

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(9): 181-184
www.biochemjournal.com
Received: 03-07-2026
Accepted: 05-08-2026

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Contribution of non-timber forest products (NTFPs) to rural livelihoods and rural economy

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DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i9Sc.9823>

Abstract

Non-Timber Forest Products (NTFPs) are an important source of income, employment and livelihood support for rural households living near forests. Previous studies have shown that NTFPs contribute to household cash income and provide an important livelihood option, particularly for households with limited agricultural resources (Mahapatra *et al.*, 2005; Belcher *et al.*, 2005) [4, 1]. The present study was conducted to assess the contribution of major NTFPs to rural livelihoods and the rural economy in the selected villages of Titirgaon, Baalikonta and Kaalipur. Primary data were collected from 50 households through household interviews, field observations and discussions with respondents. The study examined landholding pattern, quantity collected, collection cost, selling price, gross income, net income, employment generation and benefit-cost ratio of five major NTFPs, namely Salfi, Tamarind, Mahua flower, Tendu leaves and Karanj seed. The results showed that marginal and small farmers constituted 78% of the sampled households. Salfi generated the highest gross income of ₹21,902.10 and net income of ₹17,142.10 per household, followed by Tamarind with gross income of ₹11,899.23 and net income of ₹8,159.23. The total gross income from the five NTFPs was ₹42,196, while total collection expenditure was ₹13,430, resulting in a net income of ₹28,766 per household. The activities generated 265 person-days of employment. Salfi recorded the highest gross benefit-cost ratio of 4.60, whereas Karanj seed recorded the lowest at 1.04. The findings indicate that NTFPs provide an important supplementary source of household income and seasonal employment. Strengthening market access, value addition, collective marketing and sustainable harvesting practices could further improve the livelihood benefits of NTFPs (Belcher & Schreckenberg, 2007; Shackleton *et al.*, 2015) [2, 5].

Keywords: NTFPs, rural livelihood, forest products, household income, employment, value addition, sustainable harvesting

Introduction

Forests provide a wide range of products and services that support the livelihoods of rural communities. In addition to timber, forests provide fruits, flowers, seeds, leaves, medicinal plants, gums and other biological materials commonly referred to as Non-Timber Forest Products (NTFPs) (Belcher *et al.*, 2005) [1]. These products are particularly important for households that have limited agricultural land and fewer employment opportunities. NTFPs collection contributes to rural livelihoods through cash income, food supply and seasonal employment. Mahapatra *et al.* (2005) [4] found that NTFP sales contributed to the cash income of rural households living in dry deciduous forest regions of India. Their study also demonstrated that the contribution of NTFPs differs according to ecological conditions, seasons and household characteristics. For many rural households, forest collection becomes particularly important during periods when agricultural employment is limited. Thus, NTFPs can act as a supplementary source of income and help households diversify their livelihood activities (Mahapatra *et al.*, 2005) [4]. However, the economic benefits of NTFPs depend on several factors, including availability of forest resources, collection costs, product prices, market access and the bargaining position of collectors. Poor access to markets and dependence on intermediaries may reduce the share of final value received by collectors (Belcher & Schreckenberg, 2007) [2]. Commercialization of NTFPs can create opportunities for income enhancement, but commercialization alone does not guarantee improved livelihoods or conservation.

Belcher and Schreckenberg (2007) ^[2] emphasized the importance of value-chain development, product quality, market organization and sustainable resource management. Chhattisgarh is an important state for minor forest produce collection and marketing. The Chhattisgarh State Minor Forest Produce Federation operates mechanisms for procurement and marketing of minor forest produce and promotes processing, value addition and sustainable utilization. The official state federation reports MSP rates

for several products. For the 2024–25 collection year, the listed rates include ₹36/kg for Tamarind with seeds, ₹33/kg for dry Mahua flower and ₹24/kg for Karanj seed, including the applicable state incentive where specified. Therefore, understanding the actual household-level costs and returns from NTFP collection is important for designing policies that improve rural incomes while ensuring sustainable use of forest resources.



Fig 1: Data collection at selected villages

2. Materials and methods

2.1 Study area

The study was conducted in three selected forest-fringe villages, namely Titirgaon, Baalikonta and Kaalipur under NSS programme. These villages were selected purposively because households in the area participate in forest-product collection. The selection of forest-dependent households is appropriate for NTFP livelihood studies because access to forest resources can influence household income and livelihood diversification (Mahapatra *et al.*, 2005) ^[4].

