Sustainable Coffee Farming in Koraput Challenges and Opportunities for Coffee Farmers A Study in Koraput District of Odisha

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***Abstract*—This study explores the challenges and opportunities faced by coffee farmers in Koraput, Odisha, India, in adopting sustainable coffee farming practices. The research aims to identify the key factors influencing coffee farming and to develop strategies for promoting sustainable agriculture practices in the region. Using a mixed-methods approach, this study collects data from coffee farmers, extension agents, and other stakeholders. The findings highlight the major challenges faced by coffee farmers, including climate change, market durability, and lack of access to water and modern methods. The study also identifies opportunities for sustainable coffee farming, such as organic certification and fair-trade practices. The conclusions drawn from this study can inform policy and development initiatives aimed at supporting coffee farmers in Koraput and promoting sustainable agriculture practices in the region.**

***Index Terms*—coffee farmers, sustainable, fair-trade practice, Odisha**

I. INTRODUCTION

Coffee cultivation plays a significant role in the livelihoods of tribal communities in India, particularly in regions with favourable climatic and geographical conditions. The Koraput district of Odisha has emerged as an important coffee-growing region due to its hilly terrain, fertile soil, and suitable climate. The district primarily cultivates Arabica coffee, which is known for its high quality and distinctive flavour.

The recognition of Koraput coffee through the award of a Geographical Indication (GI) tag in 2019 enhanced its market visibility and highlighted the contribution of tribal farmers to coffee production. Despite this achievement, coffee farmers in the region continue to face several challenges, including inadequate infrastructure, limited access to technical knowledge, market uncertainties, price fluctuations, and insufficient institutional support. Additionally, climate

variability, pest infestations, and resource constraints pose significant threats to the sustainability of coffee farming.

In recent years, sustainable coffee farming has gained importance as a strategy to improve productivity while conserving natural resources. Sustainable practices such as organic cultivation, efficient water management, environmentally friendly farming techniques, and fair market access can enhance both farmer livelihoods and environmental outcomes. Various organizations, including the Coffee Board of India and TDCCOL, have undertaken initiatives to support coffee growers through training programs, input supply, and marketing assistance.

This study examines the challenges and opportunities associated with sustainable coffee farming in Koraput district. It specifically compares the experiences of coffee farmers from two villages to understand variations in access to support systems, production practices, marketing opportunities, and livelihood outcomes. The findings are expected to contribute to a better understanding of local-level disparities and provide insights for strengthening policies and development initiatives aimed at promoting sustainable coffee cultivation and improving the socio-economic conditions of coffee farmers in the region.

II. REVIEW OF LITERATURE

Geddam Teja Sri et al. (2022) studied the profitability of coffee cultivation in Araku Valley, Andhra Pradesh, using primary data collected from 120 coffee growers through purposive sampling. The study found that coffee farming was highly profitable, with a Benefit-Cost Ratio of 1.68 and an Internal Rate of Return of 28.7%. The authors concluded that coffee cultivation is a financially viable and sustainable saleable activity in the region.

Das, Pattanayak, and Mallick (2020) studied the technical competencies and challenges of coffee production in Odisha. The study found that coffee cultivation faces several restrictions, including limited farmer awareness, labour shortages, inadequate marketing facilities, low prices, pest infestations, and deficient government support. These challenges have negatively affected both the productivity and quality of coffee produced in the region.

Nayak et al. (2023) analyzed trends in coffee area, production, and productivity in Chikkamagaluru district of Karnataka using data from 1995–96 to 2019–20. The study found that although the area under coffee cultivation increased over time, coffee productivity showed a declining trend, highlighting challenges in maintaining production proficiency.

Prabha et al. (2021) analyzed trends in the area, production, and yield of coffee in India using CAGR and ARIMA models. The study found that the area and production of both Arabica and Robusta coffee increased over time, while the productivity of Arabica coffee showed a declining trend, signifying challenges in cultivating yield despite expansion in cultivation.

Karunakaran (2017) examined the economic aspects of coffee cultivation in Kerala. The study identified major challenges faced by coffee growers, as well as labour shortages, pest and disease attacks, high production costs, price fluctuations, marketing constraints, and climate variability.

