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A Critical Study of Crop Pattern and Financial Resource Utilisation among Tribal Farmers in Maharashtra

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Abstract

Tribal agriculture in Maharashtra represents a unique socio-economic and ecological system shaped by fragmented landholdings, rain-dependent cultivation practices, limited access to institutional finance, and persistent livelihood vulnerabilities. This study critically examines the crop patterns and financial resource utilisation among tribal farmers residing across the Scheduled Tribe–dominated belts of Maharashtra, including districts such as Nandurbar, Palghar, Gadchiroli, Chandrapur, Nashik, Amravati, and parts of Ahmednagar. The research explores how traditional cultivation practices, socio-cultural norms, land ownership patterns, natural resource availability, market accessibility, and credit mechanisms collectively influence cropping decisions and financial behaviour. The study adopts a descriptive-analytical methodology, using both primary and secondary data collected through structured interviews, field observations, government statistical reports, NABARD publications, and academic research. Findings reveal that tribal farmers predominantly follow monocropping systems based on rainfed crops such as paddy, millets, pulses, and minor forest produce–linked seasonal activities. Crop diversification remains limited due to credit constraints, poor irrigation facilities, low awareness of high-value crops, and inadequate market linkages. Financial resource utilisation reflects heavy dependence on informal credit sources including moneylenders, traders, and relatives, attributed to low financial literacy, procedural complexity in institutional loans, collateral issues, and exclusion from mainstream banking. Only a minority access schemes such as Kisan Credit Cards, SHG-bank linkages, and government subsidy programmes. The study highlights the multidimensional impact of finance on cropping choices, risk-taking behaviour, technology adoption, and overall farm productivity. The paper concludes that improving credit accessibility, strengthening irrigation systems, promoting crop diversification, expanding financial literacy, and integrating tribal farmers into formal markets are essential strategies for transforming tribal agriculture. The findings serve as a foundation for policymakers, extension agencies, cooperatives, NGOs, and agricultural financial institutions committed to enhancing tribal livelihoods and sustainable rural development in Maharashtra.

Keywords: Tribal Agriculture, Crop Pattern, Financial Resources, Credit Utilisation, Rural Economy, Maharashtra, Agricultural Livelihoods.

1. Introduction

Agriculture remains the primary source of livelihood for a majority of tribal communities in Maharashtra, forming a crucial component of their socio-economic identity. Spread across regions such as Nandurbar, Palghar, Nashik, Dhule, Chandrapur, Gadchiroli, Amravati, and parts of Ahmednagar, the tribal population relies heavily on land, forests, and rain-dependent cultivation practices. Tribal agriculture is deeply embedded in traditional knowledge systems, customary land use patterns, and community-based ecological management. However, despite this rich indigenous heritage, tribal farmers continue to face persistent challenges related to low productivity, limited access to institutional finance, small landholdings, fragmented plots, and vulnerability to climatic uncertainties.

Crop pattern among tribal farmers in Maharashtra is influenced by a complex interplay of natural, socio-cultural, and economic factors. Predominantly, these farmers follow subsistence-oriented agriculture, growing crops such as paddy, sorghum, bajra, ragi, minor millets, pulses, and oilseeds. Their choices are shaped largely by rainfall patterns, soil type, traditional practices, food security needs, and limited irrigation infrastructure. Unlike

mainstream farming regions where commercial crops and diversification are feasible, tribal agriculture is characterized by low external input usage, minimal mechanisation, and limited market integration. As a result, cropping decisions often reflect risk-avoidance strategies rather than profit-maximising behaviour.

Financial resource utilisation emerges as another significant dimension affecting agricultural outcomes in tribal areas. Access to credit determines a farmer's ability to adopt improved technologies, purchase quality seeds, invest in irrigation, use fertilizers, and diversify crop production. Yet, tribal farmers often remain excluded from formal financial systems due to factors such as lack of collateral, low financial literacy, procedural complexities, inadequate documentation, and limited presence of banking institutions in remote areas. In the absence of accessible formal credit, many resort to borrowing from moneylenders, traders, or informal networks, often at exploitative interest rates. This dependency restricts their ability to invest in productive agricultural activities and perpetuates a cycle of poverty.

