies)** | | | | |
| **Scheduled commercial bank** | 0.3001 | | | |
| **Rural banks** | 0.0064 | | | |
| **Microfinance banks/SHGs** | 0.2731 | | | |
| **Multiple sources or others** | 0.5681 | *** | | |
| ***Farmer Ratio*** | | | 0.1925 | |
| ***DBT*** | | | -0.0722 | |
| ***Jan-Dhan Account*** | | | -0.0375 | |

| | | | | |
|---|---|---|---|---|
| ***Krishi Mela*** | | | 0.4772 | ** |
| ***Distance*** | | | -0.0277 | * |
| ***Interest*** | | | -1.0100 | *** |
| ***Bank Correspondent*** | | | -0.2526 | |
| ***Irrigation* (Base- Unirrigated)** | | | | |
| **Partially irrigated** | | | 0.0184 | |
| **Fully irrigated** | | | -0.0677 | |
| ***Districts (Base- Sambalpur)*** | | | | |
| **Sundergarh** | | | -5.8447 | |
| **Mayurbhanj** | | | -4.6721 | |
| **Kalahandi** | | | -4.1601 | |
| **Balasore** | | | -3.5895 | |
| **Keonjhar** | | | -4.1967 | |
| **Gajapati** | | | -3.0326 | |
| **Nabrangpur** | | | -5.3110 | |
| **Malkangiri** | | | -4.7866 | |
| **Koraput** | | | -5.4402 | |
| ***Constant*** | | | 5.5678 | |
| **/cut1** | 5.9649 | ** | | |
| **/cut2** | 7.3581 | *** | | |
| **/cut3** | 8.6290 | *** | | |
| **/cut4** | 9.5814 | *** | | |
| **/athrho** | 0.5604 | * | | |
| ***No. of sample households*** | 872 | | 1036 | |

*Source:* Author's calculation

Note: LR test of indep. eqns. (rho = 0): chi2(1) = 4.54 Prob > chi2 = 0.0330

**Table 5.3** Marginal effects of outcome equation

| | Marginal effects | z | P-value |
|---|---|---|---|
| **Age** | 0.0618 | 1.53 | 0.126 |
| **Education (Base- Illiterate)** | | | |
| **Literate** | 0.0204 | 0.53 | 0.595 |
| **Primary** | 0.0770 | 1.9 | 0.057 |
| **Matriculation** | 0.0769 | 1.36 | 0.175 |
| **Secondary** | 0.0880 | 1.94 | 0.053 |
| **Graduation and above** | 0.0580 | 0.84 | 0.403 |
| **Social Class** | 0.0103 | 0.35 | 0.727 |
| **SC (Yes-1; No-0)** | 0.0180 | 0.77 | 0.443 |
| **Gender (Male -1; Otherwise -0)** | -0.0434 | -1.59 | 0.111 |
| **Occupation** | 0.0442 | 1.34 | 0.182 |
| **Family Size** | 0.0068 | 0.92 | 0.356 |
| **Family System** | -0.0155 | -0.53 | 0.593 |
| **Farmer Ratio** | 0.0412 | 0.78 | 0.437 |
| **Operated Area** | 0.0227 | 1.49 | 0.135 |
| **Income** | -0.0161 | -1.03 | 0.301 |

| | | | |
|---|---|---|---|
| **Land** | 0.0003 | 0.06 | 0.95 |
| **Equipment** | 0.0032 | 1.05 | 0.295 |
| **DBT** | -0.0043 | -0.19 | 0.846 |
| **KCC** | 0.0565 | 2.52 | 0.012 |
| **Jan-Dhan Account** | -0.0003 | -0.02 | 0.986 |
| **Krishi Mela** | 0.0905 | 2.54 | 0.011 |
| **Distance** | -0.0049 | -1.84 | 0.065 |
| **Interest Rate** | -0.1557 | -4.16 | 0 |
| **Bank Correspondent** | -0.0395 | -0.78 | 0.434 |
| **Districts (Base- Sambalpur)** | | | |
| **Sundergarh** | -0.7530 | -0.06 | 0.953 |
| **Mayurbhanj** | -0.5815 | -0.05 | 0.963 |
| **Kalahandi** | -0.4711 | -0.04 | 0.97 |
| **Balasore** | -0.4010 | -0.03 | 0.975 |
| **Keonjhar** | -0.4936 | -0.04 | 0.969 |
| **Gajapati** | -0.2909 | -0.02 | 0.982 |
| **Nabrangpur** | -0.6460 | -0.05 | 0.959 |
| **Malkangiri** | -0.5919 | -0.05 | 0.963 |
| **Koraput** | -0.6797 | -0.05 | 0.957 |
| **Irrigation (Base- Unirrigated)** | | | |
| **Partially irrigated** | 0.0085 | 0.31 | 0.753 |
| **Fully irrigated** | 0.0041 | 0.15 | 0.882 |

Table 5.3 depicts the results of marginal effects of the probit estimate run on the selection equation. The marginal effects from the selection equation show that several factors significantly influence the probability of financial inclusion. Higher education levels, such as primary and secondary education, are associated with higher probabilities of inclusion, although the effects are only marginally significant. Gender appears to have a negative effect on financial inclusion for males, but this result is not statistically significant. Notably, factors such as having a Kisan Credit Card (KCC) and attending Krishi Melas (agricultural fairs) show positive and significant effects, increasing the probability of financial inclusion by 5.7 and 9 percentage points, respectively. This suggests that access to financial tools and agricultural outreach programs may play a critical role in promoting inclusion.

Other key results include the strong, negative effect of higher interest rates, which reduce the probability of financial inclusion by 15.6 percentage points, underscoring that affordability remains a critical barrier. Distance from financial institutions also has a nearly significant negative effect, implying that proximity may affect access. District-specific effects are largely insignificant, suggesting minimal variation in financial inclusion across different districts. Together, these findings highlight that educational outreach, financial tools like the

KCC, reduced interest rates, and proximity to services could be crucial focus areas for enhancing financial inclusion among farmers.

Overall, the findings suggest that education, proximity to financial services, having a Kisan Credit Card, attendance at agricultural fairs, and interest rates are among the most impactful factors for financial inclusion. The significant negative effect of interest rates emphasizes that affordability is a primary concern, while accessibility (distance) and agricultural support mechanisms (Krishi Mela, KCC) show promise as effective tools for improving financial inclusion rates.

## 5.2. Challenges Faced by Farmers in Accessing Agricultural Credit

**KEY FINDINGS**

- **High Interest Rates**: The major constraint reported by farmers is the exorbitant interest rates charged on agricultural credit, as 90 per cent of the farmers accessing agricultural credit have reported the same.
- **Absence of Bribery**: Positively, none of the farmers had to give bribes to officers to obtain agricultural credit, indicating a level of integrity and efficiency in the bureaucratic system.
- **Issues with Group Lending**: Group lending is problematic in most districts, serving as a significant constraint due to increased individual risk and frequent group disagreements.
- **Cumbersome Bank Procedures**: Farmers in Sundergarh district face issues like cumbersome bank procedures, delays in loan disbursement, and individual collateral requirements.
- **Insufficient Loan Amounts**: Farmers in Kalahandi, Balasore, and Sundergarh have reported receiving loan amounts that are less than what they applied for.
- **Mortgage Requirements**: The requirement of a mortgage is a major constraint for farmers in the districts of Sambalpur, Mayurbhanj, and Keonjhar.

The number of farmers who have accessed agricultural credit is 872. Among them, a higher number have availed credit in Keonjhar, Sambalpur, Balasore, and Gajapati. In contrast, Sundergarh, Nabrangpur, and Koraput have a larger proportion of farmers who have not accessed credit. The primary constraint identified by farmers, based on the overall sample, is the high interest rates charged on agricultural credit. This issue was mentioned by 91 per cent of the sample as a significant barrier to accessing credit. Group lending is considered the next constraint for greater access to agricultural credit. While group lending can serve as an alternative to traditional collateral—allowing farmers without assets to access credit through collective mechanisms—it presents both opportunities and challenges. Financial institutions may be more willing to lend to groups due to risk-sharing among multiple borrowers, which reduces the impact of a single default. However, in Odisha, more than 60 per cent of farmers view it as a barrier. Individual farmers' risks increase because one member's default can jeopardize the entire group. Additionally, there are frequent disagreements within groups, further complicating the lending process. Table 5.4 depicts the major constraints faced by the farmers in Odisha.

To address the agricultural credit access and constraints faced by farmers at the district level in Odisha, the findings can be summarized with a focused discussion on each district's distinct challenges:

- **High Interest Rates**: This is identified as the predominant issue across districts, with a notable 91% of farmers expressing concern. Farmers in **Gajapati** and **Balasore** report particularly high levels of concern about interest rates, with close to 100% of respondents in these areas indicating it as a barrier.
- **Group Lending Constraints**: Group lending was reported as a major hindrance by over 60% of farmers. In districts such as **Balasore** and **Gajapati**, this constraint is even more acute, with more than 95% of farmers facing issues due to the complexities and risk-sharing involved in group lending. This reflects an environment where, despite potential benefits, group lending’s risks and internal disagreements overshadow its advantages.
- **Non-Receipt of Applied Loan Amount**: This issue is highly concentrated in **Kalahandi** and **Balasore**, where all farmers reported not receiving the full credit amount applied for. This outcome signifies a significant administrative or processing barrier in these districts, impacting farmers’ trust in financial institutions and their ability to plan for agricultural expenses.

- **Districts with a High Proportion of Non-Borrowers**: **Sundergarh**, **Nabarangpur**, and **Koraput** have a high proportion of farmers who have not accessed agricultural credit. This suggests either limited availability of financial services, higher perceived barriers, or lower demand for credit due to economic or infrastructural reasons specific to these areas.
- **Individual Collateral Requirements**: This constraint is most significant in **Sundergarh** and **Mayurbhanj**, where collateral requirements impact farmers' ability to access credit. The chi-square analysis further confirms that individual collateral poses a greater obstacle in these districts than in others, potentially due to limited collateral assets among the farmers.
- **Cumbersome Bank Procedures and Loan Delays**: Farmers in **Sundergarh** and **Mayurbhanj** also report more issues with cumbersome bank procedures and delays in loan disbursement. These procedural issues discourage timely access to credit, affecting planting cycles and harvest-related decisions.
- **Requirement of Mortgage**: Farmers in **Sambalpur**, **Mayurbhanj**, and **Keonjhar** report higher incidences of mortgage requirements as a credit constraint, a factor that restricts many small-scale farmers who lack sufficient assets from accessing credit.
- **Positive Indicator - No Reports of Bribery**: across all districts, farmers reported any issues with bribery in credit processing. This suggests a positive development in terms of bureaucratic transparency and could help in building farmers' trust in the system.

**Table 5.4** Constraints faced by farmers while borrowing agricultural credit

| Constraints | *1* | | *2* | | *3* | | *4* | | *5* | | *6* | | *7* | | *8* | | *9* | | *10* | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| *a) Individual collateral issues* | 9 | 23.68 | 12 | 13.04 | 0 | 0 | 0 | 0 | 3 | 2.42 | 0 | 0 | 0 | 0 | 6 | 6.59 | 6 | 5.61 | 5 | 8.33 | **41** | **4.70** |
| *b) Cumbersome bank procedures* | 14 | 36.84 | 9 | 9.78 | 0 | 0 | 0 | 0 | 4 | 3.23 | 0 | 0 | 1 | 1.72 | 4 | 4.40 | 8 | 7.48 | 6 | 10 | **46** | **5.28** |
| *c) Delay in loan disbursement* | 8 | 21.05 | 12 | 13.04 | 0 | 0 | 0 | 0 | 4 | 3.23 | 0 | 0 | 3 | 5.17 | 10 | 10.99 | 8 | 7.48 | 8 | 13.33 | **53** | **6.08** |
| *d) Non-receipt of the applied amount* | 26 | 68.42 | 24 | 26.09 | 98 | 100 | 104 | 100 | 9 | 7.26 | 0 | 0 | 22 | 37.93 | 19 | 20.88 | 2 | 1.87 | 16 | 26.67 | **320** | **36.69** |
| *e) Bribe to Officer* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| *f) Requirement of mortgage* | 16 | 42.11 | 73 | 79.35 | 22 | 22.45 | 0 | 0 | 93 | 75.00 | 0 | 0 | 7 | 12.07 | 38 | 41.76 | 100 | 93.46 | 30 | 50 | **379** | **43.46** |
| *g) High interest rates* | 28 | 73.68 | 80 | 86.96 | 92 | 93.88 | 102 | 98.08 | 114 | 91.94 | 98 | 98 | 46 | 79.31 | 73 | 80.22 | 107 | 100 | 56 | 93.33 | **796** | **91.28** |
| *h) Group lending as a constraint* | 24 | 63.16 | 26 | 28.26 | 56 | 57.14 | 102 | 98.08 | 40 | 32.26 | 95 | 95 | 38 | 65.52 | 44 | 48.35 | 67 | 62.62 | 36 | 60 | **528** | **60.55** |
| **Total respondents** | **38** | | **92** | | **98** | | **104** | | **124** | | **100** | | **58** | | **91** | | **107** | | **60** | | **872** | |

*Source*: Data collected through survey

*Note:* The titles 1 to 10 represents the ten districts and each district is represented as follows; 1 – Sundergarh, 2 – Mayurbhanj, 3 – Kalahandi, 4 – Balasore, 5 – Keonjhar, 6 – Gajapati, 7 – Nabrangpur, 8 – Malkangiri, 9 – Sambalpur, 10 – Koraput. Further, 'No.' represents the number of respondents who marked yes to the query asked regarding the different constraints discussed. The '%' is the percentage of the number of respondents to the total number of respondents, which in the case of district-wise data is the number of respondents to the total respondents who availed credit in each district.

Additionally, credit constraints are analysed using a chi-square test to understand whether income levels, education, caste, and district-wise disparities significantly impact the credit constraints faced by farmers who have accessed agricultural credit. Table 5.5 to 5.11 depicts the chi-square test results of the different constraints explored by the study, except the bribery-related concern as none of the farmers reported bribery issues. The analysis covers seven main issues: individual collateral, cumbersome bank procedures, delays in loan disbursement, non-receipt of applied amount, requirement of mortgage, high interest rates, and group lending as constraint.

- **Individual Collateral Issues**

  **Annual Income**: The chi-square test result ($\chi^2$ = 5.7213, p-value = 0.221) indicates that there is no significant impact of annual income on individual collateral issues.

  **Education**: The chi-square test result ($\chi^2$ = 25.5056, p-value = 0.00) shows a highly significant impact of education on individual collateral issues, with illiterate farmers and those with only primary education facing more collateral issues.

  **Caste**: The chi-square test result ($\chi^2$ = 0.2138, p-value = 0.89) indicates that caste does not have a significant impact on individual collateral issues.

  **District**: The chi-square test result ($\chi^2$ = 66.7374, p-value = 0.00) reveals significant district-wise disparities, with districts like Sundergarh and Mayurbhanj facing higher collateral issues.

- **Cumbersome Bank Procedures**

  **Annual Income**: The chi-square test result ($\chi^2$ = 6.3708, p-value = 0.173) suggests no significant impact of annual income on cumbersome bank procedures.

  **Education**: The chi-square test result ($\chi^2$ = 23.8053, p-value = 0.00) indicates a significant impact of education on experiencing cumbersome bank procedures, with illiterate farmers and those with only primary education encountering more issues.

  **Caste**: The chi-square test result ($\chi^2$ = 0.3141, p-value = 0.855) shows that caste does not significantly affect experiences with cumbersome bank procedures.

**District**: The chi-square test result ($\chi^2$ = 102.702, p-value = 0.00) points to significant district-wise differences, with Sundergarh and Mayurbhanj facing more problems with bank procedures.

- **Delay in Loan Disbursement**

  **Annual Income**: The chi-square test result ($\chi^2$ = 7.3046, p-value = 0.121) indicates no significant impact of annual income on delays in loan disbursement.

  **Education**: The chi-square test result ($\chi^2$ = 16.0939, p-value = 0.007) shows a significant impact of education, with primary education and below facing more delays.

  **Caste**: The chi-square test result ($\chi^2$ = 0.21, p-value = 0.9) suggests that caste does not significantly impact delays in loan disbursement.

  **District**: The chi-square test result ($\chi^2$ = 53.884, p-value = 0.00) reveals significant district-wise differences, with districts like Sundergarh and Mayurbhanj facing higher delays.

- **Non-Receipt of the Applied Amount**

  **Annual Income**: The chi-square test result ($\chi^2$ = 63.072, p-value = 0.00) shows a highly significant impact of annual income on the non-receipt of the applied amount. Farmers with lower incomes (< ₹50,000) face more issues of non-receipt.

  **Education**: The chi-square test result ($\chi^2$ = 34.0349, p-value = 0.00) reveals a significant impact of education on the non-receipt of the applied amount, with primary-educated farmers facing more issues.

  **Caste**: The chi-square test result ($\chi^2$ = 39.4825, p-value = 0.00) indicates a significant impact of caste on the non-receipt of the applied amount, with ST and SC farmers facing more issues.

  **District**: The chi-square test result ($\chi^2$ = 541.913, p-value = 0.00) shows significant district-wise differences, with districts like Kalahandi and Gajapati facing fewer issues of non-receipt.

- **High Interest Rates**

  **Annual Income**: The chi-square test result ($\chi^2$ = 4.8249, p-value = 0.306) shows no significant impact of annual income on the issue of high interest rates.

  **Education**: The chi-square test result ($\chi^2$ = 21.3515, p-value = 0.001) reveals a significant impact of education on high interest rates. Illiterate farmers and those with primary education face more issues with high interest rates.

**Caste**: The chi-square test result ($\chi^2$ = 3.9202, p-value = 0.141) indicates no significant impact of caste on high interest rates.

**District**: The chi-square test result ($\chi^2$ = 64.5435, p-value = 0.00) shows significant district-wise differences, with districts like Sundergarh and Sambalpur facing more issues with high interest rates.