Despite these challenges, the study found that coffee cultivation remained a profitable enterprise, supported by initiatives of the Coffee Board of India.

Pongener and Das (2021) examined the economics of Arabica coffee cultivation in Nagaland using data from 60 coffee growers. The study found that coffee cultivation was a profitable enterprise, with a benefit-cost ratio of 1.6. Though, low productivity was attributed to labour shortages, limited technical knowledge, and inadequate use of inputs, highlighting the need for improved plantation management practices.

Satish Kumar et al. (2019) examined the factors influencing coffee production and its effect on the livelihoods of tribal farmers in Visakhapatnam district, Andhra Pradesh. The study found that farm size and farming experience positively influenced coffee production, while coffee cultivation significantly improved farmers' income and socioeconomic conditions, making it a profitable livelihood option.

Naidu (2018) examined the historical development of the coffee industry in India. The study highlighted India's position as a major global coffee producer, with Karnataka, Kerala, and Tamil Nadu accounting for most of the country's production. It also noted the growing dominance of Robusta coffee due to its higher production and resistance to diseases compared to Arabica varieties.

Malyadri (2016) examined the status of coffee plantations in India with a focus on innovation and sustainability. The study highlighted the environmental benefits of India's shade-grown coffee system and emphasized the importance of sustainable cultivation practices. It also noted that climate change poses an important threat to coffee production in several coffee-growing regions.

Soujanya and Venkataraman (2022) analysed the performance of the Indian coffee sector from 1961 to 2020 using trend, instability, and decomposition analyses. The study found significant growth in coffee cultivation area and production, particularly during the post-liberalization period. However, India's attractiveness in the global coffee market remained low, leading the authors to recommend the adoption of high-yielding and disease-resistant coffee varieties to improve productivity and export performance.

Puri and Chowdhury (2024) examined sustainable farming practices in India and highlighted the importance of organic farming, crop rotation, integrated pest organization, and efficient resource use. The study emphasized the role of modern technologies such as artificial intelligence, big data, and advanced irrigation systems in improving agricultural sustainability, productivity, and environmental conservation.

Venkatesh (2014) examined the challenges of sustainable coffee cultivation in India. The study highlighted the environmental benefits of shade-grown coffee systems and identified major challenges such as pest and disease infestations, including coffee leaf rust and white stem borer. It also found that limited farmer awareness and constraints in adopting eco-friendly supervision practices hinder the sustainability of coffee cultivation.

Upendranadh and Subbaiah (2012) examined the marketing challenges faced by small coffee growers in India. The study found that small farmers receive a limited share of the coffee value chain due to market inefficiencies and weak bartering power. It emphasized the need for stronger

institutional support, cooperative initiatives, certification programs, and improved market access to enhance farmers' livelihoods and promote sustainable coffee production.

Gois, Thomé, and Balogh (2022) examined the structure and competitiveness of the global coffee market using export competitiveness indicators. The study found that the international coffee market is relatively unconcentrated and dynamic, with countries such as Brazil, Colombia, Ethiopia, and India representing strong competitiveness. The findings highlighted increasing specialization and competition in global coffee exports.

III. OBJECTIVE OF THE STUDY

1. To find out the challenges faced by coffee workers in Koraput district.
2. To find out the opportunities in coffee farming.

IV. AREA OF THE STUDY

The study was conducted in Koraput district of Odisha, a region known for its tribal population, rich biodiversity, and growing importance in coffee cultivation. Located in the southern part of the state and forming a part of the Eastern Ghats, the district is characterized by hilly terrain, forested landscapes, and favourable agro-climatic conditions. The region receives an average annual rainfall of 1,300–1,600 mm, making it suitable for the cultivation of shade-grown Arabica coffee.