Government programmes like the Kisan Credit Card (KCC), SHG–Bank Linkage Programme, crop insurance schemes, and subsidy-based initiatives aim to bridge the financial gap. However, their reach and effectiveness remain uneven in tribal regions, largely due to administrative bottlenecks and lack of awareness. The extent to which tribal farmers are able to utilise available financial resources, and how these financial strategies influence their cropping choices, remains a critical area of inquiry.

This study seeks to provide an in-depth understanding of the crop patterns adopted by tribal farmers and the nature of financial resources they utilise. It also aims to analyse the relationship between financial access and cropping decisions, identifying gaps, challenges, and opportunities for sustainable agricultural development. By examining both structural issues and behavioural responses, the study offers insights that can inform policymakers, extension workers, financial institutions, and development practitioners.

2. Need & Importance of the Study

1. Tribal farmers' cropping decisions are shaped by ecological limitations, traditional practices, and socio-economic vulnerabilities. As climate change intensifies rainfall uncertainties, assessing their crop patterns becomes essential. This study helps identify how tribal farmers select crops, manage risks, and adapt to changing conditions, thereby offering insights for developing region-specific, sustainable agricultural strategies tailored to tribal needs.
2. A large proportion of tribal farmers remain excluded from formal credit institutions due to procedural complexities, poor financial literacy, and limited banking infrastructure. Studying how tribal farmers access and utilise financial resources helps reveal gaps in the credit delivery system and provides a foundation for designing more inclusive financial mechanisms that can enhance farm productivity and livelihood stability.
3. Understanding how financial resources influence cropping patterns is crucial for improving agricultural productivity among tribal communities. Limited access to credit restricts the use of quality seeds, fertilizers, irrigation, and farm technologies. This study highlights the importance of finance in enabling productive investments, ultimately helping policymakers design interventions that enhance income, reduce rural poverty, and ensure sustainable livelihoods.
4. Many tribal farmers rely on informal credit from moneylenders and traders who often charge exploitative interest rates. By studying financial utilisation patterns, the research identifies the reasons for this dependency and proposes strategies to strengthen access to formal financial institutions. This is important for protecting farmers from indebtedness and ensuring access to affordable credit for productive agricultural purposes.
5. Tribal agriculture is largely subsistence-oriented, with limited crop diversification. Financial constraints and low market exposure hinder transitions to high-value crops, horticulture, or allied activities. This study underscores the significance of accessible finance in enabling diversification. The findings can guide programmes that aim to connect tribal farmers to markets, value chains, and income-enhancing agricultural opportunities.
6. Government initiatives such as Kisan Credit Cards, SHG–Bank Linkages, subsidies, and crop insurance play a crucial role in supporting tribal agriculture. However, their implementation often remains inadequate. This study identifies challenges related to awareness, accessibility, and utilisation of these schemes. The insights help improve policy design and delivery mechanisms targeting tribal agricultural development.

7. There is limited empirical research on crop patterns and financial utilisation among tribal farmers in Maharashtra. This study fills a crucial knowledge gap by providing data-driven insights into the socio-economic realities of tribal farming. Its importance lies in supporting academic research, informing developmental NGOs, strengthening institutional interventions, and contributing to a deeper understanding of tribal livelihood systems.

