



## FACTSHEET

# ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS IN TENDU PLUCKING

An evidence-based analysis for Jharkhand

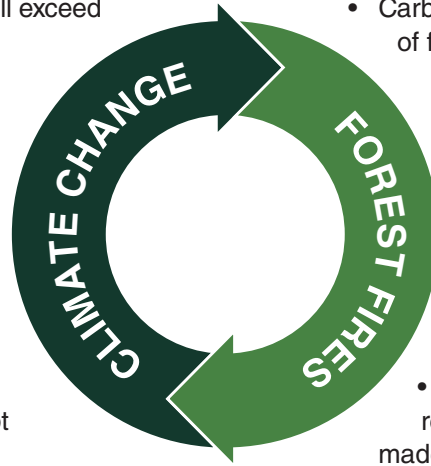
**iFOREST** | INTERNATIONAL FORUM FOR ENVIRONMENT, SUSTAINABILITY & TECHNOLOGY

The Union

International Union Against Tuberculosis and Lung Disease

## FOREST FIRES – A VITAL CONCERN FOR CLIMATE CHANGE

- Global temperature increase will exceed in the 21st century.
- Extreme weather events becoming more frequent and intense.
- Urgent, extensive mitigation & adaptation action required across sectors.
- Important role of forests & forest soil as natural carbon sinks – 7.2 bt of carbon stock held in Indian forests & 2.5-3 bt planned to be added.



- Carbon sequestration benefits of forests threatened by rising degradation/ forest fires.
- 29.2% of Jharkhand's total forest cover extremely to moderately forest fire-prone.
- While tracking & alert systems have improved, control & management remains inadequate.
- Limited understanding of responsible factors (95% human-made), restricting focused action.



### EXPLORING THE TENDU & FOREST FIRE LINKAGE IS IMPORTANT

- A prominent NTFP in Jharkhand supported strongly by state machinery.
- Contributing significantly to revenues of FD agencies.

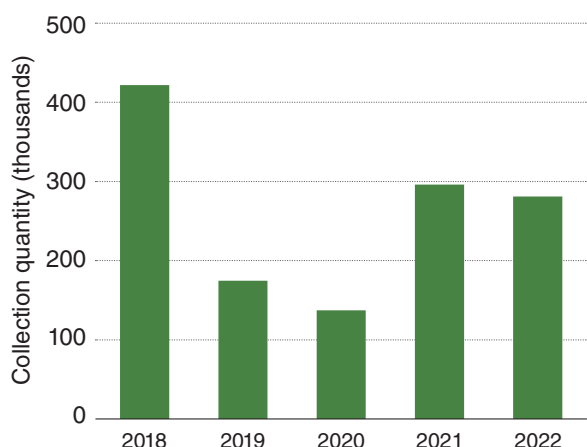
Significant contribution to forest health degradation. Forest fires are frequently reported in tendu and mahua prevalent areas.

Used primarily to manufacture bidis – estimated to cost the nation ₹800 billion in illnesses and early deaths.

## TENDU PRODUCTION IN JHARKHAND

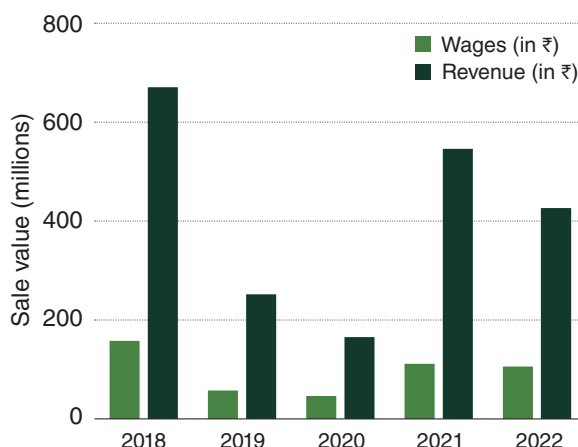
Jharkhand State Forest Development Corporation Ltd, a state public sector undertaking, is the nodal agency for the collection and trade of tendu leaves in the state. The collection of leaves is done by primary cooperatives at the panchayat level. In terms of the trends in collection, while there was a noticeable dip after 2018 (an exceptional year in terms of production), stakeholder interviews revealed that tendu collection has only been growing in recent years and that the trend is expected to continue.