- **Requirement of Mortgage**

  **Annual Income**: The chi-square test result ($\chi^2$ = 8.551, p-value = 0.07) indicates a marginally significant impact of annual income on the requirement of a mortgage.

  **Education**: The chi-square test result ($\chi^2$ = 93.8988, p-value = 0.00) shows a highly significant impact of education on the requirement of a mortgage, with illiterate farmers facing fewer mortgage requirements.

  **Caste**: The chi-square test result ($\chi^2$ = 0.052, p-value = 0.975) suggests no significant impact of caste on the requirement of a mortgage.

  **District**: The chi-square test result ($\chi^2$ = 406.119, p-value = 0.00) highlights significant district-wise disparities, with districts like Balasore and Gajapati facing fewer mortgage requirement.

- **Group Lending as a Constraint**

  **Annual Income**: The chi-square test result ($\chi^2$ = 33.2873, p-value = 0.00) shows a highly significant impact of annual income on group lending as a constraint. Farmers with lower annual incomes (< ₹50,000) face fewer constraints compared to those with higher incomes.

  **Education**: The chi-square test result ($\chi^2$ = 17.8866, p-value = 0.003) indicates a significant impact of education on group lending constraints. Farmers with higher education levels face fewer group lending issues.

  **Caste**: The chi-square test result ($\chi^2$ = 0.4755, p-value = 0.788) suggests no significant impact of caste on group lending constraints.

  **District**: The chi-square test result ($\chi^2$ = 199.756, p-value = 0.00) highlights significant district-wise disparities, with districts like Balasore and Gajapati facing more group lending constraints.

Overall, there are significant district disparities for all the constraints indicating the district wise differences play a crucial role in the agricultural-related credit constraints faced by farmers. Education levels are another significant factor impacting all the constraints. The education level

of farmers, while only caste is significantly impacting the non-receipt of applied amount. Income levels are significantly affecting non-receipt of applied amount and group lending constraints, while have a weak significance in case of requirement of a mortgage.

**Table 5.5** Chi-square test results regarding Individual collateral issues as a constraint

| **Individual collateral issues** | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| **Annual income** | | | | | |
| ***Less than 50,000*** | 208 | 15 | 223 | 5.7213 | 0.221 |
| ***50,000- 1 lakh*** | 283 | 11 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 143 | 4 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 56 | 5 | 61 | | |
| ***Above 2 lakhs*** | 141 | 6 | 147 | | |
| **Total** | 831 | 41 | 872 | | |
| **Education** | | | | | |
| ***Illiterate*** | 73 | 9 | 82 | 25.5056 | 0.00 |
| ***Below primary*** | 158 | 0 | 158 | | |
| ***Primary*** | 368 | 17 | 385 | | |
| ***Matriculation*** | 30 | 2 | 32 | | |
| ***Secondary*** | 127 | 13 | 140 | | |
| ***Graduation and above*** | 75 | 0 | 75 | | |
| **Total** | 831 | 41 | 872 | | |
| **Caste** | | | | | |
| ***ST*** | 229 | 12 | 241 | 0.2138 | 0.89 |
| ***SC*** | 107 | 6 | 113 | | |
| ***Others*** | 495 | 23 | 518 | | |
| **Total** | 831 | 41 | 872 | | |
| **District** | | | | | |
| ***Sundergarh*** | 29 | 9 | 38 | 66.7374 | 0.00 |
| ***Mayurbhanj*** | 80 | 12 | 92 | | |
| ***Kalahandi*** | 98 | 0 | 98 | | |
| ***Balasore*** | 104 | 0 | 104 | | |
| ***Keonjhar*** | 121 | 3 | 124 | | |
| ***Gajapati*** | 100 | 0 | 100 | | |
| ***Nabrangpur*** | 58 | 0 | 58 | | |
| ***Malkangiri*** | 85 | 6 | 91 | | |
| ***Sambalpur*** | 101 | 6 | 107 | | |
| ***Koraput*** | 55 | 5 | 60 | | |
| **Total** | 831 | 41 | 872 | | |

*Source:* Author's calculation

**Table 5.6** Chi-square test results regarding Cumbersome bank procedures as a constraint

| Cumbersome bank procedures | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| Annual income | | | | | |
| ***Less than 50,000*** | 207 | 16 | 223 | 6.3708 | 0.173 |
| ***50,000- 1 lakh*** | 284 | 10 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 140 | 7 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 55 | 6 | 61 | | |
| ***Above 2 lakhs*** | 140 | 7 | 147 | | |
| Total | 826 | 46 | 872 | | |
| Education | | | | | |
| ***Illiterate*** | 74 | 8 | 82 | 23.8053 | 0 |
| ***Below primary*** | 156 | 2 | 158 | | |
| ***Primary*** | 371 | 14 | 385 | | |
| ***Matriculation*** | 27 | 5 | 32 | | |
| ***Secondary*** | 126 | 14 | 140 | | |
| ***Graduation and above*** | 72 | 3 | 75 | | |
| Total | 826 | 46 | 872 | | |
| Caste | | | | | |
| ***ST*** | 229 | 12 | 241 | 0.3141 | 0.855 |
| ***SC*** | 108 | 5 | 113 | | |
| ***Others*** | 489 | 29 | 518 | | |
| Total | 826 | 46 | 8720 | | |
| District | | | | | |
| ***Sundergarh*** | 24 | 14 | 38 | 102.702 | 0 |
| ***Mayurbhanj*** | 83 | 9 | 92 | | |
| ***Kalahandi*** | 98 | 0 | 98 | | |
| ***Balasore*** | 104 | 0 | 104 | | |
| ***Keonjhar*** | 120 | 4 | 124 | | |
| ***Gajapati*** | 100 | 0 | 100 | | |
| ***Nabrangpur*** | 57 | 1 | 58 | | |
| ***Malkangiri*** | 87 | 4 | 91 | | |
| ***Sambalpur*** | 99 | 8 | 107 | | |
| ***Koraput*** | 54 | 6 | 60 | | |
| Total | 826 | 46 | 872 | | |

*Source:* Author's calculation

**Table 5.7** Chi-square test results regarding Delay in loan disbursement as a constraint

| Delay in loan disbursement | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| **Annual income** | | | | | |
| ***Less than 50,000*** | 205 | 18 | 223 | 7.3046 | 0.121 |
| ***50,000- 1 lakh*** | 277 | 17 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 144 | 3 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 55 | 6 | 61 | | |
| ***Above 2 lakhs*** | 138 | 9 | 147 | | |
| **Total** | 819 | 53 | 872 | | |
| **Education** | | | | | |
| ***Illiterate*** | 79 | 3 | 82 | 16.0939 | 0.007 |
| ***Below primary*** | 146 | 12 | 158 | | |
| ***Primary*** | 366 | 19 | 385 | | |
| ***Matriculation*** | 27 | 5 | 32 | | |
| ***Secondary*** | 126 | 14 | 140 | | |
| ***Graduation and above*** | 75 | 0 | 75 | | |
| **Total** | 819 | 53 | 872 | | |
| **Caste** | | | | | |
| ***ST*** | 225 | 16 | 241 | 0.21 | 0.9 |
| ***SC*** | 106 | 7 | 113 | | |
| ***Others*** | 488 | 30 | 518 | | |
| **Total** | 819 | 53 | 872 | | |
| **District** | | | | | |
| ***Sundergarh*** | 30 | 8 | 38 | 53.884 | 0 |
| ***Mayurbhanj*** | 80 | 12 | 92 | | |
| ***Kalahandi*** | 98 | 0 | 98 | | |
| ***Balasore*** | 104 | 0 | 104 | | |
| ***Keonjhar*** | 120 | 4 | 124 | | |
| ***Gajapati*** | 100 | 0 | 100 | | |
| ***Nabrangpur*** | 55 | 3 | 58 | | |
| ***Malkangiri*** | 81 | 10 | 91 | | |
| ***Sambalpur*** | 99 | 8 | 107 | | |
| ***Koraput*** | 52 | 8 | 60 | | |
| **Total** | 819 | 53 | 872 | | |

*Source:* Author's calculation

**Table 5.8** Chi-square test results regarding Non-receipt of the applied amount as a constraint

| Non-receipt of the applied amount | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| **Annual income** | | | | | |
| ***Less than 50,000*** | 146 | 77 | 223 | 63.072 | 0 |
| ***50,000- 1 lakh*** | 226 | 68 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 91 | 56 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 30 | 31 | 61 | | |
| ***Above 2 lakhs*** | 59 | 88 | 147 | | |
| **Total** | 552 | 320 | 872 | | |
| **Education** | | | | | |
| ***Illiterate*** | 68 | 14 | 82 | 34.0349 | 0 |
| ***Below primary*** | 112 | 46 | 158 | | |
| ***Primary*** | 229 | 156 | 385 | | |
| ***Matriculation*** | 25 | 7 | 32 | | |
| ***Secondary*** | 84 | 56 | 140 | | |
| ***Graduation and above*** | 34 | 41 | 75 | | |
| **Total** | 552 | 320 | 872 | | |
| **Caste** | | | | | |
| ***ST*** | 183 | 58 | 58 | 39.4825 | 0 |
| ***SC*** | 85 | 28 | 28 | | |
| ***Others*** | 284 | 234 | 234 | | |
| **Total** | 552 | 320 | 872 | | |
| **District** | | | | | |
| ***Sundergarh*** | 12 | 26 | 38 | 541.913 | 0 |
| ***Mayurbhanj*** | 68 | 24 | 92 | | |
| ***Kalahandi*** | 0 | 98 | 98 | | |
| ***Balasore*** | 0 | 104 | 104 | | |
| ***Keonjhar*** | 115 | 9 | 124 | | |
| ***Gajapati*** | 100 | 0 | 100 | | |
| ***Nabrangpur*** | 36 | 22 | 58 | | |
| ***Malkangiri*** | 72 | 19 | 91 | | |
| ***Sambalpur*** | 105 | 2 | 107 | | |
| ***Koraput*** | 44 | 16 | 60 | | |
| **Total** | 552 | 320 | 872 | | |

*Source:* Author's calculation

**Table 5.9** Chi-square test results regarding Requirement of mortgage as a constraint

| Requirement of mortgage | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| Annual income | | | | | |
| ***Less than 50,000*** | 111 | 112 | 223 | 8.551 | 0.07 |
| ***50,000- 1 lakh*** | 168 | 126 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 94 | 53 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 32 | 29 | 61 | | |
| ***Above 2 lakhs*** | 88 | 59 | 147 | | |
| Total | 493 | 379 | 872 | | |
| Education | | | | | |
| ***Illiterate*** | 56 | 26 | 82 | 93.8988 | 0 |
| ***Below primary*** | 134 | 24 | 158 | | |
| ***Primary*** | 193 | 192 | 385 | | |
| ***Matriculation*** | 10 | 22 | 32 | | |
| ***Secondary*** | 52 | 88 | 140 | | |
| ***Graduation and above*** | 48 | 27 | 75 | | |
| Total | **493** | **379** | **872** | | |
| Caste | | | | | |
| ***ST*** | 136 | 105 | 241 | 0.052 | 0.975 |
| ***SC*** | 65 | 48 | 113 | | |
| ***Others*** | 2920 | 226 | 518 | | |
| Total | **493** | **379** | **872** | | |
| District | | | | | |
| ***Sundergarh*** | 22 | 16 | 38 | 406.119 | 0 |
| ***Mayurbhanj*** | 19 | 73 | 92 | | |
| ***Kalahandi*** | 76 | 22 | 98 | | |
| ***Balasore*** | 104 | 0 | 104 | | |
| ***Keonjhar*** | 31 | 93 | 124 | | |
| ***Gajapati*** | 100 | 0 | 100 | | |
| ***Nabrangpur*** | 51 | 7 | 58 | | |
| ***Malkangiri*** | 53 | 38 | 91 | | |
| ***Sambalpur*** | 7 | 100 | 107 | | |
| ***Koraput*** | 30 | 30 | 60 | | |
| Total | 493 | 379 | 872 | | |

*Source:* Author's calculation

**Table 5.10** Chi-square test results regarding High interest rates as a constraint

| | High interest rates | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| **Annual income** | | | | | |
| ***Less than 50,000*** | 25 | 198 | 223 | 4.8249 | 0.306 |
| ***50,000- 1 lakh*** | 27 | 267 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 10 | 137 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 2 | 59 | 61 | | |
| ***Above 2 lakhs*** | 12 | 135 | 147 | | |
| **Total** | 76 | 796 | 872 | | |
| **Education** | | | | | |
| ***Illiterate*** | 12 | 70 | 82 | 21.3515 | 0.001 |
| ***Below primary*** | 23 | 135 | 158 | | |
| ***Primary*** | 25 | 360 | 385 | | |
| ***Matriculation*** | 6 | 26 | 32 | | |
| ***Secondary*** | 7 | 133 | 140 | | |
| ***Graduation and above*** | 3 | 72 | 75 | | |
| **Total** | 76 | 796 | 872 | | |
| **Caste** | | | | | |
| ***ST*** | 22 | 219 | 241 | 3.9202 | 0.141 |
| ***SC*** | 15 | 98 | 113 | | |
| ***Others*** | 39 | 479 | 518 | | |
| **Total** | 76 | 796 | 872 | | |
| **District** | | | | | |
| ***Sundergarh*** | 10 | 28 | 38 | 64.5435 | 0 |
| ***Mayurbhanj*** | 12 | 80 | 92 | | |
| ***Kalahandi*** | 6 | 92 | 98 | | |
| ***Balasore*** | 2 | 102 | 104 | | |
| ***Keonjhar*** | 10 | 114 | 124 | | |
| ***Gajapati*** | 2 | 98 | 100 | | |
| ***Nabrangpur*** | 12 | 46 | 58 | | |
| ***Malkangiri*** | 18 | 73 | 91 | | |
| ***Sambalpur*** | 0 | 107 | 107 | | |
| ***Koraput*** | 4 | 56 | 60 | | |
| **Total** | 76 | 796 | 872 | | |

*Source:* Author's calculation

**Table 5.11** Chi-square test results regarding Group lending as a constraint

| Group lending as a constraint | | | | | |
|---|---|---|---|---|---|
| | **No=0** | **Yes=1** | **Total** | **Chi-square test** | **P-value** |
| **Annual income** | | | | | |
| ***Less than 50,000*** | 124 | 99 | 223 | 33.2873 | 0 |
| ***50,000- 1 lakh*** | 100 | 194 | 294 | | |
| ***1 lakh – 1.5 lakhs*** | 47 | 100 | 147 | | |
| ***1.5 lakh- 2 lakhs*** | 20 | 41 | 61 | | |
| ***Above 2 lakhs*** | 53 | 94 | 147 | | |
| **Total** | 344 | 528 | 872 | | |
| **Education** | | | | | |
| ***Illiterate*** | 24 | 58 | 82 | 17.8866 | 0.003 |
| ***Below primary*** | 48 | 110 | 158 | | |
| ***Primary*** | 163 | 222 | 385 | | |
| ***Matriculation*** | 16 | 16 | 32 | | |
| ***Secondary*** | 68 | 72 | 140 | | |
| ***Graduation and above*** | 25 | 50 | 75 | | |
| **Total** | 344 | 528 | 872 | | |
| **Caste** | | | | | |
| ***ST*** | 91 | 150 | 241 | 0.4755 | 0.788 |
| ***SC*** | 44 | 69 | 113 | | |
| ***Others*** | 209 | 309 | 518 | | |
| **Total** | 344 | 528 | 872 | | |
| **District** | | | | | |
| ***Sundergarh*** | 14 | 24 | 38 | 199.756 | 0 |
| ***Mayurbhanj*** | 66 | 26 | 92 | | |
| ***Kalahandi*** | 42 | 56 | 98 | | |
| ***Balasore*** | 2 | 102 | 104 | | |
| ***Keonjhar*** | 84 | 40 | 124 | | |
| ***Gajapati*** | 5 | 95 | 100 | | |
| ***Nabrangpur*** | 20 | 38 | 58 | | |
| ***Malkangiri*** | 47 | 44 | 91 | | |
| ***Sambalpur*** | 40 | 67 | 107 | | |
| ***Koraput*** | 24 | 36 | 60 | | |
| **Total** | 344 | 528 | 872 | | |

*Source:* Author's calculation

**Agriculture Loans through Cooperative Banks**

Cooperative banks in rural Odisha play a pivotal role in facilitating access to loans for farmers, ensuring financial inclusion and empowerment. These banks typically sanction loans through a

democratic process, wherein members have a say in decision-making. Farmers can apply for loans based on their agricultural needs, such as purchasing seeds, fertilizers, or equipment, or for investment in their farms. The cooperative banks assess the creditworthiness of applicants, considering factors like land ownership, previous repayment history, and crop yield potential. The land holding plays a crucial factor in accessing loan and the credit amount directly varies with the land holding of farmers. The land below one acre attracts loan up to one lakh with zero per cent interest. Land holding beyond one acre attracts Two per cent interest with the credit amount varying between two lakhs to three lakhs.

This decentralized approach allows for tailored financial solutions, fostering trust and accountability within the community. By providing timely and affordable credit, cooperative banks have been instrumental in boosting agricultural productivity, supporting livelihoods, and driving socio-economic development in rural Odisha.