3. Objectives of the Study

1. To analyse the existing crop pattern followed by tribal farmers in Maharashtra by identifying major crops, seasonal variations, land-use patterns, and the factors influencing cropping decisions.
2. To examine the utilisation of financial resources among tribal farmers, including formal and informal credit sources, access to institutional finance, and patterns of borrowing and repayment.
3. To assess the relationship between crop pattern and financial resource utilisation, and to determine how credit availability influences crop choice, input purchase, productivity, and income.
4. To study the socio-economic characteristics of tribal farmers—such as landholding, literacy, income levels, and dependency ratios—affecting agricultural decision-making and access to financial services.
5. To identify the major constraints faced by tribal farmers in crop cultivation, such as irrigation scarcity, soil limitations, climate risk, market fluctuations, and labour shortages.
6. To explore the challenges related to financial access, including documentation barriers, collateral issues, interest burden, lack of awareness, and distance to banking facilities.
7. To suggest policy recommendations and agricultural–financial strategies for improving crop productivity, sustainable cultivation practices, and effective utilisation of financial resources among tribal farmers.

4. Conceptual Framework

The conceptual framework for this study integrates the socio-economic realities of tribal agriculture with theoretical perspectives that explain crop choices, financial behaviour, and livelihood strategies. Tribal farming systems in Maharashtra are shaped by ecological conditions, traditional practices, market access, institutional support, and resource availability. The framework encompasses three major dimensions: (1) Tribal agricultural ecology and crop pattern determinants, (2) financial resource utilisation and livelihood economics, and (3) theoretical foundations drawn from rural development, agricultural economics, and behavioural finance.

4.1 Tribal Agricultural Ecology and Crop Pattern Determinants

Tribal agriculture is deeply intertwined with the natural environment in which these communities live. The dominant tribal regions of Maharashtra such as Nandurbar, Palghar, Nashik, Dhule, and Amravati are characterised by hilly terrains, forest cover, and rainfed agriculture. In these areas, crop pattern is primarily determined by monsoonal rainfall, soil fertility, traditional knowledge, and risk-mitigating behaviour. Because irrigation facilities are limited, farmers depend heavily on kharif crops such as paddy, jowar, bajra, ragi, pulses, and oilseeds.

Traditional knowledge plays a strong role in tribal cropping decisions. Tribal communities often cultivate crops that align with their cultural habits, food security needs, and ecological compatibility. Millets, for example, are widely grown due to their drought resistance and adaptability. Similarly, cultivation of minor pulses and tubers is linked with the availability of forest produce and indigenous cultivation practices.

Market access also significantly shapes crop patterns. Remote tribal villages often lack proper transportation, market yards, and procurement facilities. Due to low market integration, farmers prefer crops with low input requirements and minimal dependence on external technologies. This subsistence orientation leads to low diversification. Cash crops such as cotton or soybeans are grown only where irrigation or market access is relatively better.

Overall, crop patterns reflect a combination of risk aversion, low-input agriculture, and ecological alignment, underscoring the need for financial and infrastructural interventions that can help tribal farmers diversify and modernise their cropping systems.

4.2 Financial Resource Utilisation and Livelihood Economics

Financial resources whether formal or informal play a critical role in shaping the agricultural decisions of tribal farmers. Access to credit determines whether a farmer can buy quality seeds, fertilizers, pesticides, and implements, or invest in irrigation, mechanisation, and diversification. However, tribal farmers face multiple barriers in accessing institutional finance.

Formal credit institutions require documentation, collateral, and credit history, which many tribal farmers do not possess. As a result, they often depend on moneylenders, local traders, or community borrowing, often at high interest rates. This informal credit dependency restricts their ability to invest effectively in agriculture, trapping them in a cycle of low productivity and poverty.

Government schemes such as the Kisan Credit Card (KCC), Pradhan Mantri Fasal Bima Yojana, subsidy programmes, and tribal development schemes aim to improve financial access. However, awareness levels remain low, and procedural challenges limit adoption. Hence, even when financial resources are available, utilisation remains inadequate.

SHG–Bank Linkage Programmes have improved financial inclusion in several tribal regions by fostering community-based savings and credit habits. Microfinance and cooperative credit systems have also played a significant role in supporting small-scale economic activities.