**Tendu collection in Jharkhand (in SBs)**



Source: Jharkhand Forest Department, Jharkhand  
Note: 1 SB=50,000 leaves

**Revenue generated and collection income accrued to tendu collectors (in ₹)**



Source: Jharkhand Forest Department, Jharkhand

## iFOREST STUDY OBJECTIVE & APPROACH



- To establish the linkages between tendu leaf collection and forest fires and to assess the impact in terms of burnt area & emissions.
- To assess the scale of dependence upon tendu collection and its contribution towards the socio-economic well-being of the dependents.
- To outline the possible alternatives to tendu to enhance livelihood options for the tendu collecting communities.

### FOCUS ON JHARKHAND:

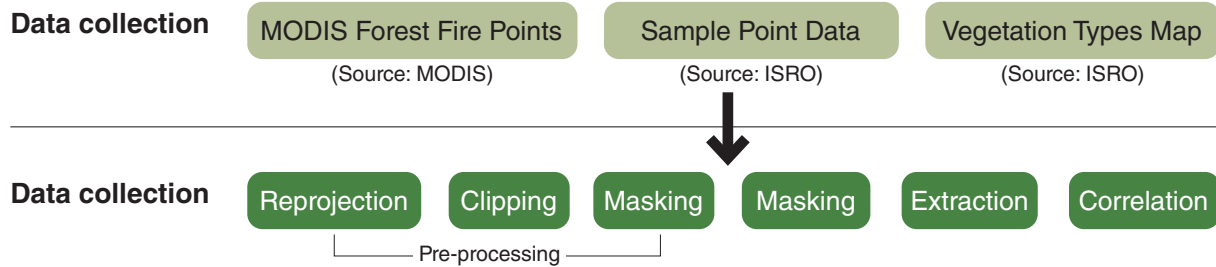
Eighth highest in the country in terms of incidences of forest fires.

Accounts for around 10% of the total tendu collection in the country.

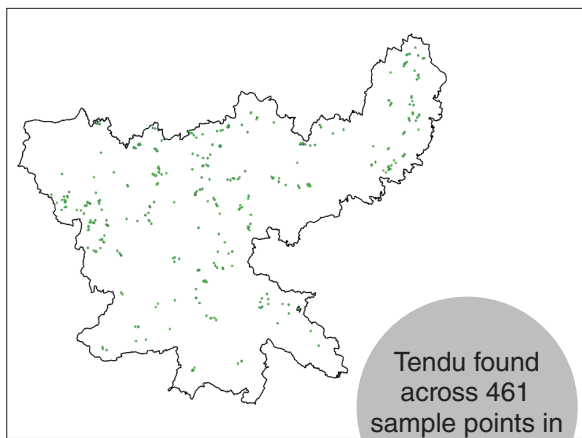


1. The utilisation of available satellite data on forest fires, vegetation type & emissions.
2. The utilisation of secondary and primary data. Focus Group Discussions (FGDs) and stakeholder interviews were conducted to get primary data.