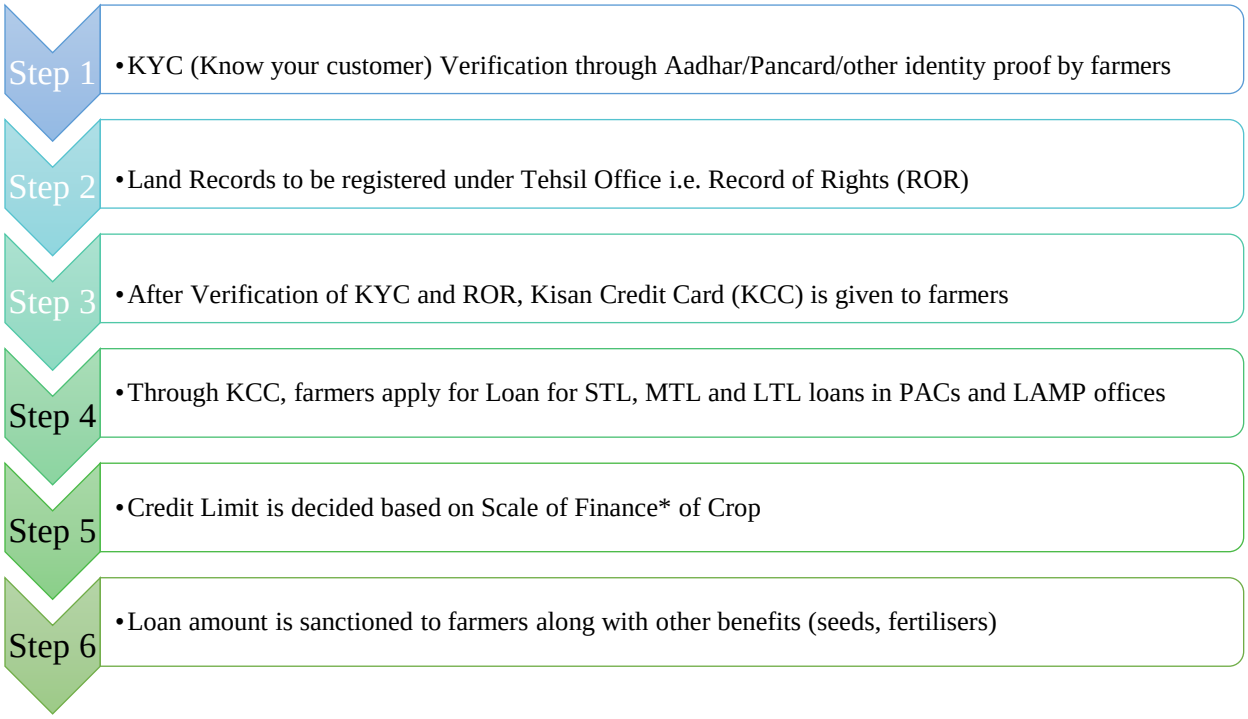



**Figure 5.1**: Process of Loan acquirement

*Scale of Finance- Scale of finance is the finance required for raising a crop per unit cultivated area, i.e. acre or hectare. The scale of finance for different crops in a district is decided every year by District Level Technical Committee (DLTC).

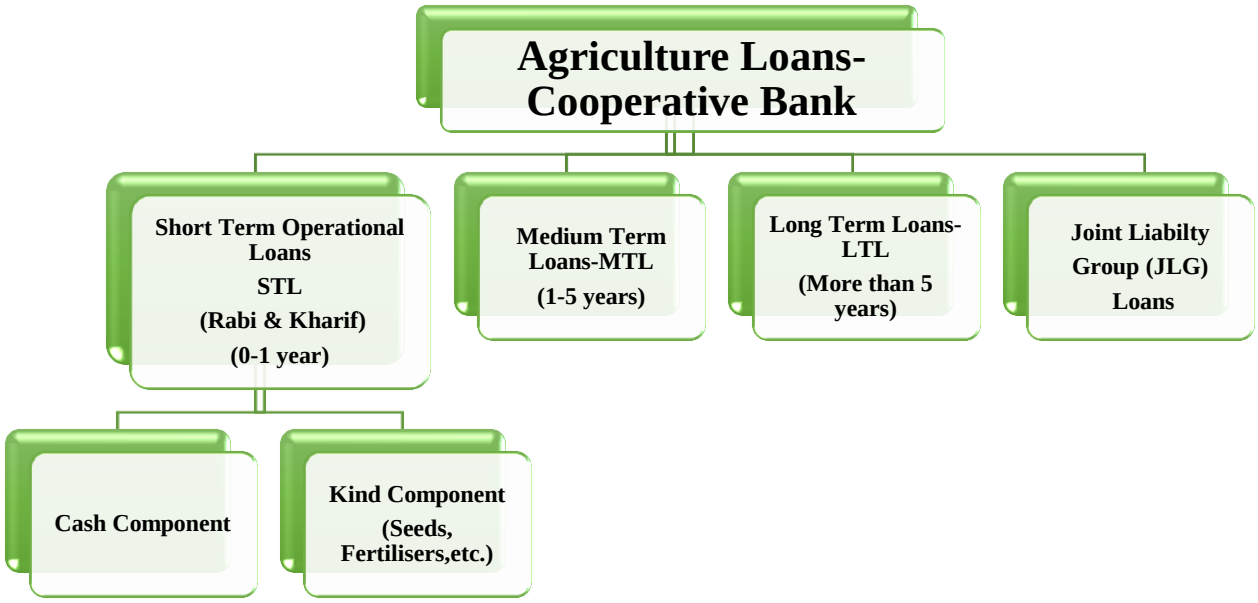



**Figure 5.2:** Agriculture Loan Facilities for Farmers

1. Short Term Loan:
    a. Short Term Crop Loan
    b. Handloom Loan for Weavers
    c. Cash Credit to Individual
    d. Cash Credit to SHG
    e. Balia Scheme
2. Medium Term Loans:
    a. Agriculture Term Loans for Farm Mechanisation
    b. Personal Loans
    c. Term Loan for Business
    d. Medium Term SHG loans
3. Long Term Loans:
    a. Agriculture Allied Activities
    b. House Loans
4. Joint Liability Group (JLG) Loans: This product is specifically tailored to cater the requirements of landless farmers. It requires 4 to 10 individuals in a group to avail the benefits of short term and long-term loans.

# Chapter 6 – Role of financial institutions in Agricultural Credit

This chapter deals with the examining the role of financial institutions on agricultural credit with respect to the perspectives of bankers. The interview response of 35 bank personnel in different levels of managerial position were analysed to provide insights into the policy implementation regarding agricultural credit, the level of initiatives taken by banks and the recommendations provided by the bankers on priority sector lending.

## 6.1. Determinants to Increase Loan Advances to Agriculture Farmers

Increasing loan advances to agriculture farmers requires a holistic approach that addresses creditworthiness, government support, technological adoption, market access, and farmer education. The responses from the bankers provide valuable insights into the specific strategies and initiatives that can drive this process, ensuring that farmers have the financial resources they need to sustain and grow their agricultural activities. This comprehensive approach not only supports individual farmers but also contributes to the broader goal of agricultural development and economic growth in the region. Farooq et al. (2023) and Dong et al. (2012) underscore the importance of financial inclusion in enhancing agricultural productivity by providing access to credit and financial services. Similarly, Omeje et al. (2022) emphasise the critical role of financial services in supporting small-scale farmers, thereby boosting agricultural output. Table 6.1 depicts the various factors impacting the loan advances to farmers.

**Key determinants:**

Based on the interview, the following are the key determinants that could impact the agricultural credit access and advancement;

- **Creditworthiness and Non-Performing Assets (NPAs)**

Improving the creditworthiness of farmers and reducing NPAs are fundamental for increasing loan advances. Ensuring farmers have good credit ratings can significantly impact their eligibility for loans. Regular monitoring and support to improve financial management among farmers can lead to a decrease in NPAs.

- *"Decreasing non-performing assets and improving credit ratings are essential" (B3).*

- **Government Schemes and Subsidies**

Government schemes play a crucial role in supporting farmers and enhancing their access to credit. *"Government schemes like PM Kisan and PM Jandhan Yojana are instrumental in supporting farmers" (B5)*. These schemes provide financial resources, subsidies, and insurance which make it easier for farmers to secure loans and mitigate the risks associated with agricultural activities. As per one response:

- **Physical and Environmental Factors**

The physical conditions of the land, such as terrain, soil fertility, and climate, significantly impact loan disbursement. Areas with favourable conditions are more likely to receive higher loan advances due to the perceived lower risk of crop failure. *"Physical factors like terrain and soil fertility significantly impact credit disbursement" (B4).*

- **Technological Advancements and Farm Mechanization**

Investments in technology, such as modern irrigation systems, high-yield seed varieties, and farm machinery, can improve farm outputs and make farmers more creditworthy. *"Advancing farm mechanization and technical development are vital for boosting productivity and credit eligibility" (B2).*

- **Credit Awareness and Education**

Educating farmers about financial products and services can help them make better financial decisions and improve their creditworthiness. Educational initiatives, such as workshops and training sessions, are crucial for helping farmers understand and manage their finances effectively, thereby improving their ability to obtain and manage loans.

- *"Organizing credit camps in rural areas has increased credit awareness among farmers" (B6). Based on the survey,*
- *"This year's theme is to attract and cater the youth mass regarding financial literacy" (B28).*

- **Market Access and Price Stability**

Ensuring farmers have access to markets and stable prices for their produce are essential for financial stability. Unstable market prices can lead to financial losses, affecting farmers' ability

to repay loans. Providing infrastructure for better market access and implementing price stabilization measures can enhance farmers' financial security.

**Table 6.1** Determinants that impact Loan Advances to Agriculture sector

| Sl. No. | Category | Specific Initiatives | Frequency (%) |
|---|---|---|---|
| **1** | Creditworthiness & NPAs | Improving credit ratings, reducing NPAs, financial management among farmers | 5.7% |
| **2** | Government Support & Subsidies | Government schemes (PM Kisan, PM Jandhan Yojana), subsidies, insurance, low-interest loans | 17.1% |
| **3** | Physical & Environmental Factors | Terrain, soil fertility, climate | 5.7% |
| **4** | Technological Advancements | Modern irrigation systems, high-yield seed varieties, farm machinery, farm mechanization | 8.6% |
| **5** | Credit Awareness & Education | Financial Literacy Camps, workshops, training sessions, awareness campaigns | 14.3% |
| **6** | Market Access & Infrastructure | Market access, price stabilization measures, irrigation systems, storage facilities, transportation networks | 11.4% |
| **7** | Social & Institutional Support | Cooperatives, farmer associations, institutional frameworks, collective bargaining | 8.6% |
| **8** | Crop Insurance | Comprehensive crop insurance, insurance cover for calamities | 11.4% |
| **9** | Prioritizing Specific Crops | Prioritizing rabi crops, high-demand or high-value crops | 5.7% |
| **10** | Offering Multiple Loan Products | LT (for farm equipment), KCC (societies), JLG (landless farmers), SHG (for women producing groups), Animal Husbandry scheme | 8.6% |
| **11** | Financial Inclusion Initiatives | Exploring alternatives to traditional collateral requirements, crop insurance, group guarantees | 8.6% |
| **12** | Youth Engagement | Attracting youth through financial literacy themes | 2.9% |
| **13** | Partnerships & Collaborations | Collaborations with extension agencies, cooperatives, farmer associations for enhanced market linkages | 8.6% |
| **14** | Structural Deficiencies in Credit | High transaction costs, structural deficiencies, credit delivery system issues | 5.7% |
| **15** | Government Mandates | Mandating KCC loan disbursement to all households involved in agriculture | 2.9% |

*Note: The frequency is the rate of responses received for each specific theme*

- **Social and Institutional Support**

The role of social and institutional support cannot be overlooked. Strong cooperatives, farmer associations, and institutional frameworks can provide the necessary backing for farmers to access credit. Such support structures can also help in collective bargaining for better loan terms and conditions. As per the interviews:

- *"Providing loans to farmer producer organizations (FPOs) can mitigate risk by lending to a group, improve bargaining power for agricultural inputs and outputs, and enhance access to markets" (B33).*

- **Organizing Credit Camps**

Organizing credit camps or FLC (Financial Literacy Camps) in rural areas has proven to be an effective strategy for increasing credit awareness among farmers. These camps provide valuable information on available credit options, how to apply for them, and financial management practices.

- *"In many places, loan in stigmatized in general public, which discourages farmers from taking credit" (B5).*
- *"Bank branch offices and agriculture departments need to conduct quarterly or half yearly camps together, financial literacy programs" (B25).*

- **Crop Insurance and Low-Interest Loans**

Providing crop insurance and offering low-interest loans are common strategies to support farmers. These initiatives help mitigate risks associated with farming and make credit more accessible. Insurance schemes protect farmers from the financial impacts of crop failure due to adverse weather or pest attacks.

- *"Availability of comprehensive crop insurance schemes reduces the risk for farmers and increases their creditworthiness and community based banking models where local communities are involved in decision making and accountability for loan repayments and farmers financial literacy" (B22).*

- **Prioritizing Specific Crops**

Prioritizing certain crops can lead to increased loan advances. *"Prioritizing Rabi crops is crucial for increasing agricultural loans" (B1)*. Because most of the farmers are willingly taking credit

for Kharif crop credits, but very few farmers, mostly having their own irrigation sources are taking loans for Rabi crops. Focusing on high-demand or high-value crops can enhance farmers' financial stability and creditworthiness, leading to better loan terms.

- **Offering Multiple Loan Products**

Offering a range of loan products tailored to different types of customers can address the diverse needs of farmers. *"Providing customized loan products that cater to different customer segments are crucial" (B7).* This could include short-term loans for seasonal expenses, long-term loans for infrastructure development, and microloans for small-scale farmers. By diversifying loan products, banks can better meet the specific financial needs of various farmers, enhancing overall credit accessibility. As per one response:

*"Currently, we are providing five kinds of loans: LT (for farm equipment), KCC (societies), JLG (landless farmers), SHG (for women producing groups) and Animal Husbandry scheme" (B17).*

- **Offering Subsidized Loans**

Providing subsidized loans is another crucial strategy for increasing loan advances to agriculture farmers. Subsidized loans can reduce the financial burden on farmers by lowering interest rates and providing more favourable loan terms. *"Offering subsidized loans helps make credit more accessible and affordable for farmers, which is essential for their financial stability and growth" (B8).* These loans can be particularly beneficial in times of financial distress or for financing essential agricultural inputs.

*"For farmers exploring alternatives to traditional collateral requirements, such as crop insurance or group guarantee, to accommodate farmers who lack tangible assets, banks can offer competitive and reasonable interest rates to make loans more affordable for farmers" (B23).*

- **Improving Agricultural Infrastructure**

Enhancing agricultural infrastructure, such as irrigation systems, storage facilities, and transportation networks, is critical. Better infrastructure reduces post-harvest losses and improves productivity, making farmers more capable of repaying loans.

- *"Governments and financial institutions can invest in improving agricultural infrastructure such as irrigation facilities, rural roads, storage facilities, and market linkages. Access to reliable infrastructure can enhance agricultural productivity and*

*profitability, thereby improving farmers' ability to repay loans & Banks can collaborate with agricultural extension agencies, cooperatives, farmer associations, and other stakeholders to reach out to farmers and provide them with financial services." (B31)*

**6.2. Enhancing Support for Agriculture and SMEs (Under priority sector lending)**

Numerous bankers underscored the importance of boosting awareness among farmers regarding available schemes and encouraging crop diversification. They identified a significant gap in knowledge about schemes like the Kisan Credit Card (KCC) and emphasized the necessity of moving from traditional crops like paddy to other more lucrative or sustainable options. Similarly, banks are enhancing financial literacy through training programs and literacy camps for SME owners, often in collaboration with institutions like RBI and NABARD.

- *"The major challenges in the agricultural sector are huge NPAs in the agricultural loan portfolio of the bank. Still, there is an awareness requirement for farmers for KCC. Diversification is required from paddy to non-paddy sectors" (B1).*
- *"Usually, the people involved in the SME sector are not having proper knowledge or awareness regarding how to access credit from the banking system. Hence my bank is conducting several financial literacy camps in collaboration with RBI, NABARD, and many NGOs to create financial awareness among the people" (B26).*

Banks are focusing on providing innovative financial products tailored to the needs of both farmers and SMEs. This includes flexible loan products, integrating crop insurance, and offering customized repayment schedules aligned with the agricultural cycle. Specialized financial products for SMEs include equipment leasing, working capital financing, and trade finance facilities.

- *"Our bank focuses on implementing innovative financial products tailored to farmers' needs, providing financial literacy and training programs, establishing partnerships with agri-input suppliers and commodity buyers, and leveraging technology for efficient loan processing and monitoring" (B28).*
- *"Bank designs specialized financial products for the needs of SMEs, such as loans, working capital financing, equipment leasing, and trade finance facilities. These products often feature flexible terms and conditions suitable to the cash flow dynamics and growth trajectory of SMEs" (B33).*

Technological advancements and digital platforms are being adopted for loan processing and monitoring, streamlining operations, and enhancing efficiency for both agricultural loans and SME credits. Digital disbursement and repayment processes reduce paperwork and make banking services more accessible.

- *"Banks are adopting digital and mobile banking solutions to streamline loan processing and reach a wider pool of SME clients" (B4).*

Banks are offering higher subsidy rates and targeted financial products to encourage the participation of women and marginalized groups in both agriculture and SMEs. This includes support through schemes like PMEGP and customized loan products.

- *"PMEGP scheme offers a subsidy-based loan for the MSME sector, providing 33% for females/SC/ST and 25% for male general category entrepreneurs" (B6).*
- *"Support for small and marginal farmers through SHGs and FPOs is essential to reduce loan default rates" (B5).*

To make credit more accessible, banks are reducing collateral requirements for both agricultural and SME loans. This includes offering collateral-free loans and using alternative data for credit assessment.

- *"Reducing collateral requirements and offering flexible repayment structures are key strategies to support farmers" (B23).*
- *"Our bank is reducing collateral requirements for SME loans by offering collateral-free loans and exploring alternative data for credit assessment" (B23).*

Collaborations between banks, government, and private agencies were suggested as strategies to enhance credit disbursement and support for both sectors. Establishing partnerships with agri-input suppliers, commodity buyers, and local trade associations creates a more integrated support system.

- *"Third parties like government and private agencies could provide equipment through subsidies" (B6).*
- *"Our bank provides networking and mentorship opportunities through collaboration with local trade associations and connecting entrepreneurs with industry experts" (B10).*

A significant challenge highlighted was the farmers' reluctance towards loan renewal and their misconceptions about government loan relief. Similarly, SME owners often lack proper knowledge about accessing credit. Banks are addressing these issues through regular follow-ups and awareness campaigns.