2.2 Sampling

A total of 50 households were selected for the study. Respondents were categorized according to agricultural landholding size.

2.3 Data collection

Primary information was collected through:

- Household interviews;
- field observations;
- Discussions with respondents; and
- Information collected during NTFP harvesting periods.

Information was collected on quantity harvested, collection cost, selling price, gross income, net income, employment days and working hours.

2.4 Data analysis

- Gross income was calculated as:
- Gross income = Quantity collected × Selling price
- Net income was calculated as:
- Net income = Gross income – Collection cost
- The benefit-cost ratio was calculated as:
- B:C ratio = Gross income / Collection cost

The employment generated was measured in person-days. The analytical approach is consistent with previous

household-level studies examining the contribution of NTFPs to rural income (Mahapatra *et al.*, 2005) ^[4].



Fig 2: Survey at village

3. Results and discussion

3.1 Landholding pattern

Table 1: Distribution of Respondents According to Landholding

S. No.	Land holding category	Households	Percentage
1	Marginal (<2.5 acres)	25	50.0
2	Small (2.6–5.0 acres)	14	28.0
3	Medium (5.1–10.0 acres)	8	16.0
4	Large (>10 acres)	3	6.0
Total		50	100.0

Source: Primary survey data.

Half of the respondents were marginal farmers, while 28% were small farmers. Thus, 78% of the respondents belonged to marginal and small-farmer categories. This result indicates that most respondents possessed relatively limited agricultural land. Such households are more likely to depend on diversified livelihood activities, including forest-product collection. Similar relationships between household characteristics and NTFP dependence have been reported in Indian dry deciduous forest regions (Mahapatra *et al.*, 2005) ^[4].

3.2 Economic contribution of major NTFPs

Table 2: Cost, Return and Employment from Major NTFPs

NTFP	Quantity collected*	Cost (₹)	Selling price (₹)	Gross income (₹)	Employment days	Working hours/day	Net income (₹)	Gross B:C
Salfi(ltr)	398.22	4,760	55.00	21,902.10	90	7.50	17,142.10	4.60
Tamarind	348.44	3,740	34.15	11,899.23	45	5.71	8,159.23	3.18
Mahua flower	119.46	2,380	44.75	5,345.84	40	5.66	2,965.84	2.25
Tendu leaves	79.64	1,530	25.00	1,991.00	50	7.85	461.00	1.30
Karanj seed	49.78	1,020	21.25	1,057.83	40	4.58	37.83	1.04
Total	—	13,430	—	42,196.00	265	—	28,766.00	—

Source: Primary survey data. *Quantities are reported in the units supplied in the primary dataset; Salfi and the other products should not be aggregated into one physical unit.

3.3 Salfi

Salfi was the most economically important product in the study. It generated a gross income of ₹21,902.10 per household against a collection cost of ₹4,760, resulting in a net income of ₹17,142.10.

The gross B:C ratio was 4.60, which was the highest among the five NTFPs. Salfi also generated 90 person-days of employment, the highest employment contribution recorded in the study. The result indicates that Salfi has considerable potential as a livelihood-supporting forest product in the study area. However, increased commercialization should be accompanied by appropriate resource management because uncontrolled commercialization can create ecological and livelihood risks (Belcher & Schreckenberg, 2007) ^[2].

Source for numerical results: Primary survey data.

3.4 Tamarind

Tamarind generated a gross income of ₹11,899.23 and net income of ₹8,159.23 per household. The collection cost was ₹3,740, resulting in a gross B:C ratio of 3.18. Tamarind was therefore the second most important NTFP in terms of household income. The importance of Tamarind is also reflected in the institutional procurement system of Chhattisgarh. The state federation lists a 2024–25 MSP of ₹36/kg for Tamarind with seeds and ₹69/kg for seedless Tamarind. Improved grading, processing and marketing could further increase the value retained by collectors. Value-chain development is important for ensuring that commercialization generates meaningful livelihood benefits (Belcher & Schreckenberg, 2007) ^[2].

3.5 Mahua flower

Mahua flower generated a gross income of ₹5,345.84 and net income of ₹2,965.84 per household. The gross B:C ratio was 2.25. Mahua is an important minor forest produce in Chhattisgarh. The state federation lists dry Mahua flower at ₹30/kg MSP plus ₹3/kg incentive, giving a listed collection rate of ₹33/kg for the 2024–25 collection year. Better drying, grading, storage and processing could improve the market value of Mahua flower. NTFP value addition is particularly important because raw products often provide lower returns than processed products (Belcher & Schreckenberg, 2007) ^[2].