Financial resource utilisation in tribal areas thus has three major patterns:

1. High dependence on informal credit
2. Limited utilisation of formal banking facilities
3. Suboptimal investment in productive agricultural activities

Understanding these patterns provides the basis for policies aimed at enhancing financial literacy, improving credit outreach, and ensuring that financial resources translate into improved agricultural performance.

4.3 Theoretical Foundations

The present study draws upon several theoretical frameworks that explain tribal agricultural behaviour, livelihood decisions, and financial utilisation.

1. **Sustainable Livelihoods Framework (SLF):** The SLF helps in understanding how tribal farmers utilise natural, financial, human, social, and physical capital to sustain their livelihoods. It explains how vulnerabilities such as rainfall uncertainty, market fluctuations, and financial exclusion affect agricultural choices. The framework emphasises strengthening livelihood assets for enhanced resilience.
2. **Theory of Agricultural Household Behaviour:** This theory recognises that small and tribal farmers make farming decisions not solely based on profit but on food security needs, risk management, labour availability, and cultural traditions. It explains why tribal farmers often continue subsistence farming despite low profitability.
3. **Credit Rationing Theory (Stiglitz & Weiss):** The theory explains why banks often restrict credit to small or tribal farmers due to perceived risks, lack of collateral, and information asymmetry. It helps analyse the barriers tribal farmers face in accessing institutional finance.
4. **Diffusion of Innovations Theory (Everett Rogers):** This theory explains how new agricultural practices such as crop diversification, hybrid seeds, or mechanisation spread in rural communities. It provides a basis for understanding why tribal farmers may adopt innovations slowly due to limited information, risk aversion, or lack of credit.

5. **Behavioural Finance Theory:** It explains how psychological factors influence farmers' financial decision-making. Tribal farmers, due to socio-cultural and economic constraints, often exhibit risk-averse behaviour, preferring safe, traditional crops and low borrowing.
6. **Ecological Modernization Theory:** This theory highlights how integrating modern agricultural technologies with ecological sustainability can transform traditional farming systems. It is relevant for tribal agriculture, which requires a balance of modern methods with ecological sensitivity.

The study integrates ecological, financial, and theoretical perspectives to understand crop patterns and financial behaviour of tribal farmers. It highlights that tribal agriculture is shaped by natural conditions, socio-cultural factors, financial limitations, and institutional barriers. A holistic conceptual approach is essential to design policies that support sustainable agricultural development for tribal communities.

5. Review of Literature

The literature on tribal agriculture, crop patterns, and financial resource utilisation in India reflects a multidisciplinary understanding rooted in agricultural economics, rural development, and socio-anthropological studies. Numerous scholars have examined the agricultural practices of tribal communities, highlighting their dependence on rainfed farming, low-input agriculture, and traditional cropping systems.

Patel (2012) studied cropping patterns among tribal farmers in Gujarat and found a strong dependence on monsoon-based cereals such as millets, sorghum, and rice, emphasising that irrigation scarcity and subsistence need largely determine crop choices. **Sharma & Meena (2015)** explored the cropping systems in tribal districts of Rajasthan and documented limited diversification due to socio-economic constraints and inadequate market linkages. Their findings align with the situation in Maharashtra's tribal belts where subsistence crops dominate.

Financial resource utilisation has also received academic attention. **NABARD (2018)** highlighted that tribal farmers rely heavily on informal credit sources due to the absence of adequate banking facilities, lack of collateral, and low financial literacy. This resonates with **Kumar & Singh (2017)** who observed that formal banking often fails to reach remote tribal regions, resulting in dependence on moneylenders and local traders.

Studies have also examined the link between finance and productivity. **Reddy (2014)** documented how formal credit significantly improves input use, crop yields, and diversification among small and marginal farmers. Similar conclusions were reached by **Mahato (2019)** in Jharkhand, who reported that institutional credit encourages farmers to adopt improved seeds, fertilizers, and irrigation technologies. However, tribal farmers' limited access to such credit restricts agricultural progress.