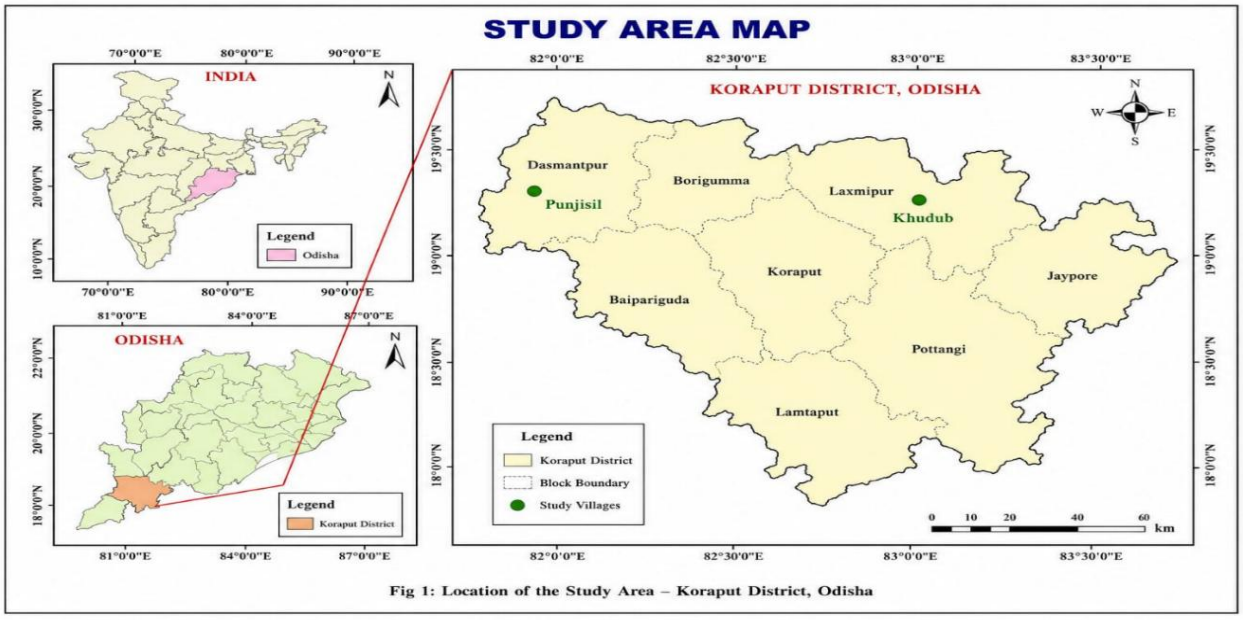


Fig 1: Location of the Study Area – Koraput District, Odisha

Figure of study area

Agriculture is the primary livelihood activity in the Koraput district, particularly among tribal communities. In recent years, coffee cultivation has emerged as an important source of income and livelihood diversification. The recognition of Koraput Coffee with a Geographical Indication (GI)

tag in 2019 further enhanced the district's reputation as a coffee-producing region. Coffee cultivation is concentrated in blocks such as Nandapur, Laxmipur, Dasmantpur, and Semiliguda, where many tribal farmers are engaged in coffee farming.

Despite its potential, coffee cultivation in the district faces several challenges, including inadequate infrastructure, limited market access, water scarcity, pest and disease management issues, and insufficient technical support. At the same time, increasing demand for organic and sustainably produced coffee provides opportunities for improving farmers' livelihoods and promoting sustainable agricultural practices.For the present study, two coffee-growing villages, Punjisil and Khudub, were selected from Koraput district. These villages were chosen to examine the challenges and opportunities associated with sustainable coffee farming and to compare the experiences of coffee farmers under different socio-economic and institutional conditions.

V. METHODOLOGY

The present study follows a qualitative and descriptive research methodology, supported by both primary and secondary data. The research was carried out through field visits and direct interaction with coffee farmers in two selected blocks of Koraput district—Dasmantpur and Nandapur. One village from each block was chosen for in-depth analysis: Punjisil (Dasmantpur) and Khudub (Nandapur). The study mainly focuses on comparison the challenges and opportunities faced by farmers in these two contrasting settings.

VI. RESULTS AND DISCUSSION

The following section presents the major findings of the study on sustainable coffee farming in Punjisil and Khudub villages of Koraput district. It highlights the socio-economic profile of coffee farmers, the challenges faced in coffee cultivation, available prospects, and the role of support systems in promoting sustainable farming practices. The findings are discoursed using both quantitative and qualitative evidence to compare the experiences of farmers across the two villages and to understand the factors influencing the sustainability of coffee cultivation in the region.