# RESULT 1: SUBSTANTIAL OVERLAP IN TENDU AREAS & FOREST FIRE POINTS IN JHARKHAND

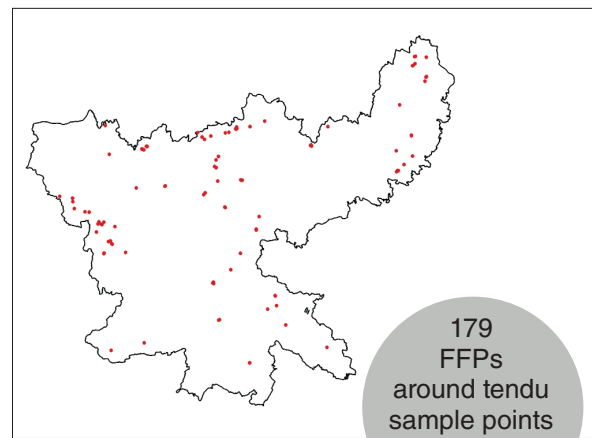


**Distribution of tendu sample points in Jharkhand**



Tendu found across 461 sample points in Jharkhand

**Distribution of tendu-linked forest fire points in Jharkhand**



179 FFPs around tendu sample points during 2011-2021

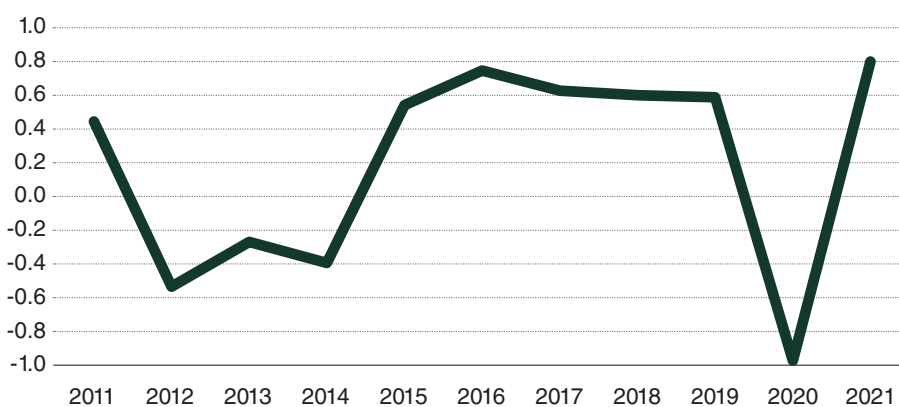
Source for forest fire points (FFPs): NASA's MODIS dataset

Source for tendu sample points: P.S. Roy, S.P.S. Kushwaha, M.S.R. Murthy, A. Roy, M.C. Porwal, et al. 2012. Biodiversity Characterization at Landscape Level: National Assessment. Indian Institute of Remote Sensing, ISRO, Dehradun, India, ISBN: 81-901418-8-0

The state showed varied trajectories during 2011-21. It showed a dip in forest fires during the mid-years of the study period and then a sudden increase afterwards. It decreased again in the year 2020 due to the nationwide Covid-19 lockdown. The forest fire incidences increased multiple folds after the 2020 lockdown period in the state.

# RESULT 2: STRONG POSITIVE CORRELATION EMERGING BETWEEN TENDU & FOREST FIRES

**Correlation between the FFPs and tendu locations during 2011-21**



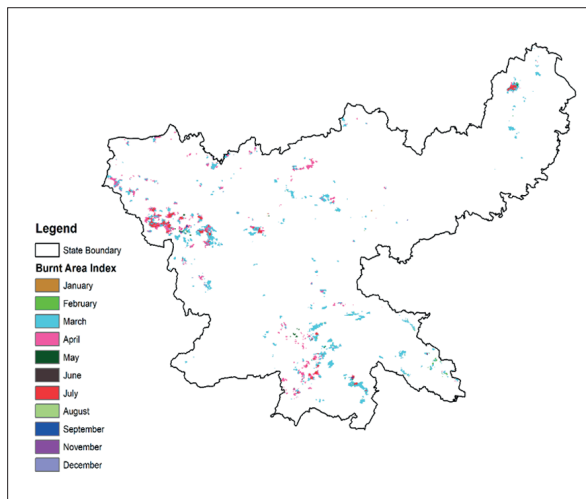
A correlation coefficient of 0.69 over the study period indicates that the tendu-producing areas appear to have a noticeable susceptibility to forest fires in Jharkhand.

## RESULT 3: TENDU-LINKED FIRES AFFECTING VAST TRACTS OF LAND

- Data from MODIS Burned Area Monthly Global; 500m resolution downloaded & clipped for 2011-21 for Jharkhand.
- Month-wise, state-wise BAI distribution calculated.

2,110 sq km

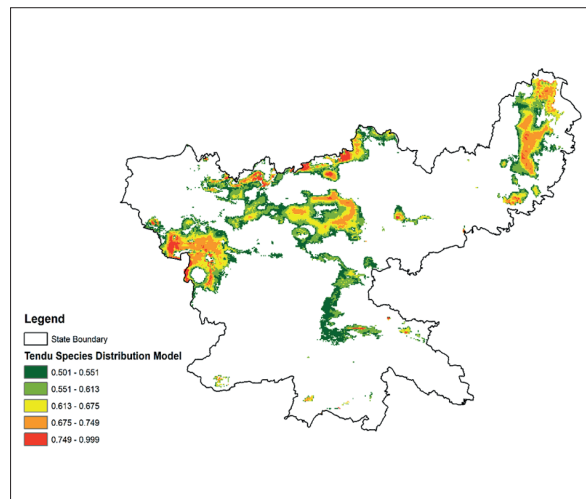
Burn Area Index during 2011-21



- Species distribution model developed using MaxEnt model, tendu sample points & bioclimatic data (WorldClim).
- ROC curve and Jack knife test of variable importance conducted.