- *"Timely renewal of agriculture loans is not done by farmers and they have an understanding that agriculture loans will be relieved by the government" (B5).*
- *"90% fail to take loan renewal and 70-80% don't wish to take further loans" (B2).*

Banks are offering specialized support programs for both sectors, including interest-free crop loans for farmers and higher subsidies for female entrepreneurs in SMEs. These programs aim to reduce the financial burden and encourage participation in these economic activities.

- *"Interest-free crop loans are also delivered" (B2).*
- *"33% subsidy is provided for females/SC/ST under the PMEGP scheme" (B6).*

### 6.3. Major Initiatives for Increasing Credit Advances

Many banks have implemented extensive credit outreach programs at various administrative levels including district, block, and Gram Panchayat. These programs aim to raise awareness and promote credit to all sectors. For example, one respondent noted,

- *"The major initiatives are conducting credit outreach programs frequently at all district, block, and gram Panchayat levels for awareness and pushing credit to all sectors" (B2).*
- *Another banker added, "Conducting extensive customer outreach programs, including seminars, workshops, and awareness campaigns, to educate our clients about various loan options and their benefits" (B6).*

Banks have actively participated in government schemes such as PM Kisan, PM Jandhan Yojana, PM Jeevan Bima Yojana, and Kisan Credit Card (KCC) which offer subsidized interest rates to promote agricultural loans. One banker highlighted,

- *"Schemes like PM Kisan, PM Jandhan Yojana, and PM Jeevan Bima Yojana have been pivotal in our credit advances" (B3).*
- *Another mentioned, "Introduction of zero interest rate up to ₹1 lakh of agriculture loan (KCC) and 2% interest on ₹1 lakh to ₹3 lakhs of KCC loans" (B18).*

Banks are focusing on evaluating customers and market conditions, enhancing customer service culture, and continuously evaluating their product offerings to meet customer needs. A respondent shared,

- *"We emphasize evaluating customers and market conditions, building a strong customer service culture, and enhancing our product offerings through technology" (B4).*
- *Another added, "We have implemented measures to streamline loan approval processes, leveraging technology to reduce processing time and enhance efficiency" (B8).*

Financial literacy programs and awareness campaigns have been conducted to educate clients about various loan options and their benefits. These include seminars, workshops, and other outreach programs. For instance, one banker noted,

- *"Financial literacy programs targeting different demographics to educate them about credit options and responsible borrowing practices" (B26).*
- *Another stated, "Financial awareness camps conducted in conjunction with NABARD to improve financial literacy among rural populations" (B17).*

The implementation of technology to streamline loan approval processes, reduce processing time, and enhance operational efficiency has been a key initiative. This includes digital transformation and collaborations with fintech companies. One banker mentioned,

- *"Enhancing customer service through digital channels and participating in government-led credit guarantee schemes" (B28).*
- *Another added, "Going digital, offering new loan options, managing risks better partnering with insurance and offering flexible repayment options, working with governments, NGOs, and fintech companies to reach wider audiences and potential borrowers" (B24).*

Introduction of new loan products tailored for agricultural, MSME, housing, and personal loans have been a significant strategy. This is coupled with participation in government schemes like PMAY and MUDRA loans. A respondent highlighted,

- *"Introduction of new loan products: Agricultural, MSME, housing, and personal loans. Actively collaborated with government schemes like PMAY and MUDRA loans" (B7).*

Several banks have adopted a door-to-door approach to create awareness among potential borrowers, particularly in rural and semi-urban areas. One banker noted,

- *"We conduct door-to-door awareness campaigns to educate farmers and small entrepreneurs about financial options available to them" (B17).*
- *Another shared, "Our participation in credit guarantee schemes provided by governments or third-party institutions has mitigated the risk of lending to farmers and agricultural enterprises" (B31).*

Rural banks have developed specialized loan products for farmers and agricultural businesses. One banker stated,

- *"Rural banks offer specialized loan products designed for farmers and agricultural businesses, such as crop loans, livestock loans, farm equipment financing, and agri-input loans" (B30).*

Banks have partnered with organizations like NABARD to conduct financial literacy camps and other initiatives aimed at improving credit access and financial literacy. A respondent mentioned,

- *"Several credit-related camps have been organized in rural, semi-urban, urban, and other areas of our community to reach out to credit-needy people" (B27).*

Adopting digital solutions to improve customer experience and operational efficiency has been a common strategy among banks. One banker noted,

- *"Enhancing customer service through digital channels and participating in government-led credit guarantee schemes" (B28).*
- *Another added, "We have streamlined our loan approval processes to reduce waiting times and improve efficiency" (B8).*

| **Theme** | **Frequency** | **Percentage** |
|---|---|---|
| Government Schemes and Support | 18 | 20.69% |
| Financial Literacy and Awareness | 11 | 12.64% |
| Customized and Flexible Loans | 9 | 10.34% |
| Digitalization and Technology | 6 | 6.90% |
| Outreach Programs and Camps | 11 | 12.64% |
| Risk Mitigation | 5 | 5.75% |
| Customer Service and | 6 | 6.90% |

| Engagement |
|---|

*Note: The frequency is the rate of responses received for each specific theme*

### 6.4. Prospects and Difficulties in Availing Agricultural and SME Loans during Pre-COVID, COVID, and Post-COVID Scenarios

- **Pre-COVID**

Both the agricultural and SME sectors showed consistent demand for loans. The agricultural sector benefited from regular farming activities and aggressive government-backed schemes, while SMEs saw steady growth with increasing demand for capital for expansion, inventory management, and technology upgrades.

- *"Strong demand for agricultural loans due to regular farming and government schemes generated demand for loans." (B2 B4)*
- *"Pre-COVID growing economy leading to increased demand for capital among SMEs." (B15)*

Challenges included high rejection rates due to lack of KYC and creditworthiness for agricultural loans, and high-interest rates and limited access to credit for SMEs. Both sectors faced limited access to formal banking services and regulatory hurdles.

- *"Limited loan accessibility and restricted to farmers with large land holdings." (B19)*
- *"Limited access to credit and regulatory hurdles." (B28)*
- *"Strict requirements and complex applications limited access for smaller players." (B23)*

- **COVID**

The pandemic led to significant economic disruptions for both sectors, including supply chain issues, labour shortages, and income uncertainties. Government stimulus packages increased agricultural advances, while interest rate subsidies provided some relief for SMEs.

- *"Govt. stimulus packages increased agricultural advances but economic uncertainty remained." (B2)*
- *"Interest rate subsidy quite helped the SME sector during COVID." (B15)*

Both sectors experienced increased NPAs due to difficulties in loan repayment. Farmers faced severe disruptions in their income streams, while SMEs struggled with cash flow problems and disrupted operations.

- *"Loan repayment was not done after COVID period; increased NPAs due to economic uncertainties." (B1 B3)*
- *"Giving loan to SMEs is a risky factor because of uncertainties about their growth and future repayment." (B21)*

Lockdown measures disrupted supply chains, affecting the availability of agricultural inputs and impacting farming activities. SMEs faced significant operational challenges, struggling to maintain business activities and meet loan obligations.

- *"Supply chain disruption affected farmers' ability to repay loans leading to higher default rates." (B15)*
- *"Supply chain disruption affected the SME sector very much." (B15)*
- *"During COVID disruptions in supply chains labour shortages and income uncertainties were major obstacles." (B28)*

Despite challenges, both sectors received support through relief packages and initiatives from banks and government bodies.

- *"No doubt SME sector faced lots of difficulties during COVID but in post-COVID scenarios banks and government initiated every possible step to resolve the issue." (B1)*

**Post-COVID**

Post-COVID, both sectors began to stabilise with improved loan disbursement and government support. SMEs adapted to new market dynamics and accessed affordable financing, while the agricultural sector benefited from various government initiatives.

- *"Post-COVID conditions are better for recovery of loans than pre-COVID but market fluctuations remain a challenge." (B10 B28)*
- *"Central government supported a lot during COVID and post-COVID times. Banks have given COVID loans to affected customers." (B24)*
- *"Post-COVID the number of SMEs has multiplied; however caution was followed in loan disbursement." (B19)*

The pandemic accelerated the adoption of digital banking in sectors, improving accessibility and efficiency in loan processing. This shift led to increased usage of cashless transactions, streamlining banking operations and customer interactions.

- *"After COVID the use of cashless transactions increased." (B6 B13)*
- *"Digital transformation has improved loan processing efficiency and customer interactions." (B6 B13)*

Both sectors continued to face challenges due to lingering economic impacts, fluctuating market conditions, and regulatory requirements. These include impacts of global conflicts and economic uncertainties, and the need for SMEs to adapt to changing market conditions and maintain profitability.

- *"Lingering economic impacts like Gulf Palestine war Russia war etc. fluctuate prices." (B2)*
- *"Long-term sustenance of SMEs is a challenge due to conflicts and poor entrepreneur skills." (B4)*

| Theme | Frequency (Agri Loans) | Frequency (SME Loans) |
|---|---|---|
| Loan Repayment Issues | 7 | 5 |
| Supply Chain Disruptions | 4 | 4 |
| Government Support | 4 | 3 |
| Economic Uncertainties | 4 | 3 |
| Loan Demand | 5 | 4 |
| Increased NPAs | 3 | 3 |
| Digital Transactions | 2 | 2 |

*Note: The frequency is the rate of responses received for each specific theme*

### 6.5. Political Pressure and Government Interventions in Credit Disbursement Initiatives

The responses from the surveyed bankers indicate a diverse range of experiences regarding political pressure and government interventions in credit disbursement initiatives, particularly in the sectors of agriculture and SMEs (Small and Medium Enterprises). The feedback reveals a mixture of supportive government actions, minimal political interference, and challenges related to implementation and transparency.

A significant number of bankers reported low levels of political pressure, highlighting a general encouragement from the government for different credit schemes. For instance, specific initiatives such as the Balram scheme, fishery scheme, and dairy scale were mentioned as being encouraged by the government.

- *"Low level of pressure. Government encourages for different schemes like the Balram scheme, fishery scheme, and dairy scale." (B1)*

This sentiment is echoed by multiple respondents who emphasized the proactive role of the government in ensuring transparency and smooth disbursement processes.

- *"Govt. is proactive and ensures transparency in loan disbursement. The Hon'ble govt of Odisha has implemented 5T for smooth credit disbursement and the SAFAL portal for farmers." (B3)*

Several bankers indicated an absence of political interference in their credit disbursement processes. They noted that their operations are primarily guided by regulatory frameworks and institutional policies without external pressures.

- *"No, there is no pressure. But it is the duty of bankers to create livelihood activities through small development and credit linkage." (B2)*
- *"No political pressure or govt. intervention." (B6)*

Some respondents highlighted the supportive nature of government interventions, which are primarily aimed at promoting priority sector lending and ensuring that credit reaches the intended beneficiaries.

- *"Govt. motivates the priority sector lending. Even though there are some interventions, the cooperative banks check the documents thoroughly before sanctioning any credits." (B14)*

While many reported minimal interference, a few bankers did mention localized political pressure, particularly in issuing loans to large farmers. However, central schemes were noted to promote transparency despite these challenges.

- *"Local political pressure to issue loans to large farmers persists. Central schemes are promoting transparency." (B4)*

The introduction of various government portals and schemes aimed at transparency and efficiency in credit disbursement was noted positively. These initiatives are seen as mechanisms to reduce bureaucratic delays and improve the distribution of credit.

- *"The government has implemented several measures to ensure transparency in the loan disbursement process, such as the SAFAL portal for farmers." (B3)*

From the data, it is clear that while some bankers reported direct numerical impacts, the overall impression was qualitative. For example, one respondent from a major bank mentioned their vast customer base, highlighting the scale at which they operate under government schemes.

- *"Immense. SBI is the go-to bank for every govt initiative because we have the largest customer base of 49 crores." (B19)*

| Theme | Frequency | Percentage |
|---|---|---|
| No Political Pressure or Government Intervention | 15 | 50.00% |
| Government Encouragement and Support | 6 | 20.00% |
| Transparency and Proactive Government | 5 | 16.67% |
| Local Political Pressure | 2 | 6.67% |
| Implementation Delays | 1 | 3.33% |
| Support for Agriculture and SME Sectors | 2 | 6.67% |

*Note: The frequency is the rate of responses received for each specific theme*

### 6.6. Suggestion by bankers towards improved designing, implementation, and evaluation Credit

A significant number of bankers emphasised the importance of creating awareness at the grassroots level and improving financial literacy among farmers. This can be achieved through various training programs and educational initiatives focusing on financial management, loan processes, and the benefits of credit. Many farmers are hesitant to take loans due to a lack of understanding and fear of debt burdens. Increasing awareness can help alleviate these concerns and encourage more farmers to utilize credit effectively.

- *"Government training should be provided to consumers on various aspects. The awareness should be created, the infrastructure and facilities should be provided." (B6)*
- *"Farmers should know what is the right time for deposit and repayment of money. A lot of farmers are still not taking loans because they are afraid it might be a burden for them and their family." (B11)*

Leveraging technology to improve credit flow was another common suggestion. This includes the use of fintech services, digital banking, and robust credit assessment criteria to ensure effective loan disbursement and monitoring. Technology can streamline loan processes, making

them more efficient and accessible, especially in remote areas where traditional banking infrastructure is lacking. Fintech solutions can provide innovative ways to assess creditworthiness and manage risk.

- *"Leveraging technology and awareness of fintech services in remote areas can significantly enhance financial inclusion." (B2)*
- *"Leverage technology and data to improve credit flow and offer tailored loan products." (B23)*

Bankers suggested that collaboration with government agencies and NGOs is crucial for promoting financial inclusion and ensuring the effective implementation of credit schemes. This partnership can help in providing necessary support and resources to farmers and other beneficiaries. Such collaborations can also facilitate the development of infrastructure and delivery of financial literacy programs, thereby enhancing the overall credit ecosystem.

- *"Collaborating with government and NGOs to promote financial inclusion is essential for a successful credit flow." (B2)*
- *"Collaboration with local government bodies, community leaders, and customers is essential for successful credit flow." (B18)*

Regular monitoring and risk management practices are essential to minimize the risk of non-performing assets (NPAs) and ensure timely repayment of loans. This includes clear credit terms, regular follow-ups, and robust collection strategies. Effective risk management helps in maintaining the financial health of both the lenders and the borrowers, fostering a sustainable credit environment.

- *"Assessment of creditworthiness, clear credit terms and conditions, and continuous review and improvement are crucial for effective credit flow management." (B3)*
- *"Strengthen risk management practices and monitor loan portfolios regularly to ensure effective credit flow." (B2)*

Customized financial products and services that cater to the specific needs of the local population can significantly enhance credit flow. This includes flexible loan tenures, relaxed collateral requirements, and tailored loan products based on the borrowers' cash flow cycles. By addressing the unique financial needs of different sectors, banks can provide more relevant and accessible credit solutions.

- *"Offer flexible and customized repayment structures, aligning with the cash flow cycles of borrowers to reduce financial stress." (B31)*
- *"Providing training and technical assistance to farmers to improve financial literacy, access to market, and business skills for better utilization of credit and enhance productivity." (B15)*

Regular field visits and direct engagement with farmers can provide better insights into their financial needs and challenges, enabling more effective credit disbursement and support. These interactions help bankers understand the ground realities and tailor their services accordingly. However, the lack of adequate staffing in some branches hampers the ability to conduct these visits regularly.

- *"If banks can do regular field visits, it will be much better to be updated with farmer situations. But that is not happening because of less staff appointed in a branch." (B8)*
- *"More empowerment to farmers for financial services will be beneficial." (B9)*

Promoting financial literacy and providing training programs can enhance farmers' understanding of financial products and improve their financial management skills. This is crucial for fostering entrepreneurship and ensuring sustainable economic growth. Such programs can cover various aspects, including credit utilization, market access, and business skills, helping farmers make informed decisions.

- *"Providing training and technical assistance to farmers to improve financial literacy, access to market, and business skills for better utilization of credit and enhance productivity." (B15)*
- *"Financial Literacy and KYC are fundamental to ensure that farmers can access and effectively use credit products." (B4)*

Developing a robust regulatory framework that encourages responsible lending practices while ensuring consumer protection is essential for the sustainable growth of the credit sector in East India. Such policies should focus on reducing bureaucratic hurdles, promoting transparency, and ensuring that credit is accessible to all segments of the population, particularly the underserved.

