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Determinants of adoption of forest-based livelihood practices among tribal farmers in anuppur district, Madhya Pradesh

¹Dharmendra Pratap Prajapati, ²Ashutosh Singh Rajpoot, ²Varsha Patel, ²Kavita, ²Ranjana Janbandhu, ³Chanchlesh Yaduwanshi, ⁴Upasna Digarse, ¹Nihal Nagre, ¹Mohit Sisodiya and ¹Ajay Sharma

¹M.Sc. Research Scholar, School of Studies in Agricultural Sciences, SMVV, Ujjain, Madhya Pradesh, India

²Visiting Faculty, School of Studies in Agricultural Sciences, SMVV, Ujjain, Madhya Pradesh, India

³Guest Faculty, Madhav Vigyan Mahavidyalaya (MVM), Ujjain, Madhya Pradesh, India

⁴Ph.D. Scholar, JNKVV, Jabalpur, Madhya Pradesh, India

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Corresponding Author: Ashutosh Singh Rajpoot

Abstract

India hosts the world's largest tribal population, largely dependent on agriculture and forest-based livelihoods. Due to marginal landholdings and low productivity, Non-Timber Forest Products significantly support income. Understanding factors influencing adoption of forest-based livelihoods is essential for sustainable development. Correlation analysis showed that education, knowledge, economic motivation, resource use, income, market orientation, social participation, and cosmopolitaness significantly influence adoption of forest-based livelihood practices, while age, gender, landholding, occupation, and attitude showed no significant effect.

Keywords: Tribal, livelihood, forest, adoption

1. Introduction

The term "Tribe" originates from the Latin word *Tribus*, meaning a social group composed of several families, clans, or generations that share common languages, customs, and beliefs (Srivani *et al.*, 2022a) ^[16]. A tribe is generally defined as a social unit consisting of a group of families that share a common name, live within the same geographic area, speak a common language, and follow specific social norms or taboos related to marriage, occupation, or profession (Payasi *et al.*, 2023) ^[12].

Globally, approximately 370 million tribal people live across more than 70 countries, with India hosting the largest tribal population in the world (Census, 2011) ^[6]. In India, the tribal population is 10.43 crore, constituting 8.6% of the total population (Census, 2011) ^[6]. These Scheduled Tribes (STs) are predominantly located in forested and hilly regions of the country and are distinguished from other communities by their unique characteristics, including traditional lifestyles, geographic isolation, limited social interaction, and persistent educational and economic disadvantages, which have historically contributed to their marginalization.

Tribal communities occupy nearly 15 percent of India's geographical area and live across diverse ecological and geo-climatic zones, ranging from fertile plains and dense forests to rugged hills and remote, inaccessible regions. Consequently, tribal groups exhibit varying levels of social, economic, and educational development, reflecting the complex and multifaceted nature of their cultural evolution

and contemporary challenges (Rajpoot AS. *at al.* 2023) ^[14]. Madhya Pradesh has the largest proportion of tribal population among all Indian states, with Scheduled Tribes constituting 21.10% of the state's total population approximately 15.31 million individuals (Census, 2011) ^[6]. The state is home to 46 recognized tribes, among which the Bhil community is the most populous, accounting for 37.70% of the total tribal population.

Within this context, Anuppur district is a prominent tribal region, where 358,543 individuals representing 47.86% of the district's total population belong to Scheduled Tribes (Census, 2011) ^[6]. Among them, the Gond and Kol tribes together constitute 22%, while the Baiga tribe accounts for 20%, collectively representing nearly half of the district's tribal population.

Conceptually, the term *livelihood* refers to a comprehensive framework that encompasses the means, activities, entitlements, and assets through which individuals or communities secure their sustenance and fulfil their economic and consumption needs. In tribal communities of India, agriculture serves as the primary source of livelihood; however, due to marginal landholdings, low productivity, and multiple systemic constraints, agriculture alone is often insufficient to sustain household needs. Consequently, tribal families increasingly rely on forest-based livelihood practices to support their livelihoods.