3.6 Tendu leaves

Tendu leaves generated gross income of ₹1,991 and net income of ₹461 per household. The gross B:C ratio was 1.30. Although the net financial return was comparatively low, Tendu leaves generated 50 employment days. This indicates that an NTFP can have an important employment role even when its direct net income contribution is relatively small. NTFPs can provide seasonal employment

and therefore contribute to livelihood diversification beyond their direct cash value (Mahapatra *et al.*, 2005) ^[4].

3.7 Karanj seed

Karanj seed generated gross income of ₹1,057.83 and net income of ₹37.83 per household. The gross B:C ratio was 1.04. This was the lowest-returning product among the five NTFPs. Nevertheless, collection generated 40 employment days. The Chhattisgarh State Minor Forest Produce Federation lists Karanj seed at ₹22/kg MSP plus ₹2/kg incentive, giving a listed collection rate of ₹24/kg for the 2024–25 collection year. The relatively low return observed in the survey suggests that additional research is needed on collection efficiency, market price, processing and value addition for Karanj seed.

3.8 Share of NTFPs in total gross income

Table 3: Contribution of Individual NTFPs to Gross Income

NTFP	Gross income (₹)	Share (%)
Salfi	21,902.10	51.91
Tamarind	11,899.23	28.20
Mahua flower	5,345.84	12.67
Tendu leaves	1,991.00	4.72
Karanj seed	1,057.83	2.51
Total	42,196.00	100.00

Source: Author's calculation from primary survey data.

Salfi accounted for the largest share of gross income (51.91%), followed by Tamarind (28.20%). Together, these two products contributed approximately 80.11% of total gross income. This concentration suggests that Salfi and Tamarind are the most promising products for targeted value-chain interventions in the study area. However, livelihood diversification should also be maintained to reduce dependence on individual products (Belcher & Schreckenberg, 2007) ^[2].

3.9 Employment generation

Table 4: Employment Generated by Major NTFPs

NTFP	Employment days	Share (%)
Salfi	90	33.96
Tamarind	45	16.98
Mahua flower	40	15.09
Tendu leaves	50	18.87
Karanj seed	40	15.09
Total	265	100.00

Source: Primary survey data.

The five NTFPs generated 265 person-days of employment. Salfi generated the highest employment, followed by Tendu leaves and Tamarind. The employment contribution of

NTFPs is important because collection can provide income-generating opportunities during periods of limited agricultural activity (Mahapatra *et al.*, 2005) ^[4].

3.10 Overall cost and return

- The combined gross income from the five NTFPs was ₹42,196 per household, while total collection cost was ₹13,430.
- Therefore: Net income = ₹42,196 – ₹13,430. Net income = ₹28,766 per household
- The overall gross B:C ratio was approximately:
- ₹42,196 / ₹13,430 = 3.14

Thus, the NTFP activities generated a positive overall economic return. However, considerable differences were observed among products. Salfi showed the highest return, whereas Karanj seed showed only a small surplus. These findings support the argument that NTFP development should be product-specific and should consider collection costs, market demand, processing opportunities and sustainability (Belcher & Schreckenberg, 2007) ^[2].

4. Conclusion

The study demonstrates that NTFPs make an important contribution to the livelihood and rural economy of the surveyed households in Titirgaon, Baalikonta and Kaalipur. The predominance of marginal and small farmers, accounting for 78% of the respondents, indicates that households with limited agricultural land use forest resources as an important supplementary livelihood source. Among the five NTFPs studied, Salfi was the most economically important, generating ₹21,902.10 gross income and ₹17,142.10 net income per household. Tamarind ranked second, generating ₹11,899.23 gross income and ₹8,159.23 net income. The five NTFPs together generated ₹42,196 gross income and ₹28,766 net income per household, while providing 265 person-days of employment. These results are consistent with previous Indian research showing that NTFP sales can contribute significantly to rural cash income and livelihood diversification (Mahapatra *et al.*, 2005) ^[4]. At the same time, commercialization should be managed carefully. Evidence from the wider NTFP literature shows that commercialization can improve livelihood opportunities but may also create ecological and socioeconomic risks if resource management and value-chain conditions are ignored (Belcher & Schreckenberg, 2007) ^[2].

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