16,054 sq km

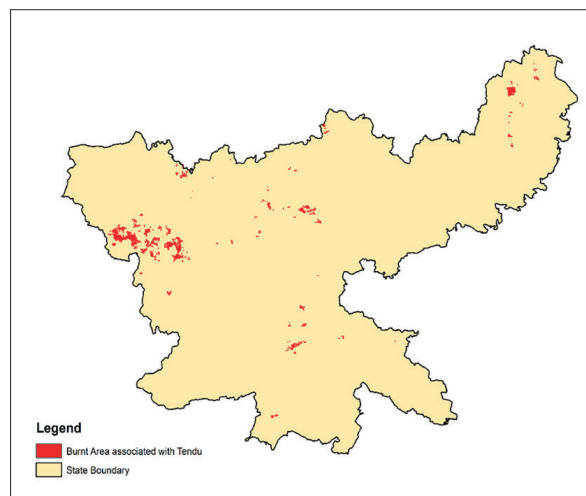
Potential species distribution of tendu



- Potential species distribution of tendu & BAI overlaid to calculate potential burnt area associated with tendu.

280 sq km

Burnt area with respect to potential tendu distribution for 2011-21

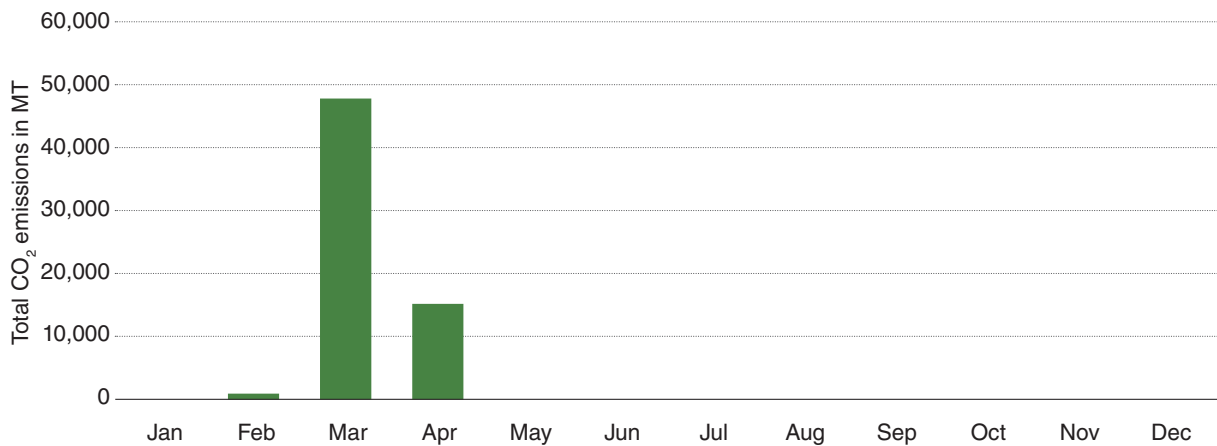


## RESULT 4: TENDU-LINKED FOREST FIRES CONTRIBUTING SIGNIFICANTLY TO EMISSIONS

**63,000 mt of CO<sub>2</sub> emissions dominated by tendu-related fires during 2021. Equivalent to the CO<sub>2</sub> emissions by 25,200 cars in a year**

**Data & Methodology:** CO emissions data from the TROPOMI on the Sentinel 5 Precursor (S5P) satellite, treated for background emissions, and clipped for tendu BAI for the state. CO<sub>2</sub> estimated assuming modified combustion efficiency for forest fires with smouldering combustion for dry deciduous type of forest.