- *"Policy Framework: Develop a robust regulatory framework that encourages responsible lending practices while ensuring consumer protection." (B34)*

- *"Conduct a detailed analysis of the agriculture and SME sectors to address the region's unique challenges." (B15)*

| Theme | Frequency | Percentage |
|---|---|---|
| Financial Literacy and Awareness | 15 | 22.39% |
| Collaboration of Government and NGO | 9 | 13.43% |
| Technology and Digitalization | 9 | 13.43% |
| Credit Assessment and Risk Management | 7 | 10.45% |
| Customized and Flexible Loans | 9 | 13.43% |
| Infrastructure Development | 7 | 10.45% |

*Note: The frequency is the rate of responses received for each specific theme*

**Table 6.2** Code of bankers surveyed

| Code | Bank Name | Designation |
|---|---|---|
| **B1** | Odisha Gramya Bank (OGB) | Branch Manager |
| **B2** | Bank of India | LDM |
| **B3** | Co-operative Bank | Branch Manager |
| **B4** | Co-operative Bank | Branch Manager |
| **B5** | Co-operative Bank | Assistant Manager |
| **B6** | Odisha Gramya Bank (OGB) | Branch Manager |
| **B7** | Odisha Gramya Bank (OGB) | Branch Manager |
| **B8** | Co-operative Bank | Branch Manager |
| **B9** | SBI | Branch Manager |
| **B10** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B11** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B12** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B13** | SBI | Chief Manager, Lead Bank |
| **B14** | Co-operative Bank | Branch Manager |
| **B15** | Bank Of India | Clerk |
| **B16** | Odisha Gramya Bank (OGB) | Branch Manager |
| **B17** | Co-operative Bank | Branch Manager |
| **B18** | Co-operative Bank | Manager |
| **B19** | SBI | Probationary Officer |
| **B20** | Odisha Gramya Bank (OGB) | Branch Manager |
| **B21** | SBI (Agriculture) | Deputy Manager |
| **B22** | SBI | Branch Manager |
| **B23** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B24** | BOI | Branch Manager |
| **B25** | Indian Bank | Manager |
| **B26** | Utkal Grameen Bank (UGB) | Field Officer |

| | | |
|---|---|---|
| **B27** | Union Bank of India | LDM |
| **B28** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B29** | Utkal Grameen Bank (UGB) | Branch Manager |
| **B30** | Co-operative Bank | Manager |
| **B31** | State Bank Of India | Manager |
| **B32** | Co-operative Bank | Assistant Manager |
| **B33** | State Bank Of India | Probationary Officer |
| **B34** | Utkal Grameen Bank (UGB) | Asst Manager |
| **B35** | Co-operative Bank | Branch Manager |

**Table 6.3 Profile of Respondents**

| Gender | Frequency | Percentage (%) |
|---|---|---|
| **Male** | 26 | 74.28 |
| **Female** | 9 | 25.72 |
| **Age groups of Respondents (in years)** | | |
| **Above 41 years** | 8 | 22.86 |
| **30-40 years** | 20 | 57.14 |
| **Up to 30 years** | 7 | 20 |
| **Education Qualification of Respondents** | | |
| **Graduate** | 27 | 77.14 |
| **Post Graduate** | 8 | 22.86 |
| **Experience of Respondents** | | |
| **Above 15 years** | 5 | 14.29 |
| **10-15 years** | 7 | 20 |
| **5-10 years** | 9 | 25.71 |
| **0-5 years** | 14 | 40 |
| **Designation of Respondents** | | |
| **Senior Manager** | 4 | 11.43 |
| **Branch Manager** | 20 | 57.14 |
| **Manager** | 6 | 17.14 |
| **Assistant Manager** | 5 | 14.29 |

(Senior Manager includes LDM, Deputy Manager & Manager includes PO, Field Officers)

# Chapter 7 – Conclusion, Policy Implications and Recommendation

This chapter is focussed on giving recommendations for policymakers based on the study's findings and interview with the bankers. The recommendations are bifurcated into credit and non-credit related, in which the credit related recommendations are given based on the inputs of both supply side (bankers) and demand side (farmers) parties to credit. Further, this chapter concludes the overall study.

## 7.1 Key Findings and recommendations

There are several key issues that policy makers need to be worked on at ground level to improve credit access in the ten districts of Odisha. The same can be further expanded to East India. As the study's findings revealed, the key issues that the farmers face in accessing credit is there lack of knowledge or awareness about the various financial products and lack of education in processing the loan. Considering this, policymakers need to promote financial literacy and providing training programs to enhance farmers' understanding of financial products and improve their financial management skills. Such programs can cover various aspects, including credit utilization, market access, and business skills, helping farmers make informed decisions. It can be undertaken in gram Panchayat level which is more accessible and trustable for farmers. Further the frequent conduct of programmes like Kristi Mela would also be helpful in promoting credit awareness in farmers.

Further, as the credit requirements of farmers depend upon their agricultural product and its tenure, greater flexibility is needed in financial products for farmers. Customised financial products and services that cater to the specific needs of the local population can significantly enhance credit flow. This includes flexible loan tenures, relaxed collateral requirements, and tailored loan products based on the borrowers' cash flow cycles. This is especially required for marginal farmers as they are deprived of the collaterals and are less accessible to higher loan amounts. By addressing the unique financial needs of farmers, banks can provide more relevant and accessible credit solutions.

There are several misconceptions and malpractices by farmers in rural areas due to their lack of awareness. Regular field visits and direct engagement with farmers can provide better insights

into their financial needs and challenges, enabling more effective credit disbursement and support. These interactions help bankers understand the ground realities and tailor their services accordingly. However, the lack of adequate staffing in some branches hampers the ability to conduct these visits regularly, which needs to be taken care. The increased engagement could also be ensured through increase in bank correspondents, as many farmers found it difficult to go to the banks due to lack of connectivity issues.

Finally, as noticed, rural farmers need external support of those who are educated, with better technology expertise and who could act as a guide. NGOs could act as a mediator in this end as they could better understand the issues of farmers. Hence, collaboration of government agencies and NGOs is crucial for promoting financial inclusion and ensuring the effective implementation of credit schemes. This partnership can help in providing necessary support and resources to farmers and other beneficiaries. Such collaborations can also facilitate the development of infrastructure and delivery of financial literacy programs, thereby enhancing the overall credit ecosystem. The overall framework to the formal agricultural credit access is given in Figure 7.1.

### 7.1.1. Credit related

**Supply side**

- *Incompetence of DBT (Direct Benefit Transfer):* The disbursement of Direct Benefit Transfer to farmers through initiatives like the PM Kisan and Kalia Yojana remains incomplete, leaving a segment of farmers deprived of these crucial benefits. For instance, in Sambalpur District, farmers in the urban area noted that as their area is under the purview of municipality, they do not receive the benefits of the DBT schemes of state and central government. – ***More inclusivity is required in incorporating different level of farmers to DBT scheme***
- *High Interest after due period*: Zero per cent interest is charged to farmers for up to one acre and beyond that 2% interest is charged. However, even one-day failure gathers interest to 13% which is quite high. In such a scenario, farmers are reluctant to take further loans considering the volatility of the sector. – ***Loan moratorium period could be increased for marginal farmers.***
- *Indifference towards Private Banks*: Private banks, with their exorbitant interest rates and stringent collateral and guarantor requirements, dissuade farmers from seeking loans. The

obligation of monthly interest payments clashes with farmers' earnings, primarily garnered during two cropping seasons, potentially casting them as defaulters and subjecting them to public scrutiny. – ***Private banks could be more proactive in disbursement of loans to marginal farmers***

- *Absence of Bank Correspondents:* Despite the proximity of banks to villages, typically within a radius of 10 to 15 kilometres, farmers lament the dearth of visits by bank correspondents to their locales. This limits their awareness towards understanding financial principles and creates a dent in availing new schemes and loans. – ***Increase the enrolment of bank correspondents to the tribal districts.***
- *Bureaucratic Hurdles:* Some farmers cite bureaucratic hurdles, such as the requisite paperwork for land registration, as deterrents to loan acquisition. The prescribed loan limits by cooperative societies often fall short of meeting farmers' needs for agricultural commercialisation, underscoring the necessity for an expanded loan bandwidth. **– *The KYC process could be made easier for marginal farmers.***
- *Cumbersome Bank Procedure:* Farmers face challenges with banking procedures, including delays, harassment, and eligibility issues, motivating them to avoid formal banking routes.- ***The local bank branches should be more inclusive and accessible to the marginal farmers. With a greater collaboration with government agencies and NGOs, policymakers could make sure the help of NGOs for farmers in educating and accessing the agricultural credit.***
- *Complex KCC Process:* In Keonjhar, Koraput and Malkangiri, documentation complications related to joint land holdings pose hurdles to Know Your Customer (KYC) processes and impede the issuance of Kisan Credit Cards. **– *Policy makers should consider relaxing the norms of KCC process***
- *Minimum Balance in Account*: In Sundergarh and Mayurbhanj district, banks require a minimum balance to grant loans and being small and marginal farmers, they do not meet the criteria.- ***Banks could consider relaxing norms of minimum balance in case to case basis, especially for marginal farmers.***
- *Delayed Loan Disbursement:* Banks delay in loan disbursement to small and marginal farmers sighting various reasons. In Mayurbhanj, Sundergarh, Gajapati, Balasore, Nawarangpur, Malkangiri and Keonjhar banks have given further dates to farmers for loan

approval which made them loose interest in the process. Some farmers in the Koraput district face delays in loan disbursements. For farmers, it takes more than a week sometimes or more than a month to get their required amount of loan which affect the harvesting period***.- Disbursement of loans can be accelerated in case to case basis.***

- *Incompetence of Bank:* In Mayurbhanj, Farmers mentioned that at times, banks do not have enough cash. For example, if they went to withdraw an amount of Rs. 30,000/- they are given only Rs. 10,000. Bank officials ask them to revisit due to unavailability of adequate cash. In such cases, they must take a day off and visit again. This process becomes cumbersome for the farmers and discourages their visits to banks.
- *Single Disbursement of Loan:* In Kalahandi, farmers express a preference for receiving credit amounts in a single disbursement instead of multiple installments.
- *Distance of Cooperative Societies:* Most of the farmers in the Koraput district are dependent on cooperative societies for their loan requirements and in most of the places there is the unavailability of LAMPS or PACS office, so people must travel to the city centre to avail loans.
- *Credit History:* In Nawarangpur and Mayurbhanj, limited or no credit history for many farmers makes it difficult for financial institutions to assess their creditworthiness, leading to loan rejections.

**Demand side**

- *Constraints of Group Lending:* While group lending mechanisms have garnered favour among farmers, inherent risks loom, as a single member's irresponsibility can imperil the financial standing of the entire group. Moreover, unanimity on loan amounts may not always be attainable.
- *Uneven Land Pattern*: Farmers face challenges in accessing credit due to complexities associated with land ownership, particularly concerning ancestral land registrations. This hinders their access to credit through KCC, because it requires land records as a mandatory criterion for granting loans.
- *Lack of Financial Awareness*: Lack of financial literacy leads to uncertainty regarding the reasons for Direct Benefit Transfer amounts deposited into their accounts. Farmers are quite unaware regarding the loan benefit schemes of different banks. They lack a significant

understanding of the scheme and know it by certain other terms. There is asymmetrical information transfusing into the rural areas. - ***Increasing financial literacy through various programmes undertaken at gram Panchayat level and through increasing the frequency of Kristi Melas.***

- *Apprehension towards higher value loans:* Farmers are apprehensive to take loans of higher value because of high-interest rates and uncertainty in production would lead to failure of loan repayment. The volatility of the sector would forbid them to invest more as profit margin is affected due to several factors.
- *SHG Loans:* In Mayurbhanj, Keonjhar and Sambalpur, male farmers draw loans through their female counterparts from the SHG loan facility as it provides less interest than the banks and does not require collateral. However, the loan amount is low and do not suffice the needs for commercial farming.
- *Credit Requirement Cycle:* In Keonjhar and Sambalpur, the seasonal nature of agriculture, necessitates credit disbursement at critical junctures like planting and harvesting seasons, traditional financial institutions however do not offer the requisite flexibility for farmers' exigencies.- ***Flexibility in disbursement of loans in case to case basis.***
- *Infrastructure:* Inadequate infrastructure, such as rural roads and connectivity, hinder the delivery of credit to remote agricultural areas. Farmers reflect a tendency of avoidance to visit banks. Additionally, limited technological adoption in rural banking impedes the efficiency of credit delivery processes.

### 7.1.2. Non-credit

- *Irrigation:* Irrigation remains a significant challenge across numerous districts, severely impacting agricultural production. While the rainy season aids in the growth of Kharif crops, the absence of adequate irrigation facilities detrimentally affects Rabi crop cultivation. Issues such as water scarcity, dependence on rainfall, and limited irrigation infrastructure have profoundly affected farmers' livelihoods. Inadequate rainfall and limited access to irrigation lead to crop destruction, resulting in diminished income and hindering farmers' ability to secure loans.

- *Soil:* In Malkangiri district, farmers encounter substantial issues stemming from poor soil quality. The alkaline nature of the soil poses a significant obstacle to agricultural productivity, impeding crop growth and yield.
- *Lack of Training facility*: Farmers in interior areas of the sampled districts lack access to essential training on fertilizer and pesticide usage. Moreover, training related to farm equipment, such as threshers and power tillers, is crucial in reducing labour costs and maximizing production. Addressing this gap in training could empower farmers to enhance their agricultural practices, leading to increased loan advancements and investments in subsequent years.
- *Storage Facility:* The primary challenges faced by farmers include intermittent irrigation during critical agricultural seasons and inadequate storage infrastructure. This shortage of storage facilities particularly affects the profitability of Rabi crops, forcing farmers to sell their produce at suboptimal prices. As a result, farmers are deprived of potential profits, thereby impacting overall profitability.
- *Outdated Farming Practice:* Districts like Nawarangpur, Malkangiri, and Koraput are characterized by out-dated farming techniques and minimal utilization of modern agricultural equipment. This out-dated approach leads to low yields and discourages farmers from commercializing their agricultural activities.
- *Small Land Holdings*: Farmers grapple with the challenge of owning small and fragmented land holdings, which hinders their ability to benefit from economies of scale and adopt modern agricultural practices. This constraint limits their capacity to invest in agricultural advancements and maximize productivity.
- *Disbursement of Subsidy*: Farmers across numerous districts frequently lament the protracted process of subsidy allocation, which adversely impacts crop cultivation and financial viability. The tardiness in acquiring high-yielding variety (HYV) seeds, fertilizers, and pesticides engenders detrimental repercussions, as farmers are unable to timely administer essential nutrients to their crops. Consequently, this delay precipitates a cascade of adversities, impeding crop growth and diminishing income prospects. To note, the ‘Kind’ component under the loan scheme is delayed most of the time. The government fails to provide timely fertilisers at subsidized rates. This leads farmers to buy fertilisers at higher prices from the market. Moreover, the deferred subsidy distribution exacerbates the

challenges associated with loan advancement, as farmers struggle to meet repayment obligations due to compromised agricultural yields.

- *Social Stigma*: Farmers confront a pervasive social stigma surrounding loan procurement, which engenders reluctance and apprehension. The prevailing societal perceptions regarding indebtedness perpetuate a culture of scepticism and apprehension, dissuading farmers from availing themselves of financial assistance. The fear of social ostracism and communal disapproval looms large, compelling farmers to forego vital financial resources essential for agricultural sustenance. Consequently, this entrenched social stigma not only impedes access to credit but also exacerbates financial insecurities, exacerbating the cycle of poverty and disenfranchisement.
- *Government ceiling of purchase quotas*: Government purchase quotas for paddy do not align with actual yields, compelling farmers to sell surplus produce at lower prices to private players, highlighting the need for increased government purchase quotas.
- *Crop Failure:* Crop failures stemming from adverse conditions such as drought, disease and invasion of wild animals exacerbate farmers' struggles to repay loans, precipitating a cycle of indebtedness and financial turmoil. In Champua block of Keonjhar district, farmers sight their plight against the invasion of elephants and inability to claim of crop insurance through PMFBY scheme. This situation adversely affects their income and creates a suspension to invest in agriculture in the future.

### 7.2 Conclusion

In conclusion, agriculture in India, particularly in the state of Odisha, remains a vital sector deeply embedded in the nation's socio-economic fabric. Odisha's agricultural landscape is marked by its heavy reliance on rain-fed paddy cultivation, which dominates the net sown area. Despite efforts to diversify through horticulture and floriculture, productivity levels in Odisha generally lag behind the national average. The study, using an ordered probit model with sample selection, ANOVA and chi-square test, identified several determinants and constraints affecting agricultural credit access among farmers. Key findings reveal that over 80% of farmers in Odisha are marginal or small, with the majority relying solely on agriculture for income. Credit availability varies significantly across districts, with education levels playing a critical role in

credit access. For instance, in Nabrangpur, low education levels among farmers correspond to higher credit constraints.

Gender disparities and social composition significantly influence income levels and credit access in Odisha. Districts with higher proportions of women farmers, such as Mayurbhanj, experience lower income levels, whereas districts with a greater representation of male farmers, like Kalahandi, report higher income levels. The study also highlights the impact of caste, with non-SC/ST farmers in districts like Balasore achieving higher income and better credit access. Key factors facilitating credit decisions include education, engagement in agricultural activities, such as participation in Krishi Mela and the benefits of the Kisan Credit Card scheme, income, resource availability and diverse credit options. Conversely, factors such as distance to financial institutions, high-interest rate perceptions, socio-economic challenges, and family size negatively impact credit access. Further, the major constraints faced by farmers were high interest rates, group lending issues, mortgage requirements and non-receipt of applied amount. These findings underscore the need for targeted interventions to address the diverse constraints faced by farmers, emphasising the importance of district-specific strategies and the enhancement of educational opportunities to improve agricultural credit access and overall productivity in Odisha.

The roles of financial institutions are vital in implementing the government schemes in supporting farmers and enhancing their access to credit. These schemes provide financial resources, subsidies, and insurance which make it easier for farmers to secure loans and mitigate the risks associated with agricultural activities. Further, the financial institutions play a crucial role in enhancing financial literacy by educating farmers about financial products and services which can help them make better financial decisions and improve their creditworthiness. Educational initiatives, such as workshops and training sessions, are crucial for helping farmers understand and manage their finances effectively, thereby improving their ability to obtain and manage loans. Finally, it is imperative for financial institutions to enhance the agricultural infrastructure with the support of government by dispersing more credit which would solve non-credit constraints such as irrigation systems, storage facilities, and transportation networks. Better infrastructure reduces post-harvest losses and improves productivity, making farmers more capable of repaying loans. The overall finding of the study is provided in Figure 7.2.