Research by **Bharadwaj (2016)** emphasized the role of government schemes such as SHG–Bank Linkage and Kisan Credit Cards in promoting financial inclusion, although their penetration remains limited in tribal areas due to awareness issues. **Deshmukh (2020)** studied tribal regions of Maharashtra and identified structural barriers poor documentation, low literacy, and socio-cultural isolation—as major obstacles to accessing formal credit.

Several scholars also focused on livelihood strategies. **Chauhan (2018)** argued that tribal farmers adopt low-risk crop patterns due to vulnerability to climate and market fluctuations. This is supported by **Kamble (2021)** who found that tribal agriculture is resilient but economically stagnant due to low investment levels.

Overall, the literature consistently points towards three major themes: (1) tribal farmers predominantly follow subsistence-oriented cropping systems, (2) financial exclusion significantly hampers agricultural growth, and (3) improving credit accessibility and promoting diversification is essential for sustainable tribal development. However, there remains a research gap regarding a comprehensive Maharashtra-centric analysis that integrates crop pattern and financial utilisation highlighting the relevance of the present study.

6. Research Methodology

The research methodology outlines the systematic steps followed to explore the crop patterns and financial resource utilisation among tribal farmers in Maharashtra. The tribal belts of Maharashtra exhibit unique

socio-economic, cultural, and geographical characteristics that significantly influence agricultural behaviour. A mixed-method approach was adopted to achieve comprehensive and reliable findings.

6.1 Research Design

The study employed a descriptive-analytical research design supplemented by field-based empirical data. The descriptive component enabled an in-depth understanding of existing crop patterns, credit behaviour, farming practices, and livelihood strategies among tribal communities. The analytical component facilitated examining the relationship between crop choice and financial resource access. Both qualitative and quantitative elements were integrated, ensuring rich insights grounded in field realities. Structured interviews, observation schedules, secondary datasets, and statistical analysis tools were used to analyse patterns, gaps, and contributing factors. The study emphasised realism, accuracy, and representation of tribal socio-economic conditions.

6.2 Universe of the Study

The universe for the study comprised tribal farmers residing in Scheduled Tribe–dominated regions of Maharashtra, including districts such as: Nandurbar, Palghar, Dhule, Nashik, Ahmednagar (tribal pockets)

These regions were selected due to high tribal concentration, prevalence of rainfed agriculture, and limited financial outreach. The population includes small and marginal farmers dependent on subsistence agriculture.

6.3 Sampling Technique

A multistage purposive sampling method was adopted:

1. **Stage 1 - District Selection:** Districts with the highest tribal population were purposively selected.
2. **Stage 2 - Village Selection:** Villages with high tribal concentration, low irrigation access, and active agricultural practices were chosen.
3. **Stage 3 - Respondent Selection:** From each village, 20–25 tribal farmers representing small/marginal holdings, varied crop patterns, and diverse financial access were selected randomly.

6.4. Sample Size: *N = 200 tribal farmers*

The sample is statistically suitable for descriptive and comparative analysis.

6.5 Data Collection Tools

The following tools were used:

a) Structured Interview Schedule: Questions related to crop choice, inputs, credit sources, income levels, and socio-economic characteristics.

b) Observation Checklist: Used to verify cropping practices, irrigation systems, land quality, and farm equipment.

c) Secondary Data: Collected from:

- Government Agriculture Department Reports
- NABARD Annual Reports
- District Statistical Handbooks
- Census Reports
- Research Papers and Journals

d) Focus Group Discussions (FGDs): To understand cultural preferences, collective behaviour, and credit patterns.

e) Key Informant Interviews: Discussions with agricultural officers, bankers, SHG leaders, NGO workers, and village elders.

This triangulated method ensured validity, reliability, and authenticity of data.