Forest products, classified as timber and non-timber forest products (NTFPs), are abundant resources that significantly support the livelihoods of communities residing in and

around forest areas. While these products are used for both household consumption and income generation (Fisher, 2000), the forestry sector contributes about 1.7% to India's GDP. NTFPs include all non-timber biological materials with economic, nutritional, utilitarian, or cultural value, such as plant parts, fungi, and other forest-derived biotic resources (Singh *et al.* 2023) ^[14]. In India, NTFPs provide nearly 50% of the total household income for 20-30% of rural and forest-dependent populations, highlighting their critical role in livelihood security. Therefore, examining the relationship between adoption of forest-based livelihood practices and profile characteristics of tribal farmers is essential.

1.1 Research questions

What are the major factors influencing the adoption of forest-based livelihood practices?

1.2 Objective of the study

To access the relationship between adoption of forest-based livelihood practices and profile characteristics of tribal farmers.

1.3 Importance of the study

The findings of the present study are expected to offer valuable insights into the adoption behaviour of tribal farmers with respect to forest-based livelihood practices in Anuppur district of Madhya Pradesh, by generating comprehensive data on a range of variables encompassing the socio-personal, economic, psychological, situational, and communicational characteristics of the tribal population.

1.4 Limitations of the study

The present investigation was undertaken by a single student within a constrained timeframe, operating under limited financial support and resource availability; consequently, the study was conducted in a purposively selected area with a restricted sample size and confined to a specific geographical location, thereby limiting the

generalizability of the findings to broader populations.

2. Review of Literature

Thondhlana and Muchapondwa (2021) ^[17] collectively established that age exhibited a significant and positive relationship with the extent of adoption of forest-based livelihood practices among tribal communities.

Jha and Jha (2021) ^[18] found that respondents' favorable attitudes toward lac cultivation had a significantly positive influence on their adoption of improved, modern technologies related to lac production.

Masozera and Alavalapati observed that male respondents were more likely than their female counterparts to rely heavily on forests and other environmental resources for their livelihoods.

Adedayo and Oluronke (2023) ^[1] identified a statistically significant association between the educational qualifications of respondents and their level of adoption of agroforestry practices.

Nagesha and Gangadharappa (2023) ^[11] reported that variables such as landholding size, annual income, and social participation had a positive and significant correlation with the adoption of agroforestry systems in Karnataka.

Chaudhary and Panjabi (2005) ^[3] revealed a significant and positive relationship between the occupational status of both tribal and non-tribal farmers and their adoption behaviour regarding improved social forestry practices.

3. Material and Methods

3.1 Location of the study

The study was administered in the Anuppur District of Madhya Pradesh which is geographically located at 22.42°N and 72.54°E, in the central of India. The investigation was carried out in 2024-25.

3.1.1 Sampling Procedure: Multistage sampling procedure was used for the present Study.

3.2 Selection of Division

Table 1: List of Division with their tribal population

S. No.	Division	Tribal Population (%)	S. No.	Division	Tribal Population (%)
1	Jabalpur	21.86	6	Ujjain	9.61
2	Indore	29.95	7	Sagar	4.42
3	Bhopal	13.93	8	Chambal	0.54
4	Gwalior	4.63	9	Narmadapuram	14.92
5	Rewa	13.19	10	Shahdol	44.65

(Source: <https://mp.census.gov.in>).

The state M.P. is divided into 10 division as Jabalpur, Indore, Bhopal, Gwalior, Rewa, Ujjain, Sagar, Chamnal, Narmadapuram and Shahdol. Out of these Shahdol division was selected because of it constitutes 44.65 per cent tribes (Source: <https://mp.census.gov.in> 2011) to its total population in the division (Given in table 1) and researcher was familiar with the local languages and area.

3.2.1 Selection of the District

There are 3 districts in Shahdol division as Anuppur, Shahdol and Umaria. Out of which the Anuppur district was selected purposively because the district consisting 47.86%

tribes to its total population which is maximum among all three district of the division. (Source: <https://mp.census.gov.in> 2011). Apart from this the district is rich in forest produce, natural resources, and the prevalence of traditional knowledge-based practices.