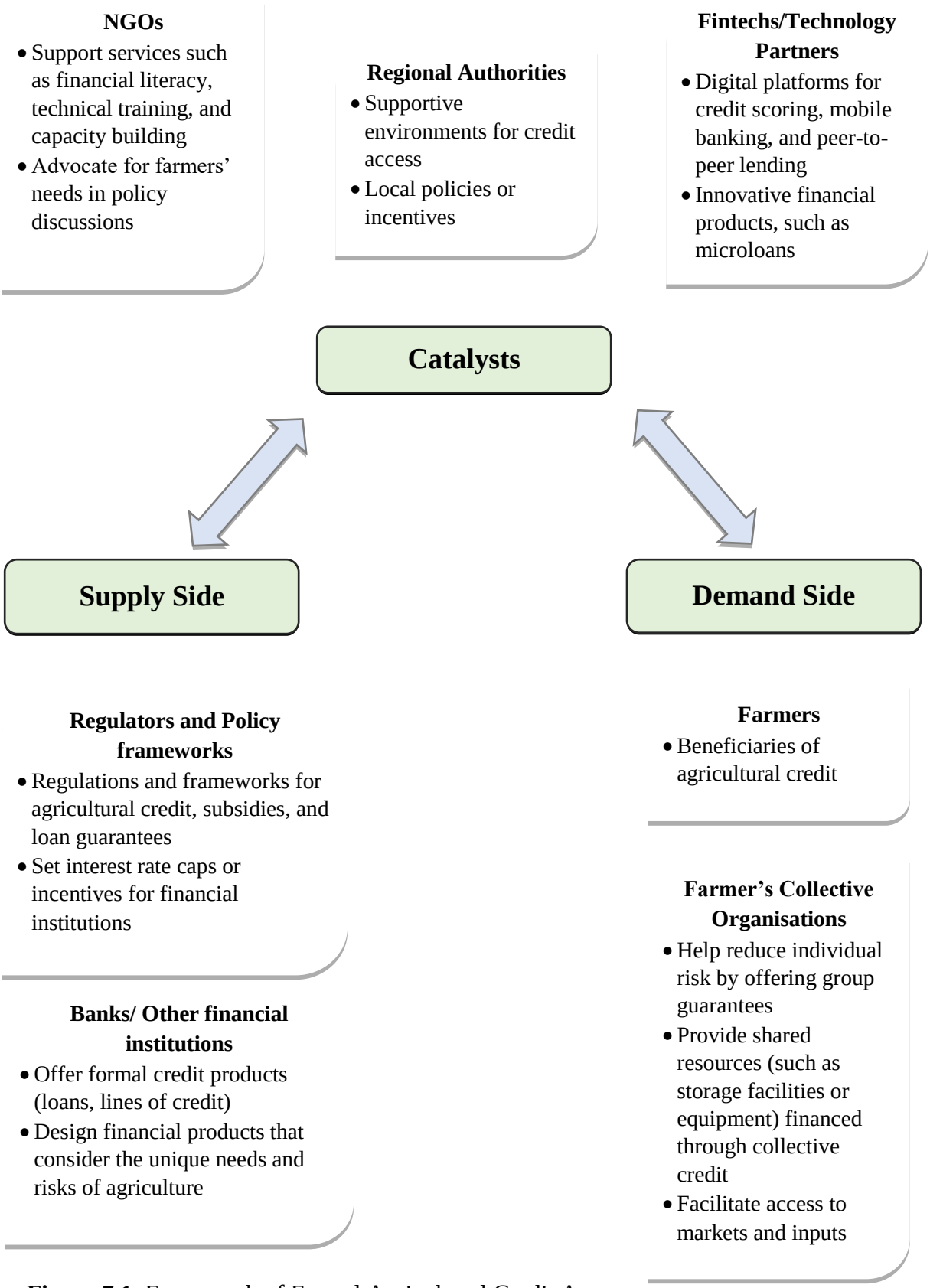



**Figure 7.1**. Framework of Formal Agricultural Credit Access

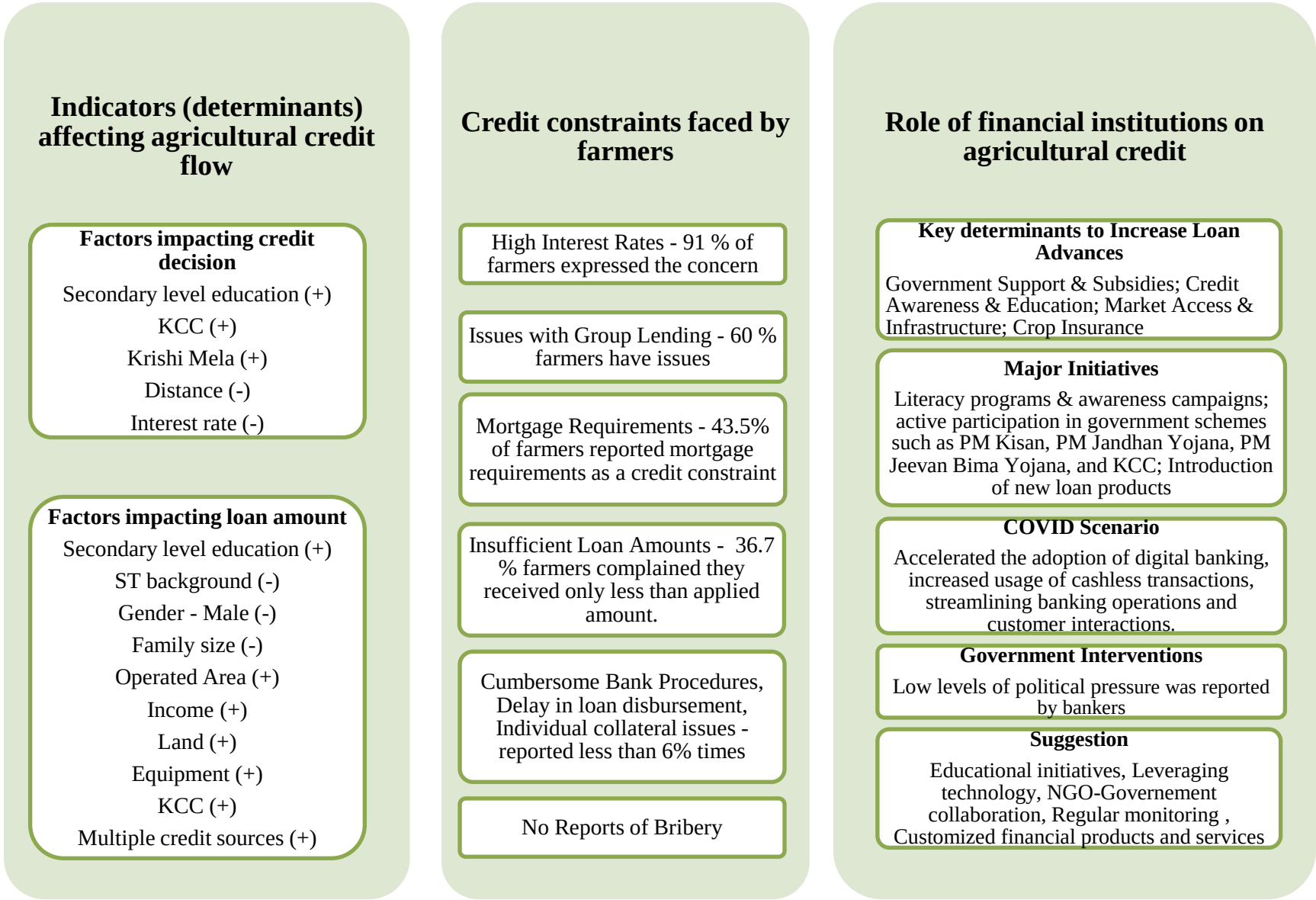



**Figure 7.2.** Overall findings of the study

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## Annexure A – Interview questions for bankers

| Clubbed Heading | Original Questions |
|---|---|
| 1. Determinants to Increase Loan Advances to Agriculture Farmers | **Q1:** What are the determinants to increase loan advances to agriculture farmers in East India? |
| 2. Enhancing Support for Agriculture and SMEs (Under priority sector lending) | **Q2:** There are numerous challenges in agriculture sectors, so how can your bank overcome this problem to increase the credit disbursement to the farmers?<br><br>**Q3:** What are the efforts your bank is putting up to support credit disbursement in SMEs sector and encouraging entrepreneurship? |
| 3. Major Initiatives for Increasing Credit Advances | **Q4:** What are the major initiatives to increase the credit advances conducted by your bank since last five financial years? (Kindly if possible, provide supporting documents/sources). |
| 4. Prospects and Difficulties in Availing Agricultural and SME Loans During Pre-COVID, COVID, and Post-COVID Scenarios | **Q5:** What are the prospects and difficulties your bank has to face for availing agricultural loans during pre – covid, covid and post-covid scenarios?<br><br>**Q6:** What are the prospects and difficulties your bank has to face for availing SMEs loans during pre – covid, covid and post-covid scenarios? |
| 5. Political Pressure and Government Interventions in Credit Disbursement Initiatives | **Q7:** What is the level of political pressure or Government interventions while implementing different credit disbursement initiatives in these two sectors? |
| 6. Suggestion by bankers towards improved designing, implementation, and evaluation Credit | **Q8:** Your suggestions towards designing, implementing and evaluating the credit flow in East India? |

**Annexure B – Questionnaire for farmers**

School of Management
National Institute of Technology Rourkela
Rourkela 769008

# Determinants and Constraints of Credit Flow to the Agricultural Sector in Odisha

## FARMER SCHEDULE

Date of interview: _____ GPS Location: _____
District: _____ Block: _____
Panchayat: _____ Village: _____

## Part A: Respondent Details

| | |
|---|---|
| **1. Name** | |
| **2. Contact number/Mobile** | |
| **3. Age (yrs.)** | |
| **4. Educational Qualification (√)** | Illiterate/Literate/Primary/Secondary/Graduation/PG/Others |
| **5. Caste (√)** | |
| **6. Gender (√)** | |
| **7. Marital Status** | |
| **8. Occupation*** | Primary: |
| | Secondary: |
| **9. Total number of family members/dependents** | |
| **10. Family System** | Joint/. Nuclea/ Tenancy Status |
| **11. Number of family members engaged in farming** | |
| **12. Annual Household Income (Rs.):** | |

**Agriculture & Allied – 1, Agri. Labour – 2, Self Employed in household industry-3, self-employed in services-4, Non-agri casual Labor-5, Salaried work-6, Household work-7, Pension-8, Others-9 (specify)*

**Crops Information:** Income portfolio of the respondents.

| **Agri Produces (in a year)** | **Quantity Sale (in Kg.)** | **Average Price of Sale MSP (in Rs. / kg)** |
|---|---|---|
| Product 1 | | |
| Product 2 | | |
| Product 3 | | |
| Product 4 | | |
| Product 5 | | |
| Others (Mention) | | |
| Business/trade | | |
| Others (Mention if any) | | |

**Farm Asset value** (Enumerators must use their discretion to derive value of assets)

| **Asset Type** | **Quantity/ Units** | **Type** | **In Rs. Thousand/lakh** |
|---|---|---|---|
| Land Owned | | Total value of all land owned | |
| Farm equipment<br>i. Tractor<br>ii. Trolley<br>iii. Power Tiller<br>iv. Tube well<br>v. Thresher<br>vi. Combine harvester<br>vii. Maize Sheller<br>viii. Sprayer<br>ix. Planker | Qty/ Units<br>i. ____<br>ii. ____<br>iii. _____<br>iv. _____<br>v. _____<br>vi. _____<br>vii. _____<br>viii. | Total value of all farm equipment/machinery owned (including tractors etc.) | |
| | | Total value of all buildings/house/store-house/shop/all real estate | |
| Type of live stock<br>i. _____<br>ii. _____<br>iii. _____ | Quantity<br>i. _____<br>ii. _____<br>iii. _____ | Total value of all livestock | |
| | | Others (specify) | |
| | | **Total** | |

**1.** Loanee Farmer YES NO **(**Non-Loanee Farmer)

(taken bank loan in the last three years)

2. If Loanee Farmer source of credit:
   i. Cooperative Bank/Societies,
   ii. Schedule Commercial Bank
   iii. Rural Banks
   iv. Microfinance banks/SHGs
   v. Any other (specify)_____

**3. How much amount of credit you borrowed from formal/informal sources?**

Formal source:
i. bellow 50, 000
ii. 50,000 – 100,000
iii. 100,001 – 200,000
iv. 2001,000 – 300,000
v. Above 300,000

4. Collateral used for credit:
   i. No collateral
   ii. Land
   iii. livestock
   iv. Guarantor
   v. warehouse receipt
   vi. Stored grain
   vii. Others specify_____

5. Reason of Credit:
   i. Variable farm inputs (fertilizer, pesticide, etc.),
   ii. Farm equipment,
   iii. dairy animals,
   iv. crop insurance
   v. Consumption,
   vi. Social obligations,
   vii. Other specify_____

6. Land Holdings Pattern
   i.Own Land
   ii.Leased in
   iii.Leased out
   iv.Uncultivated land
   v.Shared cropping

## Part B: Agri Production Information

1. Operational **Land Holdings** (in acres)

| | **Particulars** | **Irrigated** | **Unirrigated** | **Total** | **Irrigation Source*** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1. | **Own Land** | | | | |
| 2. | **Leased in** | | | | |
| 3. | **Rent paid for leased in land (Rs/acre)** | | | | |
| 4. | **Leased out** | | | | |
| 5. | **Rent received for leased out land (Rs/acre)** | | | | |
| 6. | **Uncultivated land** | | | | |
| 7. | **Net operated Area (1+2-4-6)** | | | | |

**Code: Dug well – 1, Bore well – 2, Canal – 3, Tank – 4, others (specify) – 5*

2. **Cropping Pattern** of last seasons (2022-2023). Kharif (Rainy season), Rabi (Winter season)

| **Crop** | **Area (in acres)** | **Production (Qtl)/Sown** | **Quantity sold (Qtl)/Harvested** | **Price (Rs/Qtl)** |
|---|---|---|---|---|
| | | Main product | **Main product** | **Main product** |
| | Kharif | | | |
| | | | | |
| | | | | |
| | | | | |
| | Rabi | | | |
| | | | | |
| | | | | |
| | | | | |
| GCA* | | | | |

*Gross Cropped Area (Kindly adjust this to meet local requirements)

## Part C:

**Please specify what kind of constraints and difficulties you have faced during borrowing farm credit**

How far is your village from the nearest banks? Km_____

i. Did you face individual collateral (Zamant) problem during borrowing credit by formal sources? Yes ☐ No ☐

ii. Did you face cumbersome procedure of documents problem during borrowing credit by formal source? Yes ☐ No ☐

iii. Did you face delay in loan disbursement problem during borrowing credit by formal source? Yes ☐ No ☐

iv. Did you face not given applied amount problem during borrowing credit by formal source? Yes ☐ No ☐

v. Did you give bribe to loan officer during borrowing credit by formal source? Yes ☐ No ☐

vi. Does banks required mortgage for borrowing credit? (Property as security for the repayment of a loan like land, Gold etc.) Yes ☐ No ☐

vii. Do you think high interest rate is main problem during borrowing credit by formal source? Yes ☐ No ☐

viii. Do you think Group lending is main constraints to access credit? Yes ☐ No
Would you like to avail the bank in future? Yes ☐ No ☐

ix.

x. Any other information you want to share related to improvement of bank credit.

xi. _____
_____
_____
_____

xii.