Table 1: Crop Pattern among Tribal Farmers (N = 200)

Crop Type	Percentage of Farmers (%)
Millets (Jowar, Bajra, Ragi)	42%
Paddy	28%
Pulses (Tur, Moong, Udid)	16%
Oilseeds (Soybean, Groundnut)	10%
Vegetables/Horticulture	4%

Interpretation

The table shows that tribal farmers predominantly rely on millets and paddy, which aligns with their subsistence needs and rainfed conditions. Very few engage in high-value crops, indicating limited diversification due to financial and infrastructural barriers.

Table 2: Sources of Finance Utilised by Tribal Farmers

Source of Finance	Percentage (%)
Moneylenders	46%
Relatives/Community Borrowing	24%
Banks	18%
Cooperative Societies	7%
SHGs/Microfinance	5%

Interpretation

Informal sources dominate financial behaviour among tribal farmers. Nearly 70% depend on non-institutional credit, indicating poor penetration of formal financial systems. Banks and cooperatives have limited outreach due to documentation barriers, distance, and low trust.

Table 3: Relationship Between Financial Access and Crop Diversification

Financial Access	Diversified Crops	Subsistence Crops
Formal Credit Users	58%	42%
Informal Credit Users	22%	78%

Interpretation

The table demonstrates a strong correlation between formal financial access and crop diversification. Farmers with bank or cooperative credit invest in diverse and high-value crops. Informal borrowers, burdened by high interest rates, remain confined to low-input subsistence crops.

7. Results And Discussion

The results of the study reveal a multifaceted picture of tribal agriculture in Maharashtra, shaped by ecological constraints, socio-economic vulnerabilities, financial exclusion, and traditional knowledge systems. Tribal farmers largely operate within small and marginal landholdings, which significantly influences their cropping choices and limits their capacity for diversification. The analysis indicates that crop pattern remains

predominantly subsistence-oriented, with a strong focus on millets, paddy, and pulses. These crops require minimal external inputs, are resilient to climatic variations, and align with the dietary habits of tribal households.

The findings highlight that millets account for the largest share (42%) of cultivation, followed by paddy at 28%. The dominance of these crops reflects the heavy dependence on the monsoon and the lack of irrigation facilities in most tribal regions. Horticulture and vegetable cultivation though economically promising remain minimal due to inadequate financial support, limited market connectivity, and uncertainty associated with perishable crops.

The financial resource utilisation analysis underscores a stark divide between formal and informal credit systems. A significant proportion of tribal farmers almost 70% rely on informal credit sources such as moneylenders and community networks. The reasons are deeply structural: lack of documentation, limited banking infrastructure, fear of complex loan procedures, and low financial literacy. Although government schemes such as the Kisan Credit Card (KCC) aim to enhance institutional credit access, actual utilisation remains limited.

Formal credit users demonstrate greater adoption of modern agricultural inputs, including improved seed varieties, fertilizers, and irrigation equipment. The study's data clearly show that farmers with institutional credit access exhibit higher crop diversification (58%), compared to only 22% among informal credit users. This establishes a direct and positive relationship between financial inclusion and agricultural modernisation.

The results also revealed that tribal farmers' financial behaviour is influenced by traditional practices and risk perception. Since agriculture in tribal areas is highly vulnerable to environmental fluctuation, farmers tend to avoid high-risk investments. This risk aversion explains their preference for low-cost crops and minimal use of credit for agriculture. The findings mirror similar studies conducted in Jharkhand (Mahato, 2019) and Gujarat (Patel, 2012), where structural and cultural factors shape financial decisions.

The study also found socio-economic barriers that restrict progress. Illiteracy, poor access to markets, lack of storage facilities, and weak extension services hinder tribal farmers from taking advantage of modern agricultural technologies. Financial institutions also fail to effectively engage with tribal communities due to distance, communication gaps, and administrative rigidities.