3.2.2 Selection of the Block

Anuppur district is divided into four blocks: Anuppur, Kotma, Jaithari, and Pushprajgarh. Out of these Pusprajgad block was selected because it has maximum number of tribal populations among existing blocks (Given in table 2).

Table 2: List of blocks of Anuppur district with their total tribal population

S. No.	Block Name	Tribal Population	S. No.	Block Name	Tribal Population
1	Annupur	63,000	3	Jaithari	52,000
2	Kotma	47,000	4	Pushprajgad	1,05,000

(Source: <https://anuppur.nic.in>)**3.2.3 Selection of Villages**

Pusprajgad block consists 273 villages. To select the villages 10 per cent proportionate random sampling method

were applied. Thus total 27 villages were selected randomly for the study. The selected villages from Pushprajgarh blocks was presented (Given table 3)

Table 3: List of selected Villages for respondents' selection

S. No.	Name of Villages	S. No.	Name of Villages	S. No.	Name of Villages
1.	Chandaniya	2.	Bharni	3.	Dhanpuri
4.	Payari	5.	Jamkachhar	6.	Kohka
7.	Goratola	8.	Bijauri	9.	Basaniha
10.	Patthaiti	11.	Lalpur	12.	Tali
13.	Badhar	14.	Kirgi	15.	Lakhaura
16.	Dharamdash	17.	Mohadi	18.	Bhundakona
19.	Dauniya	20.	Bhamariya	21.	Girari Khurd
22.	Achalpur	23.	Pamra	24.	Nangmala
25.	Medhakhar	26.	Podaki	27.	Harshwah

3.2.4 Selection of Respondents

From the selected villages, 5 tribal farmers were selected by using simple random sampling method. Thus, the total sample size comprised of 135 tribal farmers, for the study.

Tribal farmers were treated as respondents.

4. Result and Discussion**Table 4:** Coefficient of correlation between characteristics of tribal farmers and their adoption of forest-based livelihood practices

S. No.	Variables	Correlation coefficient ("r")
1.	Age	0.141 ^{NS}
2.	Gender	-0.019 ^{NS}
3.	Education	-0.247 ^{**}
4.	Annual income	0.162 [*]
5.	Land holding	0.073 ^{NS}
6.	Occupation	0.048 ^{NS}
7.	Income from forest practices	0.214 [*]
8.	Attitude towards forest-based livelihood practices	0.139 ^{NS}
9.	Knowledge about forest-based livelihood practices	0.228 ^{**}
10.	Market orientation	0.194 [*]
11.	Economic motivation	0.267 ^{**}
12.	Utilization of forest-based resources	0.355 ^{**}
13.	Social participation	0.179 [*]
14.	Cosmopolitenss	0.173 [*]

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The coefficient of correlation (r) was worked out and given in table 4, to ascertain the relationship between the adoption of forest based livelihood practices and profile characteristics of the tribal farmers.

4.1 Age (r = 0.141^{NS})

A low positive but non-significant correlation was observed between age and the adoption of forest-based livelihood practices, indicating that age has minimal influence on adoption behavior among tribal farmers. The slight positive tendency may be due to middle-aged and older farmers perceiving forest extraction as a sustainable livelihood option, as supported by Fonta and Ayuk (2021)^[4].

4.2 Gender (r = -0.019^{NS})

Gender showed a non-significant relationship with the adoption of forest-based livelihood practices, suggesting

that both men and women participate in these activities at comparable levels. This finding is consistent with Masozera and Alavalapati.

4.3 Education (r = -0.247)

Education exhibited a significant negative correlation at the 1% level, indicating that higher educational attainment decreases the likelihood of adopting forest-based livelihood practices. Educated individuals may seek alternative employment opportunities outside the forest-based sector. Similar results were reported by Rajpoot *et al.* (2023)^[14].

4.4 Annual Income (r = 0.162)

Annual income showed a positive and significant correlation at the 5% level, implying that higher financial capital enhances the adoption of forest-based livelihood practices. Similar findings were reported by Nagesha and

Gangadharappa (2023)^[11].