## Signature/Thump Impression

**Annexure C** Agricultural credit distribution across India as per Jan 2023

| Sl. No | State | Crop Loan | | | | Term Loan | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Account | | Amount Disbursed | | Account | | Amount Disbursed | | Account | | Amount Disbursed | |
| | | No. of A/Cs | % | Amount (Rs in lakhs) | % | No. of A/Cs | % | Amount (Rs in lakhs) | % | No. of A/Cs | % | Amount (Rs in lakhs) | % |
| 1 | Delhi | 55778 | 0.07 | 288456 | 0.28 | 284924 | 0.73 | 1049200 | 1.82 | 340702 | 0.28 | 1337656 | 0.84 |
| 2 | Haryana | 2610862 | 3.24 | 4447364 | 4.38 | 438835 | 1.13 | 1392454 | 2.42 | 3049697 | 2.55 | 5839818 | 3.67 |
| 3 | Himachal Pradesh | 565635 | 0.70 | 736167 | 0.73 | 48248 | 0.12 | 133016 | 0.23 | 613883 | 0.51 | 869183 | 0.55 |
| 4 | Jammu and Kashmir | 909797 | 1.13 | 596454 | 0.59 | 20374 | 0.05 | 186469 | 0.32 | 930171 | 0.78 | 782923 | 0.49 |
| 5 | Punjab | 2397090 | 2.97 | 4829497 | 4.76 | 460830 | 1.18 | 1609823 | 2.80 | 2857920 | 2.39 | 6439320 | 4.05 |
| 6 | Rajasthan | 8271269 | 10.25 | 10982892 | 10.83 | 1625761 | 4.18 | 2774803 | 4.83 | 9897030 | 8.27 | 13757695 | 8.66 |
| 7 | Chandigarh | 3360 | 0.00 | 48919 | 0.05 | 17863 | 0.05 | 75884 | 0.13 | 21223 | 0.02 | 124803 | 0.08 |
| 8 | Ladakh | 217336 | 0.27 | 211995 | 0.21 | 15015 | 0.04 | 30237 | 0.05 | 232351 | 0.19 | 242232 | 0.15 |
| | **Northern Region** | **15031127** | **18.62** | **22141745** | **21.83** | **2911850** | **7.48** | **7251885** | **12.61** | **17942977** | **15.00** | **29393631** | **18.49** |
| 9 | Arunachal Pradesh | 21071 | 0.03 | 47357 | 0.05 | 4698 | 0.01 | 9923 | 0.02 | 25769 | 0.02 | 57280 | 0.04 |
| 10 | Assam | 253042 | 0.31 | 198090 | 0.20 | 238476 | 0.61 | 403333 | 0.70 | 491518 | 0.41 | 601424 | 0.38 |
| 11 | Manipur | 10904 | 0.01 | 11973 | 0.01 | 11459 | 0.03 | 21681 | 0.04 | 22363 | 0.02 | 33654 | 0.02 |
| 12 | Meghalaya | 22033 | 0.03 | 20675 | 0.02 | 27469 | 0.07 | 7205 | 0.01 | 49502 | 0.04 | 27880 | 0.02 |
| 13 | Mizoram | 8529 | 0.01 | 6326 | 0.01 | 16225 | 0.04 | 20083 | 0.03 | 24754 | 0.02 | 26409 | 0.02 |
| 14 | Nagaland | 26269 | 0.03 | 14494 | 0.01 | 4575 | 0.01 | 9015 | 0.02 | 30844 | 0.03 | 23508 | 0.01 |
| 15 | Sikkim | 7956 | 0.01 | 20252 | 0.02 | 5386 | 0.01 | 7321 | 0.01 | 13342 | 0.01 | 27573 | 0.02 |
| 16 | Tripura | 53901 | 0.07 | 43536 | 0.04 | 104370 | 0.27 | 101342 | 0.18 | 158271 | 0.13 | 144878 | 0.09 |
| | **North Eastern Region** | **403705** | **0.50** | **362705** | **0.36** | **412658** | **1.06** | **579902** | **1.01** | **816363** | **0.68** | **942607** | **0.59** |
| 17 | Andman and Nicobar Island | 27618 | 0.03 | 27166 | 0.03 | 25377 | 0.07 | 25144 | 0.04 | 52995 | 0.04 | 52310 | 0.03 |
| 18 | Bihar | 1431085 | 1.77 | 1381367 | 1.36 | 2590713 | 6.66 | 1819676 | 3.16 | 4021798 | 3.36 | 3201043 | 2.01 |
| 19 | Jharkhand | 429129 | 0.53 | 390104 | 0.38 | 744482 | 1.91 | 346576 | 0.60 | 1173611 | 0.98 | 736680 | 0.46 |
| 20 | Odisha | 2867924 | 3.55 | 1693529 | 1.67 | 1808962 | 4.65 | 1195083 | 2.08 | 4676886 | 3.91 | 2888611 | 1.82 |
| 21 | West Bengal | 2472854 | 3.06 | 1608393 | 1.59 | 2123736 | 5.46 | 2509436 | 4.36 | 4596590 | 3.84 | 4117830 | 2.59 |
| | **Eastern Region** | **7228610** | **8.96** | **5100560** | **5.03** | **7293270** | **18.74** | **5895915** | **10.25** | **14521880** | **12.14** | **10996474** | **6.92** |
| 22 | Chhattisgarh | 1952313 | 2.42 | 1567775 | 1.55 | 312030 | 0.80 | 618063 | 1.07 | 2264343 | 1.89 | 2185839 | 1.38 |
| 23 | Madhya Pradesh | 4779386 | 5.92 | 4687815 | 4.62 | 1281218 | 3.29 | 2029686 | 3.53 | 6060604 | 5.07 | 6717501 | 4.23 |
| 24 | Uttarakhand | 520743 | 0.65 | 657253 | 0.65 | 134482 | 0.35 | 289697 | 0.50 | 655225 | 0.55 | 946950 | 0.60 |
| 25 | Uttar Pradesh | 9155481 | 11.34 | 10099801 | 9.96 | 1976742 | 5.08 | 2374078 | 4.13 | 11132223 | 9.31 | 12473880 | 7.85 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Central Region** | **16407923** | **20.33** | **17012645** | **16.77** | **3704472** | **9.52** | **5311525** | **9.24** | **20112395** | **16.81** | **22324170** | **14.05** |
| 26 | Goa | 83541 | 0.10 | 103137 | 0.10 | 37954 | 0.10 | 108130 | 0.19 | 121495 | 0.10 | 211266 | 0.13 |
| 27 | Gujarat | 2990413 | 3.71 | 7015975 | 6.92 | 738226 | 1.90 | 2813573 | 4.89 | 3728639 | 3.12 | 9829548 | 6.18 |
| 28 | Maharashtra | 5241276 | 6.49 | 6475994 | 6.38 | 2266772 | 5.82 | 4684891 | 8.15 | 7508048 | 6.28 | 11160885 | 7.02 |
| 29 | Dadar and Nagar Haveli | 1556 | 0.00 | 7271 | 0.01 | 1349 | 0.00 | 12329 | 0.02 | 2905 | 0.00 | 19600 | 0.01 |
| 30 | Daman and Diu | 168165 | 0.21 | 150452 | 0.15 | 20970 | 0.05 | 51267 | 0.09 | 189135 | 0.16 | 201719 | 0.13 |
| | **Western Region** | **8484951** | **10.51** | **13752829** | **13.56** | **3065271** | **7.87** | **7670189** | **13.34** | **11550222** | **9.65** | **21423018** | **13.48** |
| 31 | Andhra Pradesh | 6946066 | 8.61 | 10061659 | 9.92 | 3910848 | 10.05 | 6807023 | 11.84 | 10856914 | 9.08 | 16868683 | 10.61 |
| 32 | Telangana | 3195350 | 3.96 | 4916318 | 4.85 | 1279661 | 3.29 | 2911602 | 5.06 | 4475011 | 3.74 | 7827920 | 4.93 |
| 33 | Karnataka | 5931615 | 7.35 | 7026238 | 6.93 | 4472300 | 11.49 | 4708343 | 8.19 | 10403915 | 8.70 | 11734581 | 7.38 |
| 34 | Kerala | 4388744 | 5.44 | 5983289 | 5.90 | 2370915 | 6.09 | 3676656 | 6.39 | 6759659 | 5.65 | 9659945 | 6.08 |
| 35 | Puducherry | 143081 | 0.18 | 202395 | 0.20 | 363151 | 0.93 | 498639 | 0.87 | 506232 | 0.42 | 701034 | 0.44 |
| 36 | Tamilnadu | 12271599 | 15.21 | 14542346 | 14.34 | 8721468 | 22.41 | 11483684 | 19.97 | 20993067 | 17.55 | 26026029 | 16.37 |
| 37 | Lakshadweep | 272897 | 0.34 | 341334 | 0.34 | 419873 | 1.08 | 700611 | 1.22 | 692770 | 0.58 | 1041946 | 0.66 |
| | **Southern Region** | **33149352** | **41.07** | **43073579** | **42.46** | **21538216** | **55.33** | **30786558** | **53.55** | **54687568** | **45.71** | **73860137** | **46.47** |
| | **Grand Total** | **80705668** | **100** | **101444062** | **100** | **38925737** | **100** | **57495974** | **100** | **119631405** | **100** | **158940037** | **100** |

Source: Department of Agriculture & Farmers Welfare

**Annexure D** Overall sample characteristics

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total farmers** | 77 | 105 | 102 | 105 | 130 | 101 | 96 | 110 | 107 | 103 | 1036 |
| **Loan status** | | | | | | | | | | | |
| *Availed* | 38 | 92 | 98 | 104 | 124 | 100 | 58 | 91 | 107 | 60 | 872 |
| *Not availed* | 39 | 13 | 4 | 1 | 6 | 1 | 38 | 19 | 0 | 43 | 164 |
| **Gender** | | | | | | | | | | | |
| *Female* | 32 | 90 | 5 | 1 | 72 | 3 | 2 | 57 | 40 | 27 | 329 |
| *Male* | 45 | 15 | 97 | 104 | 58 | 98 | 94 | 53 | 67 | 76 | 707 |
| **Age** | | | | | | | | | | | |
| *20-30* | 10 | 16 | 5 | 3 | 12 | | 6 | 8 | 3 | 7 | 70 |
| *30-40* | 19 | 35 | 10 | 6 | 47 | 12 | 18 | 46 | 29 | 28 | 250 |
| *40-50* | 23 | 28 | 34 | 28 | 34 | 36 | 23 | 36 | 43 | 30 | 315 |
| *50-60* | 14 | 17 | 31 | 34 | 32 | 38 | 35 | 15 | 27 | 28 | 271 |
| *60 & above* | 11 | 9 | 22 | 34 | 5 | 15 | 14 | 5 | 5 | 10 | 130 |
| **Education** | | | | | | | | | | | |
| *Illiterate* | 17 | 15 | 1 | 1 | 10 | 34 | 16 | 7 | 0 | 14 | 115 |
| *Below primary* | 24 | 5 | 5 | 5 | 5 | 26 | 57 | 46 | 5 | 62 | 240 |
| *Primary* | 20 | 53 | 55 | 71 | 74 | 29 | 8 | 37 | 56 | 9 | 412 |
| *Matric* | 10 | 9 | 0 | 0 | 12 | 0 | 0 | 4 | 1 | 1 | 37 |
| *Secondary* | 6 | 22 | 20 | 7 | 23 | 4 | 12 | 16 | 31 | 13 | 154 |
| *Graduation & above* | 0 | 1 | 21 | 21 | 6 | 8 | 3 | 0 | 14 | 4 | 78 |
| **Caste** | | | | | | | | | | | |
| *ST* | 51 | 19 | 20 | 1 | 45 | 50 | 28 | 27 | 30 | 37 | 308 |
| *SC* | 4 | 15 | 7 | 5 | 10 | 9 | 14 | 38 | 19 | 18 | 139 |
| *Other* | 22 | 71 | 75 | 99 | 75 | 42 | 54 | 45 | 58 | 48 | 589 |
| **Marital status** | | | | | | | | | | | |
| *Married* | 72 | 100 | 101 | 102 | 126 | 101 | 94 | 106 | 106 | 102 | 1010 |
| *Others* | 5 | 5 | 1 | 3 | 4 | 0 | 2 | 4 | 1 | 1 | 26 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Family system** | | | | | | | | | | | |
| *Nuclear* | 61 | 83 | 81 | 80 | 105 | 90 | 57 | 89 | 94 | 87 | 827 |
| *Joint* | 16 | 22 | 21 | 25 | 25 | 11 | 39 | 21 | 13 | 16 | 209 |
| **Family size** | | | | | | | | | | | |
| *1 to 5* | 50 | 80 | 70 | 71 | 96 | 65 | 58 | 87 | 83 | 81 | 741 |
| *5 to 10* | 24 | 23 | 30 | 32 | 33 | 36 | 35 | 22 | 21 | 19 | 275 |
| *10 to 15* | 2 | 2 | 2 | 0 | 1 | 0 | 3 | 1 | 2 | 3 | 16 |
| *15 and above* | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 4 |
| **Occupation** | | | | | | | | | | | |
| *Only farming* | 56 | 79 | 88 | 94 | 119 | 99 | 92 | 97 | 103 | 99 | 926 |
| *Others* | 21 | 26 | 14 | 11 | 11 | 2 | 4 | 13 | 4 | 4 | 110 |
| **Annual income** | | | | | | | | | | | |
| *0 – 50000* | 25 | 71 | 0 | 25 | 26 | 12 | 21 | 54 | 17 | 27 | 278 |
| *50000 – 100000* | 26 | 22 | 12 | 25 | 49 | 38 | 59 | 48 | 52 | 29 | 360 |
| *100000 – 150000* | 13 | 6 | 11 | 31 | 37 | 26 | 11 | 3 | 12 | 24 | 174 |
| *150000 – 200000* | 4 | 5 | 15 | 7 | 10 | 11 | 1 | 5 | 5 | 6 | 69 |
| *200000 & above* | 9 | 1 | 64 | 17 | 8 | 14 | 4 | 0 | 21 | 17 | 155 |
| **Type of farmer** | | | | | | | | | | | |
| *Marginal* | 47 | 93 | 16 | 58 | 83 | 50 | 27 | 66 | 22 | 36 | 498 |
| *Small* | 22 | 7 | 23 | 42 | 39 | 39 | 43 | 26 | 60 | 38 | 339 |
| *Semi-medium* | 7 | 4 | 42 | 5 | 7 | 10 | 25 | 17 | 19 | 26 | 162 |
| *Medium* | 1 | 1 | 20 | 0 | 1 | 2 | 1 | 1 | 3 | 2 | 32 |
| *Large* | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 5 |

*Note:* The titles 1 to 10 represents the ten districts and each district is represented as follows; 1 – Sundergarh, 2 – Mayurbhanj, 3 – Kalahandi, 4 – Balasore, 5 – Keonjhar, 6 – Gajapati, 7 – Nabrangpur, 8 – Malkangiri, 9 – Sambalpur, 10 – Koraput.

## Annexure E Case Studies

### Case Study 1: Growing Demand for Millet Crop in Mayurbhanj

Millet has gained recognition as a nutritious dietary option, leading to the designation of 2023 as the 'year of millet.' Odisha has made significant efforts to promote millet cultivation, particularly in regions where the absence of irrigation, characterized by erratic rainfall and year-round water scarcity, has hindered agricultural productivity. Mayurbhanj district has been prioritized for millet cultivation due to its inadequate rainfall and limited irrigation infrastructure.

The appeal of millet cultivation lies in its lower water requirements compared to traditional crops such as paddy, wheat, and vegetables. This has led to its popularity in regions like Moroda and Sulipada, where irrigation is scarce. Millet has shown higher productivity, yielding approximately 1000kg per acre, fetching a favourable market price of Rs 63 per kg. In contrast, irrigated lands of paddy yield about 2500kg per acre, while unirrigated lands yield between 1500kg to 2000kg, with prices ranging from Rs 15 to Rs 21 per kg. However, transitioning to millet cultivation requires a shift in agricultural methodology. Farmers in the area have shown keen interest in growing millet but require proper training in millet production techniques. During field visits, farmers expressed eagerness to learn and the requirement of loans for farm equipment to harvest the crop. They also require credit to produce various processed millet products such as soup powder, papad, cake, and biscuits, which are in high demand in the market. Women's self-help groups (SHGs) have played a significant role in processing millet into traditional Odisha cuisine such as 'pitha' and 'khir.' These products are showcased in rural and state-organized exhibitions and Melas. To fully leverage the export potential of millet, and capitalize on emerging market trends, access to credit is crucial for promoting millet crops.

### Case Study 2: Self-consumption of Paddy in Suliapada Block, Mayurbhanj

Irrigation plays a crucial role in agricultural production. In the Mayurbhanj district, heavy reliance on rainfall as the sole source of irrigation severely impacts cultivation. In Sulipada block, acres of land often remain barren due to the absence of irrigation facilities. As a result, the production of paddy crops has significantly decreased. Thus, farmers produce a limited

amount required for their consumption only. In this situation, farmers perceive taking credit as a risky endeavour.

The condition of the soil has deteriorated over the years due to erratic rainfall and the absence of nearby water sources. Furthermore, farmers receive subsidized rice grains at Rs 1 per kilogram from the state government through ration cards, which is sufficient to sustain their families. This further discourages them from working in unirrigated fields that yield no profit. Consequently, farmers' access to credit is severely impacted in such circumstances, leading to low incomes. Many farmers thus, are considering switching to other economic activities due to the challenges associated with unirrigated agriculture.

**Case Study 3: Destruction of Crops by Wildlife in Champua block of Keonjhar**

In the Champua block of Keonjhar district, farmers shared a keen interest in agricultural practice. However, their endeavours are consistently hindered by the relentless incursions of elephants, resulting in the continuous destruction of crops. Every year, crops in unfenced areas, situated far from the farmers' residences, fall prey to these intrusions. Despite availing themselves of PMFBY insurance to mitigate crop-related adversities, the devastation caused by wildlife remains unaddressed within the ambit of the scheme. This exacerbates the farmers' misery, as the persistent threat of crop failure dissuades them from cultivating areas prone to wildlife encroachment. Such circumstances not only entail financial losses but also dissipate their labour efforts. Consequently, their ability to secure loans and maintain a stable income pattern is compromised. The magnitude of losses incurred due to destruction exceeds the profits derived from cultivating the land, compelling farmers to refrain from cultivation, thereby rendering the land barren. This perpetual cycle not only impacts the economic viability of farming but also underscores the urgent need for interventions to mitigate human-wildlife conflict and safeguard agricultural livelihoods in the region.

**Case Study 4: Storage of Rabi Crops a major issue in Keonjhar**

The Harichandanpur and Ghatagaon blocks of Keonjhar district are irrigated, allowing for the cultivation of both Kharif and Rabi crops. During the Rabi season, farmers in these

blocks primarily grow vegetables such as tomatoes, potatoes, beans, carrots, cabbage, cauliflower, capsicum, and cucumbers. The district is known for cultivating through traditional means, without much use of HYV seeds, fertilisers, and pesticides. Farmers sell their produce at nearby markets such as rural hats, daily markets, and weekly haats. However, since these vegetables cannot be stored for long periods, farmers are compelled to sell them every day at low prices. Despite the potential for higher profits when prices are high, farmers often sell their organically grown produce, such as tomatoes, at significantly lower rates—sometimes as low as Rs 10 to Rs 15 per kilogram, while in urban the prices soar as high as Rs 100 per kilogram.

This situation discourages farmers from cultivating more vegetables, even if they have the capacity to do so. As a result, their ability to take loans during this season is affected. Moreover, farmers cannot utilize their entire land for cultivation, leading to wastage of produce. They believe that this problem could be eliminated by establishing cold storage facilities in each block or Panchayat. Cold storage would help reduce crop wastage by allowing farmers to store their produce and sell it when prices are more favourable, thus increasing their profits and enabling them to cultivate more efficiently.

**Case Study 5: Increased Labour Rate for Farm Equipment in Sambalpur**

In Sambalpur district, agriculture serves as a key economic activity, with double cropping of paddy maximizing production. Farmers, some of whom have taken loans and others who have leased land ranging from 5 to 30 acres, engage in cultivating these plots. Labour costs associated with fieldwork are covered under variable farm costs.

Given the farmers' relative prosperity and the profitability of the sector due to continuous irrigation, they invest in agriculture by purchasing farm equipment such as tractors, power tillers, and harvesters. However, the high labour costs required to operate these machines present a challenge. The labour cost of running a power tiller per day is Rs 350 and along with that other incentives like food and local alcohol are given. The cost thus increases to around Rs 450 to Rs 500 per day. This situation makes farmers hesitant to further invest in equipment. Consequently, the uptake of credit remains stagnant and traditional farming methods yield lower production and require significant efforts from farmers compared to modern technological practices. As a solution to the problem, farmers mentioned if they

could be provided training support from the government on running farm equipment, it would benefit them.

**Case Study 6: Enhancing Fish Farming through Pond Development in Basta, Balasore**

In the gram panchayats of Natakata and Ganipur in Basta block, Balasore, farmers are eager to boost fish farming by expanding the size of their existing ponds. They currently engage in fish culture with various breeds; however, they encounter challenges such as the destruction of certain breeds due to unfavourable conditions created by other fish species. To address this issue and optimize their fish farming operations, farmers are planning to excavate additional ponds on their available land.