Total Amount of Coffee Workers in Koraput District

Figure- 1.1 People Engaged in Coffee Farming from Koraput District

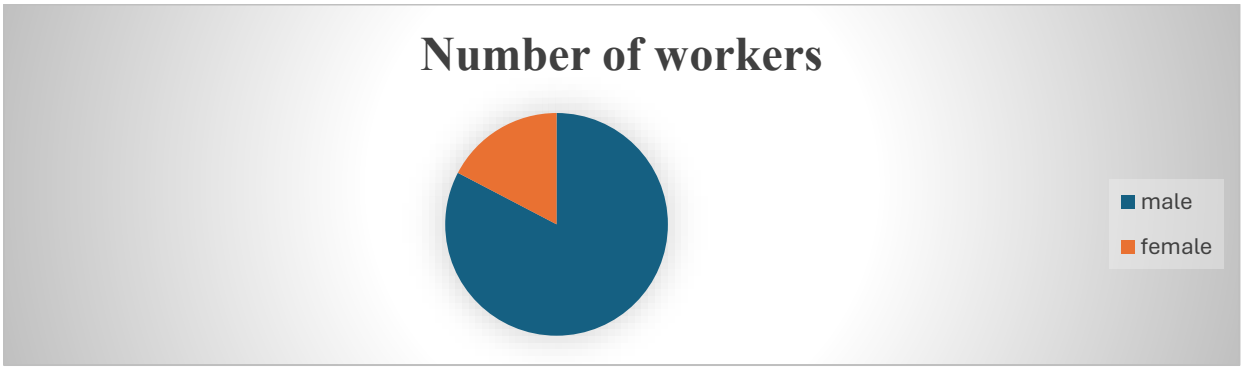
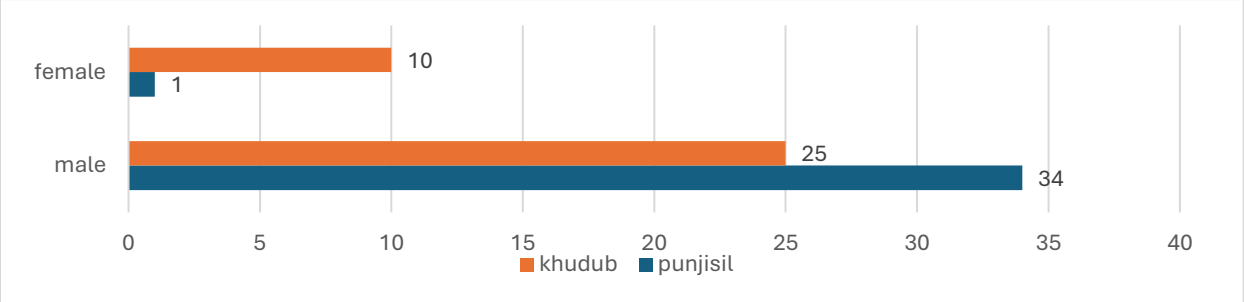


figure 1.1. describe that in Koraput district, a total of 1,050 people is engaged in coffee farming. Out of these, 858 are male with blue shade colour and 180 are female with orange shade colour, highlighting a substantial gender disparity in the workforce. This gender imbalance indicates that coffee farming in Koraput is mainly male-driven, with limited female participation. Such insights are essential when examining the broader theme of "Sustainable Coffee Farming in Koraput: Challenges and Opportunities for Coffee Farmers." Understanding the structure of the workforce allows for a deeper analysis of whether training programs, government support, and farming technologies are equally accessible to both men and women. Promoting greater inclusion of women could be a key opportunity in making coffee farming more equitable and sustainable in the region.

Number Of Male and Female Coffee Workers in Both Villages

Figure- 1.2 Male and Female participation in farming coffee in both village



In the above figure1.2 it shows that in Punjisil, there are 34 male coffee workers and only 1 female, which clearly reflects a male-dominated workforce. In contrast, Khudub has 25 male and a relatively higher number of 10 female workers. Although men still make up the majority in both villages, Khudub shows a more inclusive pattern of participation compared to Punjisil. The above bar chart provides a graphic comparison of this gender participation the work. While the male workers levels in both villages appear more as compared to female, which shows the male dominance in the workforce.