4.5 Land Holding ($r = 0.073^{NS}$)

Land holding exhibited a positive but non-significant relationship with adoption. This may be attributed to the fact that most tribal households possess marginal landholdings, limiting agricultural viability. Comparable observations were made by Madiwalar *et al.* (2017)^[10] and Nagesha and Gangadharappa (2023)^[11].

4.6 Occupation ($r = 0.048^{NS}$)

Occupation showed a positive but non-significant correlation, suggesting that adoption is not influenced by primary occupation. Many tribal farmers are marginal or landless and therefore depend on forest resources for seasonal livelihood support. Similar results were reported by Chaudhary and Panjabi (2005)^[3].

4.7 Income from Forest Practices ($r = 0.214$)

Income derived from forest activities exhibited a positive and significant correlation at the 5% level, indicating that households already earning from forest resources are more likely to adopt forest-based livelihood practices. Similar results were reported by Rajpoot *et al.* (2023)^[14].

4.8 Attitude towards forest -based livelihood practices ($r = 0.139^{NS}$)

Attitude towards forest-based livelihood practices showed a positive but non-significant relationship, implying that although favorable attitudes exist, they do not necessarily translate into adoption behavior. Similar results were observed by Islam *et al.* (2018)^[7].

4.9 Knowledge about forest -based livelihood practices ($r = 0.228$)

Knowledge of forest-based livelihood practices showed a positive and highly significant correlation at the 1% level, indicating that improved knowledge enhances adoption. Increased awareness of nursery operations, plantation management, harvesting, and value addition enables better returns from forest products. Similar results were observed by Islam *et al.* (2018)^[7].

4.10 Market Orientation ($r = 0.194$)

Market orientation exhibited a positive and significant correlation at the 5% level. Better market access encourages forest resource utilization for income generation, leading to greater adoption of forest-based practices. Similar results were observed by Urvashi *et al.* 2025^[18].

4.11 Economic Motivation ($r = 0.267$)

Economic motivation showed a positive and highly significant relationship at the 1% level. Tribal farmers with a higher desire for profit maximization are more likely to adopt forest-based livelihood practices. Similar results were observed by Urvashi *et al.* 2025^[18].

4.12 Utilization of forest-based resources ($r = 0.355$)

Utilization of forest resources demonstrated a positive and highly significant relationship at the 1% level. Forest resources contribute directly to income, employment, subsistence needs, and cottage-based enterprises, thereby

increasing adoption. Similar findings were reported by Kandwal (2018)^[9].

4.13 Social Participation ($r = 0.179$)

Social participation showed a positive and significant correlation at the 5% level, suggesting that participation in community groups facilitates information sharing and encourages adoption. This aligns with findings by Prakash and Sharma (2018)^[13].

4.14 Cosmopolitaness ($r = 0.173$)

Cosmopolitaness was positively and significantly correlated at the 5% level. Farmers with greater external exposure, through visits to markets or towns, are more likely to adopt forest-based livelihood practices. This aligns with findings by Nagesha and Gangadharappa (2023)^[11].

5. Conclusion

The correlation analysis reveals that nine independent variables have shown a significant relationship with the dependent variable forest-based livelihood practices. Education, knowledge about forest-based livelihood practices, economic motivation, and utilization of forest-based resources exhibited a positive and highly significant correlation at the 1% level, indicating that higher education, better knowledge, strong economic motivation, and greater utilization of forest resources contribute substantially to increased engagement in forest-based livelihood practices. Additionally, annual income, income from forest practices, market orientation, social participation, and cosmopolitaness were found to have a positive and significant correlation at the 5% level, implying that better financial status, higher income from forest-related activities, market awareness, community involvement, and wider social exposure also play an important role in adoption of forest based livelihood practices by tribal farmer of Anuppur district.

However, age, gender, land holding, occupation, and attitude towards forest-based livelihood practices showed non-significant relationships, suggesting that these variables do not directly influence farmers' engagement in forest-based livelihood activities within the studied context.

Overall, the findings suggest that socio-economic characteristics such as education, income sources, motivation, resource utilization, and social connectivity are key determinants influencing the adoption and engagement in forest-based livelihood practices.

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