Moreover, they express a need for credit to facilitate the water treatment of their existing ponds. Water treatment is essential for maintaining the health and productivity of the fish, ensuring optimal growth and survival rates. Additionally, farmers seek funds to install barricades around their ponds to prevent unauthorized fishing activities by residents, which pose a threat to their livelihoods.

By developing their existing ponds and implementing necessary measures to improve fish farming conditions, farmers aim to enhance their overall productivity and profitability in the region. This initiative not only promises economic benefits for the farmers but also contributes to the sustainable development of aquaculture in Basta, Balasore.

**Case Study 7: Monkey Menace in Badapal, Balasore**

In Badapal gram Panchayat of Balasore, farmers are facing increasing incidents of monkey intrusion, causing significant crop losses and economic strain. The monkey menace poses a complex problem for farmers. Firstly, it directly affects crop yields, leading to financial losses. The damage caused by monkeys reduces both the quantity and quality of harvestable paddy, worsening the economic impact. Additionally, dealing with the monkey problem requires farmers to invest in protective measures like fencing, and diverting resources from other agricultural tasks. This diversion could hinder productivity and worsen financial challenges. Moreover, the psychological impact on farmers is significant.

The constant threat of monkey attacks creates fear and uncertainty, affecting farmers' mental well-being and confidence in their livelihoods. It results in overall tension and generates skepticism among the farmers regarding the decision-making for accessing further credit, as it burdens previous debt.

**Case Study 8: Need for Solarized Irrigation Systems in the hilly areas of Gajapati**

In the hilly regions of Gajapati, farmers are facing significant challenges with irrigation due to geographical conditions. Lifting water to higher elevations is a difficult task, compounded by the limited availability of adequate water sources. While the government has made efforts to supply pipe water to these areas, the low pressure of the water limits its utility primarily to household use.

Farmers in the Gumma block have expressed keen interest in implementing Solar Powered Irrigation Systems (SPIS) to overcome these challenges. SPIS harnesses solar energy to power pumps that supply water to crops, offering a sustainable solution to irrigation needs. These systems are environmentally friendly, emitting minimal emissions, and require no grid connection, making them ideal for remote areas like hilly terrains.

Furthermore, farmers are considering the construction of rainwater harvesting tanks for storage purposes, complementing the SPIS initiative. Rainwater harvesting tanks would enable farmers to store water during periods of abundance, ensuring a steady water supply for irrigation during dry spells.

The introduction of solarized irrigation systems and rainwater harvesting promises to boost agricultural productivity. With reliable water access, farmers can diversify crops and improve yields. While initial investments may require credit, increased income could enhance repayment capacity, reshaping credit dynamics positively.

**Case Study 9: Farmers in Bhawanipatna seek irrigation as Indravati Dam stops supply**

In the Utkela gram Panchayat of Bhawanipatna block, farmers have voiced concerns

regarding the utilization of the Indravati canal. Originally constructed to support agricultural lands and crop producers in Kalahandi, the canal adequately flows during the Kharif season. However, issues arise during the Rabi season.

Due to insufficient rainfall and maintenance work on the right canal of the project, water storage in the reservoir decreases, leading to water release primarily through the left canal. Farmers are then advised to opt for short-duration paddy crops. Although water release adheres to the schedule, some farmers in Karlapada and Kamthana face challenges accessing water from the Indravati Dam.

These farmers encounter difficulties as the canal passes near their fields but at a lower level, hindering the efficient lifting and free flow of water to the upper regions of their fields. This disparity in water distribution creates obstacles for farmers in maximizing their agricultural productivity during the Rabi season, highlighting the need for effective solutions to address irrigation challenges in Kalahandi District.

**Case Study 10: Cotton Crisis - Labour Cost Surge in Kalahandi**

In Kalahandi, a pressing issue has emerged concerning cotton farming: a significant rise in labour charges coupled with a decline in cotton prices. Farmers in the Kesinga and Bhawanipatna blocks, who primarily cultivate cotton, have expressed deep concerns over the escalating costs of labour. Previously, labour rates stood at less than 300 rupees per day, but now labourers are demanding upwards of 450 rupees per day, reaching as high as 500 rupees in some areas.

The surge in labour costs poses a considerable challenge for farmers, especially given the simultaneous decrease in the value of their cotton produce. Two years ago, cotton prices were at 7200 rupees per quintal (72 rupees per kg), but they have since declined to 6500 rupees per quintal (65 rupees per kg). This decrease in earnings coupled with the escalating labour expenses creates a double blow for cotton farmers, impacting their financial stability and ability to access credit. The farmers have continuously requested to establish a procurement centre for Cotton crops. Many farmers rely on credit to pay for labour costs, among other expenses, but the current scenario of rising labour charges and falling product prices presents a significant obstacle to their financial viability. These factors necessitate

interventions and support for cotton farmers in Kalahandi and safeguard their livelihoods.

**Case Study 11: The Miracle of Drip Irrigation: A Case Study of Indian Farmers Overcoming Water Scarcity**

Amidst the arid landscapes of Malkangiri, Kourkonda block, farmers face the common challenge of water scarcity. Due to erratic rainfall and depleting groundwater levels, traditional methods of irrigation do not suffice to sustain their crops. The adversities affected their production and further farmers were reluctant to take loans.

Among these farmers, Laxmi Gouda, a determined woman refused to let adversity dictate the fate of her farm. Determined to find a solution, Laxmi embarked on a journey to explore innovative irrigation techniques that helped her overcome the water scarcity plaguing her village.

Laxmi's quest led her to discover the wonders of drip irrigation—a technique that delivers water directly to the roots of plants through a network of pipes and emitters, minimizing water wastage and maximizing efficiency. Inspired by the potential of this technology, Laxmi convinced her fellow farmers to join her in implementing drip irrigation on their farms. This initiative was further supported by government subsidies and training.

The impact of drip irrigation extended beyond individual farms. The village witnessed resurgence in agricultural productivity, leading to increased incomes and improved livelihoods for the farming community. Moreover, the conservation of water resources through drip irrigation helped mitigate the effects of water scarcity, safeguarding the environment for future generations.

**Case Study 12: Nurturing Resilience: A Case Study of Malkangiri Farmers Overcoming Crop Failures in the Face of High Temperatures**

In the heart of rural Odisha, where the sun blazed relentlessly and the earth thirsted for rain, there lived a community of farmers in Malkangiri whose livelihoods were bound to the whims of the weather. Among them was Irma Padiami, a seasoned farmer whose fields had once flourished with abundant crops but now lay barren under the scorching heat of the

sun. This indirectly affected the income pattern and attitude of farmers towards loan accessibility.

For years, Irma and his fellow farmers had battled against rising temperatures and erratic rainfall, struggling to protect their crops from the ravages of climate change. But despite their best efforts, crop failures had become an all too familiar occurrence, plunging them into despair and uncertainty.

Determined to confront the challenges head-on, Irma sought out innovative solutions to mitigate the impact of high temperatures on his farm. He discovered the concept of climate-smart agriculture—a holistic approach that integrates climate-resilient practices into farming techniques. He planted heat-tolerant crop varieties, installed drip irrigation systems to conserve water, and adopted agroforestry techniques to provide shade and shelter to his crops.

As the seasons changed and the mercury continued to rise, Irma's farm became a beacon of resilience amidst adversity. Despite the unforgiving heat, his fields flourished with healthy crops. Inspired by his perseverance and fruit-yielding action, other farmers began to adopt similar climate-smart practices on their farms. Together, they formed a community of resilient farmers united in their commitment to combatting the impacts of climate change. The farmers in this area are thus, determined to more technological innovation and therefore require credit to sustain their agricultural production.

**Case Study 13: Woes of Money Lenders in Koraput**

In the Podagada village of Koraput district, due to poor connectivity, infrastructure and lack of financial awareness, farmers resorted to money lenders as their last resort.

Among these farmers was Rajesh found himself trapped in a cycle of debt, borrowing money from local moneylenders at exorbitant interest rates starting from 30% to meet his agricultural expenses. As the seasons passed and the burden of debt grew heavier, Rajesh began to feel the suffocating grip of the moneylenders tighten around him. With each loan taken, he sank deeper into indebtedness, his dreams of prosperity fading like the morning mist under the harsh reality of financial exploitation.

Due to poor financial awareness and the gap between banks and farmers in the area, there is a growing power of moneylenders. They thus have sorted to extort the inhabitants of the area. The individual collateral issue's lack of understanding of the financial product and asymmetrical information has made money lenders parasitic. This situation has worsened farmers' ability to commercialize farming.

**Case Study 14: KCC a catalyst for loan intake**

Kisan Credit Card (KCC) scheme, aims at providing farmers with timely and adequate credit for their agricultural and allied activities. Under this scheme, Raghu a farmer in the district of Koraput was able to obtain a Kisan Credit Card from his local bank with simplified documentation and flexible repayment terms.

With the credit available through his KCC, Raghu was able to invest in high-quality seeds, fertilizers, and pesticides, significantly increasing his crop yields. He also used the credit to purchase a small irrigation pump, reducing his dependence on erratic rainfall and improving the resilience of his farm against droughts.

As Raghu's farm prospered, word spread across the village about the benefits of the Kisan Credit Card scheme. Soon, many other farmers followed suit and applied for their own KCCs, leading to a transformation in the agricultural landscape of the region.

The impact of the KCC scheme extended beyond individual farmers like Raghu. It catalysed the growth of agri-businesses and rural economies, creating employment opportunities and boosting local markets. Moreover, by empowering farmers with access to formal credit, the scheme contributed to financial inclusion and poverty reduction in rural India.

**Case Study 15: The Inclination of Farmers towards Informal Credit Sources in Gajapati**

Moneylenders differ significantly from formal sources like banks in Gajapati. One key distinction lies in the instant accessibility of credit provision. Moneylenders offer quick

and easy access to funds, providing emergency assistance for events like marriages and health crises promptly, which is often lacking in formal banking institutions due to delays and procedural complexities. This immediate financial support from moneylenders addresses urgent needs of farmers, fostering a sense of reliability and trust that formal sources struggle to match.

Moreover, the interest rates charged by moneylenders are notably higher compared to formal sources like banks and microfinance institutions (MFIs). While MFIs charge interest rates ranging from 18-24%, moneylenders impose exorbitant rates ranging from 36% to 120%. Despite the lower interest rates offered by formal sources, farmers in Gajapati prefer moneylenders due to the convenience, flexibility, and personalized assistance they provide, especially in times of urgent financial requirements.

The geographical and infrastructural challenges in Gajapati District, such as poor road conditions and the distance to formal banking institutions, further contribute to the preference for moneylenders. These challenges make it easier for farmers to access moneylenders who operate locally and are more responsive to their immediate financial needs. The combination of accessibility, quick assistance, and personalized service distinguishes moneylenders as a preferred credit source over formal channels in the Gajapati District, emphasizing the unique dynamics of credit flow in the region.

**Case Study 16: Popularity of SHG Loans**

The women farmers in Mayurbhanj, Keonjhar, and Sambalpur are highly motivated to participate in agricultural activities, primarily focusing on small-scale and group farming. They receive guidance from organizations like ORMAS, OLM, and NGOs, which encourage them to form women's groups in rural areas and work collectively. These groups are formed under the aegis of the Self-Help Group (SHG) scheme initiated by the Government of India, where women are organized into small groups of at least 10 members. One significant benefit of these groups is access to interest-free loans without the need for collateral, facilitating easy access to funds for both farming and non-farming activities.

Members can request loans individually, but the group's collective agreement is necessary for approval. For instance, if one member needs a loan of 1 lakh rupees, the entire group must

agree for the loan to be sanctioned. However, if the loan is not repaid on time, a seven per cent interest penalty is imposed on the outstanding debt. Many female farmers have utilized these loans for agricultural purposes, benefiting not only themselves but also their spouses who may face challenges in obtaining formal loans due to land-related issues such as family disputes, land estimation problems, lack of land records, and the complex procedure of the Kisan Credit Card (KCC). In such circumstances, SHG loans serve as a lifeline for these farmers.

**Case Study 17: Group Loan (Based on Keonjhar, Mayurbhanj, Sambalpur districts)**

Determinant: Farmers were offered the option of obtaining credit through group loans for agriculture. Some farmers viewed group loans as a positive approach because this would enable them to access larger loan amounts and the entire cultivation process could be divided among the group. Additionally, group loans would provide an opportunity for farmers to collectively acquire farm equipment, which they were unable to access through individual loans.

Constraint: Farmers also noted that group loans can be a bane to them. If any members fail to repay the loan it can put the group in trouble. Similarly, there might be disagreement among the farmers on discussion creating a rift. There is a chance few might misuse the sanctioned loan amount in a group for other purposes.

**Case Study 18: Bank Visit Tragedy in Mayurbhanj district**

Banks serve as formal lenders for loans. In the past, farmers often avoided taking loans from banks due to the volatility of the agriculture sector. Instead, they turned to informal sources for loans. One main reason for this was that banks required more collateral, resulting in farmers receiving less loan amounts. In contrast, informal sources provided lump sum advances with similar collateral requirements. However, loan schemes through Self-Help Groups (SHGs) and Cooperative societies have addressed these issues for farmers. These schemes provide loans at zero interest or low interest rates, making them more accessible to farmers. Despite this, farmers still face challenges when accessing loans from scheduled banks, leading them to rely on these alternative sources.

Farmers in the Mayurbhanj district mentioned that banks often require them to open an account with a minimum balance of Rs 5000. Maintaining such an amount is difficult for farmers, given the unpredictable nature of agriculture. Additionally, some farmers noted that banks sometimes do not have enough cash deposits, leading to delays in loan disbursement. These inconveniences discourage farmers from visiting banks, affecting their daily livelihoods. While loan schemes through SHGs and Cooperative societies have improved access to credit for farmers, challenges remain when dealing with scheduled banks. These challenges include high minimum balance requirements and delays in loan disbursement, impacting farmers' ability to access financial resources essential for their livelihoods.

**Annexure F Performance @ District-Level**

## 1. Classification of Districts Based on Credit Availability

The overall average credit availed across all 10 districts is 84.17%. Based on this benchmark, we classify districts as above-average and below-average performers.

| *Category* | *Districts* | *Credit Availed (%)* |
|---|---|---|
| Above Average (>84.17%) | Keonjhar, Sambalpur, Balasore, Gajapati, Kalahandi, Mayurbhanj | 87.62 - 100.00 |
| Below Average (≤84.17%) | Malkangiri, Nabrangpur, Koraput, Sundergarh | 49.35 - 82.73 |

- Above-average districts include the top-performing ones, which have credit availability rates significantly exceeding the sample average.
- Below-average districts, including Malkangiri, Nabrangpur, Koraput, and Sundergarh, fall short of the overall mean, suggesting potential barriers to credit access.

This classification helps in identifying regions with strong financial accessibility and those requiring policy interventions to enhance credit availability.

## 2. Classification of Districts Based on Credit Constraint

Below is a structured table that categorizes districts based on various credit constraints.

| *Constraint Type* | *Districts Facing High Constraints* | *Implications* |
|---|---|---|
| High Interest Rate Concern | Gajapati, Balasore | Farmers in these districts find borrowing expensive, potentially discouraging credit uptake. |
| Group Lending Constraints | Balasore, Gajapati | Difficulty in forming borrower groups limits access to group-based lending schemes. |
| Non-Receipt of Applied Loan | Kalahandi, Balasore | Farmers applied for credit but faced rejections or delays in loan disbursement. |
| High Non-Borrowers (Low Credit Availability) | Sundergarh, Nabrangpur, Koraput | These districts have a large share of farmers who do not borrow, indicating poor access to bank |

| | | |
|---|---|---|
| | | credit. |
| Collateral Requirement Constraints | Sundergarh, Mayurbhanj | Farmers in these districts struggle to meet collateral requirements, hindering loan approval. |
| Cumbersome Bank Procedures & Loan Delays | Sundergarh, Mayurbhanj | Complex procedures and delays in loan processing make credit access difficult. |

## 3. Performance-Based Classification of Districts (Constraints Wise)

| ***Category*** | ***Districts*** | ***Remarks*** |
|---|---|---|
| Better Performing (Fewer Constraints) | Keonjhar, Sambalpur, Malkangiri, Kalahandi | These districts face fewer credit constraints, making credit access relatively easier. |
| Moderate Constraints | Kalahandi (Loan receipt issue), Mayurbhanj (Collateral & delay issue) | These districts face some barriers but are not among the worst affected. |
| Highly Constrained | Sundergarh, Balasore, Gajapati, Nabrangpur, Koraput | These districts face multiple credit access constraints, including high non-borrowers, collateral issues, loan delays, and high interest rates. |

**Key Observations**:

- Keonjhar, Sambalpur, and Malkangiri emerge as better-performing districts with fewer constraints in accessing credit.
- Balasore, Gajapati, and Sundergarh struggle the most, facing multiple barriers such as high interest rates, group lending issues, loan rejections, and procedural delays.
- Mayurbhanj and Kalahandi have moderate constraints but still face collateral and loan receipt issues.

## Annexure G There Cs of Credit Delivery

**The policy recommendations for catering to the idiosyncratic needs of the tribal population**

**Three Cs of Credit Disbursements** at DDM level in very districts:

| **Contact→** | **Communicate→** | **Credit Delivery** |
|---|---|---|
| → Prospecting Marginal & Small farmers<br>- Both loanee and non-loanee farmers<br>- Gender basis (Male and Female)<br>- Based on land holding (farmers with land, and landless farmers). | →Approach & Presentation About the credit related financial products | →Handle Objections & Follow Up |
| at the Gram Panchayat (GP) Level<br>- Select tribal districts, then blocks with low credit and randomly visit villages.<br>- Every block and GP can be targeted. | - Approach in local language<br>- Communicate how credit can improve the farmers' livelihood based on agriculture and non-agriculture.<br>- Different media vehicles can be selected communicating using local dialect. | - Remove doubts by financial literacy programmes.<br>- Frequent visits by the business correspondents (BCs) for disbursing small loans. |


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