In summary, the results indicate that crop pattern and financial utilisation are closely intertwined, and both are significantly constrained by systemic limitations. Improving credit access, providing training on modern farming practices, expanding irrigation networks, and strengthening market linkages can catalyse positive transformation. The discussion clearly shows that without structural reforms and targeted policy support, tribal agriculture will continue to operate below its potential. The results thus serve as a critical foundation for designing interventions aimed at enhancing livelihood security and economic empowerment among tribal farmers.

8. Challenges Identified in choices and the utilisation of financial resources

Agriculture in tribal regions of Maharashtra continues to face multiple structural, financial, and socio-environmental challenges that significantly influence crop choices and the utilisation of financial resources. One of the foremost challenges is limited access to institutional finance. Despite various government schemes, a large proportion of tribal farmers still depend on informal lenders due to inadequate banking services, complex procedures, and lack of required documentation. This dependence leads to high-interest liabilities, ultimately restricting investment in diversified or improved crop practices.

Another major issue relates to poor irrigation facilities. Most tribal regions are rain-dependent; therefore, unpredictable monsoons and prolonged dry spells reduce crop yields. The lack of proper water management restricts farmers from adopting profitable rabi crops or multiple cropping patterns. This further contributes to unstable farm income and discourages risk-taking in adopting modern agricultural technologies.

Tribal farmers also face limited technical knowledge and training gaps, which affects their understanding of improved seed varieties, soil management, fertiliser use, and mechanisation. Extension services are inadequate, resulting in slow adoption of innovative or diversified cropping systems. Additionally, market inaccessibility and

poor transportation facilities force farmers to sell produce at lower prices within local markets, reducing the economic benefits of farming.

Socio-economic factors such as small and fragmented landholdings, low literacy levels, and migration during lean seasons add further challenges to effective crop management and financial utilisation. Environmental challenges like soil degradation, pest outbreaks, and climate variability increase production risks. These cumulative constraints limit the capacity of tribal farmers to optimise crop patterns and utilise financial resources in a productive and sustainable manner.

9. Findings of the Study

1. The study found that tribal farmers mainly cultivate subsistence crops such as millets, paddy, and pulses due to rain-dependent agriculture, low irrigation facilities, and traditional preferences. This monocropping practice limits diversification opportunities and restricts income enhancement, keeping tribal farmers within low-risk and low-return agricultural systems.
2. A majority of tribal farmers rely on moneylenders, relatives, and traders for financial needs. The dominance of informal credit is driven by lack of banking access, procedural complexities, and low financial literacy. This dependence results in high interest burdens, restricting productive investment and reinforcing poverty cycles.
3. Only a small proportion of tribal farmers use institutional financial services such as bank loans, Kisan Credit Cards, or cooperative credit. Documentation issues, collateral requirements, and mistrust of formal systems hinder access. This limited engagement restricts technology adoption, input use, and long-term agricultural development.
4. Farmers who successfully accessed formal credit exhibited higher levels of crop diversification, including vegetables, oilseeds, and market-oriented crops. Access to financial resources enabled investment in better seeds, fertilizers, and irrigation. This demonstrates that financial inclusion significantly influences modernisation and increased productivity in tribal agriculture.
5. Most tribal agricultural areas lack adequate irrigation infrastructure, leading to dependence on monsoon rainfall. This severely limits cropping intensity, restricts rabi cultivation, and discourages farmers from adopting high-value or commercial crops. Water scarcity emerges as a major barrier to enhancing productivity and economic resilience.
6. Tribal farmers face limited market access due to poor transportation, lack of procurement centres, and weak storage facilities. This discourages them from producing market-linked crops. The absence of market information and pricing mechanisms restricts income-generation opportunities and sustains traditional, low-yield agricultural practices.
7. Although several financial and agricultural schemes exist, their utilisation among tribal farmers remains low due to lack of awareness and ineffective implementation. Enhanced financial literacy, farmer training, and proactive extension services are essential for ensuring tribal communities benefit from government-supported agricultural development programmes.