Average Yearly Income from Coffee

1.1. Table: Average Income of Coffee Workers

VILLAGE	AVERAGE COFFEE INCOME	MINIMUM	MAXIMUM
PUNJISIL	25000	7000	80000
KHUDUB	24000	2500	70000

1- AVERAGE INCOME FROM COFFEE 2- MINIMUM INCOME 3- MAXIMUM INCOME

Table 1.1. displays the average, minimum, and maximum yearly income earned from coffee farming in the two study villages- Punjisil and Khudub. In Punjisil, the average income is ₹25,000, with a minimum income of ₹7,000 and a maximum income of ₹80,000. In Khudub, the average income is slightly lower at ₹24,000, with a minimum income of ₹2,500 and a maximum income

of ₹70,000. The above bar chart provides a graphic comparison of these values. While the income levels in both villages appear close, the higher minimum and maximum income levels in Punjisil suggest a more stable and possibly supportive market environment.

This difference can be attributed to the presence of government support in Punjisil, where farmers have access to fixed prices and occasionally benefit from additional schemes. On the other hand, Khudub lacks steady government or private market support. Although private buyers do occasionally visit, their irregular presence forces many farmers to sell their produce at lower prices, resulting in income losses and financial instability.

Average Expenditure on Pesticides Annually

1.2. Table: Expenditure on Pesticides by both Villagers

VILLAGE	AVERAGE EXPENDITURE ON PESTICIDE
PUNJISIL	GIVEN BY GOVERMENT
KHUDUB	4060

The table 1.2. shows the average annual expenditure on pesticides in the two villages you studied—Punjisil and Khudub. In Punjisil, farmers do not bear any pesticide cost, as the pesticides are providing by the government. This support can be seen as a direct form of support that reduces financial burden and encourages better pest management practices. On the other hand, in Khudub, farmers spend an average of ₹4,060 per year on pesticides from their own pockets, which increases their input costs and affects their overall profit margins.This difference clearly highlights how government support plays a crucial role in promoting sustainability. Farmers in Punjisil benefit from reduced costs, while those in Khudub face financial pressure.

No Storage Facility

1.3. Table: Storage facility of both villages

VILLAGE	STORAGE FACILITY AVAILABLE OR NOT (YES/NO)
PUNJISIL	NO
KHUDUB	NO

As per the table data 1.3. it clearly showing that both the village punjisil and khudub has no storage facility. They have to use their own staying place as their storage. Due to lack of storage facility, they bound to sell their coffee at lower price because without storage it's difficult for them to manage it for long duration.

VII. LIMITATION

The study is subject to certain limitations. First, the research was confined to two coffee-growing villages, namely Punjisil and Khudub, in Koraput district. Therefore, the findings may not fully represent the experiences of all coffee farmers in the district or other coffee-growing regions.

Second, the study relied primarily on data provided by the respondents, which may be influenced by personal perceptions and recall bias. Third, due to time and resource constraints, the sample size was limited, restricting the scope of wider generalization. Finally, factors such as market price fluctuations, climatic conditions, and policy changes may affect coffee farming outcomes over time, but these dynamic aspects could not be examined in detail within the scope of the present study.

VIII. CONCLUSION

The study on sustainable coffee farming in Koraput highlights the opportunities and challenges faced by tribal coffee farmers in the selected villages of Punjisil and Khudub. The findings reveal significant differences in market access, institutional support, and income opportunities between the two villages. While some farmers benefit from better marketing channels and support systems, others continue to face constraints related to pricing, infrastructure, water availability, pest management, and limited access to extension services. Despite these challenges, coffee cultivation has considerable potential as a sustainable livelihood option in Koraput due to the region's favourable agro-climatic conditions and growing recognition of Koraput coffee. The study suggests that improved market access, fair pricing mechanisms, improved technical support, and stronger institutional interventions are essential for promoting sustainable coffee farming. Greater collaboration among government agencies, farmer groups, and other stakeholders can help address existing constraints and improve the socio-economic conditions of tribal coffee farmers.

In conclusion, sustainable coffee farming can play an important role in enhancing rural livelihoods, promoting environmental sustainability, and supporting the economic development of tribal communities in Koraput. With suitable policy support and localized interventions, the region has the potential to emerge as a successful model of sustainable coffee cultivation.

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