### Estimated CO<sub>2</sub> emissions from tendu-linked forest fires in 2021



## RESULT 5: TENDU FOUND TO BE PROVIDING MARGINAL RETURNS TO COLLECTORS AND NOT ADDRESSING THE UNDERLYING POVERTY

FGDs with 18 tendu collectors in Jamuna and Deobar villages in the Latehar district were conducted to ascertain the dependence of people on the collection of tendu and other NTFPs. The aim was to also ascertain their perception of tendu collection as a source of livelihood and the potential role of other NTFPs in providing alternative sources of livelihood. The findings from the FGDs are detailed below.

**Tendu collectors from marginalised sections of society and dependence on tendu due to lack of other sources of income**

- Extremely impoverished and from marginalised sections of society.
- 72% of households from the Scheduled Tribes category.
- Average annual income of around ₹7,600.
- Dependent upon agriculture, however, have marginal landholdings.
- Average landholding of 0.58 acres.

**Tendu provides marginal returns but other NTFPs provide better sources of income**

- High dependence upon the forests due to its proximity to the villages.
- Average annual earnings of around ₹2,000 through 10 days of engagement.
- Average annual earnings of around ₹2,900 from the sale of other NTFPs like mahua and dori.

## CONCLUSIONS

### Economic dependence

- Tendu-collecting families are extremely impoverished, falling below the poverty line in both villages.
- There is a high dependence upon tendu due to a lack of income-generating opportunities during the lean summer months.
- The surveyed collectors received an average of ₹2,000 as collection wage for 10 days of collection which is not commensurate with the time and effort invested.
- The families earn more from the collection of other NTFPs in a year than they do from tendu. They suggested the promotion of other NTFPs like fruits, medicinal plants, chironji, karanj in lieu of tendu.
- The respondents expressed that other livelihood opportunities like that of animal husbandry should be promoted so that their dependence on tendu and other NTFPs is reduced.

### Environmental concerns with tendu plucking

- There is a noticeable positive correlation between forest fires and tendu prevalence in Jharkhand.
- The total burnt area due to forest fires in tendu occurring areas is estimated to be 280 sq km for the 2011-21 period.
- Tendu-related fires emitted 63,000 mt of CO<sub>2</sub> in Jharkhand in 2021.

## WAY FORWARD: ALTERNATIVE LIVELIHOODS

In light of the adverse environmental and health impacts of tendu leaf collection, and the persistent poverty among tendu collectors, there is a need to provide viable economic alternatives to the collectors.

### Four major pathways in the provision of alternative livelihoods:

#### 1 Promotion of non-tendu NTFP-based livelihoods

- Non-tendu NTFPs are widely collected and have better returns in some cases.
- Additional policies, robust organisational structures, resources, market linkages etc. needed.

#### 2 Tapping into agricultural schemes for the promotion of the agricultural sector

- Investing in and boosting agricultural productivity important to help move away from tendu collection.
- Convergence of state and central-level schemes for agriculture and allied sectors needed.

#### 3 Leveraging livelihood schemes and other available funds to promote employment generation

- Provision of alternative employment opportunities especially during lean agricultural months.
- Convergence of schemes/programmes/funds necessary. Example: MNREGA and CAMPA.

#### 4 Harnessing the potential of Payment for Ecosystem Services and carbon markets

- Generating income for tendu dependent communities.
- Promoting ecological conservation.

## ASSESSMENT OF KEY NTFPS AS TENDU ALTERNATIVES IN JHARKHAND

NTFP	Annual Production (approx. in MT)	Minimum Support Price (MSP)	Availability Period
Tamarind	50,000	22	February-May
Karanj	10,000	21	May-June
Sal seeds	More than 100,000	10	April-June
Chironji guthli	1,000	100	March-May
Honey	05-Oct	132	-
Palash	1,000		March-May
Mango pulp	500	60-70	May-June

Source: iFOREST assessment

Stakeholder consultations reveal that there are many NTFPs that can be promoted in the state. However, it is clear that alternatives need to be devised keeping in mind the season and areas in which these NTFPs are collected. The major problems identified as being roadblocks in the promotion of NTFPs in the state are as follows:

Poor conceptualisation and implementation of the MSP scheme

Lack of storage facilities

Lack of market linkages

Lack of processing opportunities

Lack of investment in R&D

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