10. Recommendations

1. Financial institutions must simplify loan procedures, relax collateral norms, and establish mobile banking units to reach remote tribal villages. Strengthening KCC coverage, SHG–bank linkages, and cooperative credit systems will reduce dependence on informal lenders and enable farmers to invest confidently in productive agricultural activities.
2. Government agencies should prioritise constructing small check dams, lift-irrigation schemes, farm ponds, and micro-irrigation facilities. Providing subsidies for drip and sprinkler systems can significantly reduce rainfall dependency. Improved irrigation access will promote rabi cultivation, crop diversification, and sustainable agricultural productivity among tribal communities.
3. Agriculture extension departments should organise regular training on high-value crops, horticulture, spices, and climate-resilient varieties. Demonstration plots in tribal villages can motivate farmers to adopt profitable crops. Diversification will reduce risk, enhance income, and ensure better utilisation of available land and resources.

4. Developing rural markets, farmer–producer companies (FPOs), mobile procurement centres, and transportation facilities will integrate tribal farmers into formal markets. Ensuring MSP procurement and establishing storage/processing units will increase profitability, reduce wastage, and build stronger rural value chains.
5. Special campaigns must be conducted to educate tribal farmers about government schemes, banking procedures, interest rates, and documentation. Training on budgeting, savings, credit utilisation, and online transactions will empower farmers to make informed financial decisions and reduce exploitation by informal moneylenders.
6. Self-help groups should be expanded in tribal areas to promote savings habits, collective bargaining, and access to microcredit. Linking SHGs with banks can provide easier and reliable financing options, especially for women farmers, thereby improving household income stability and reducing financial vulnerability.
7. Providing subsidised farm tools, mini-tractors, harvesters, and improved seed varieties can enhance productivity among tribal farmers. Mobile-based advisory services, soil health cards, and ICT tools should be promoted to bridge the technology gap and support scientific agriculture in tribal regions.
8. More field facilitators, Krishi Sevaks, and agricultural assistants should be appointed in tribal regions. Regular farm visits, crop advisories, soil and pest management training, and farmer field schools will help farmers adopt modern practices and increase crop yields sustainably.
9. Encouraging organic farming, agroforestry, mixed cropping, and moisture-conservation techniques will help tribal farmers adapt to climate risks. Training in rainwater harvesting, mulching, and drought-resistant crops can enhance ecological stability and long-term sustainability of tribal farming systems.
10. A transparent and systematic monitoring framework must be adopted to ensure effective implementation of tribal agricultural schemes. Local committees, NGOs, and panchayat institutions should be involved in tracking progress, addressing grievances, and improving delivery mechanisms for credit, subsidies, and agricultural support systems.

11. Conclusion

The present study reveals that crop pattern and financial resource utilisation among tribal farmers in Maharashtra are deeply influenced by socio-economic, environmental, and infrastructural conditions. Tribal agriculture continues to rely heavily on traditional, low-input cropping systems dominated by rainfed crops such as millets, pulses, and paddy. While these crops are climate-resilient and culturally significant, they often provide limited economic returns, which restricts livelihood enhancement. The study also shows that financial inclusion remains a major concern. Although government schemes and institutional credit facilities exist, their utilisation remains low due to procedural complexities, lack of awareness, and poor accessibility. As a result, many farmers continue to depend on informal credit sources, increasing their financial vulnerability.

The research highlights that inadequate irrigation, limited access to markets, low technological adoption, and small fragmented landholdings further constrain tribal farmers from diversifying crop patterns or improving productivity. However, the study also identifies emerging opportunities such as horticulture, minor forest produces integration, watershed development, and micro-irrigation systems that can transform tribal agriculture.

Overall, the study concludes that improving financial access, strengthening agricultural extension, enhancing irrigation infrastructure, and promoting sustainable crop diversification are essential for empowering tribal farmers and ensuring long-term agricultural and economic resilience in Maharashtra.

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