

India State of Forest Report 2023

Why in News?

Recently, India State of Forest Report 2023 (ISFR 2023) has been released.

What is ISFR 2023 Report ?

- **ISFR Report** - India State of Forest Report is an in-depth assessment of the forest and tree resources of the country.
- **Author** - Forest Survey of India (FSI)
- **Period** - Biennial basis
- It is the 18th cycle of report since 1987.
- **Information Sources** - Remote Sensing satellite data and field based National Forest Inventory (NFI).
 - Satellite data gives forest cover
 - Satellite data period - October 2021 to December 2021
 - NFI provides Growing Stock and Carbon.
 - NFI assessment is 2017-22.

FSI launched a National Forest Inventory in 2002, with the onset of the 10th five-year plan.

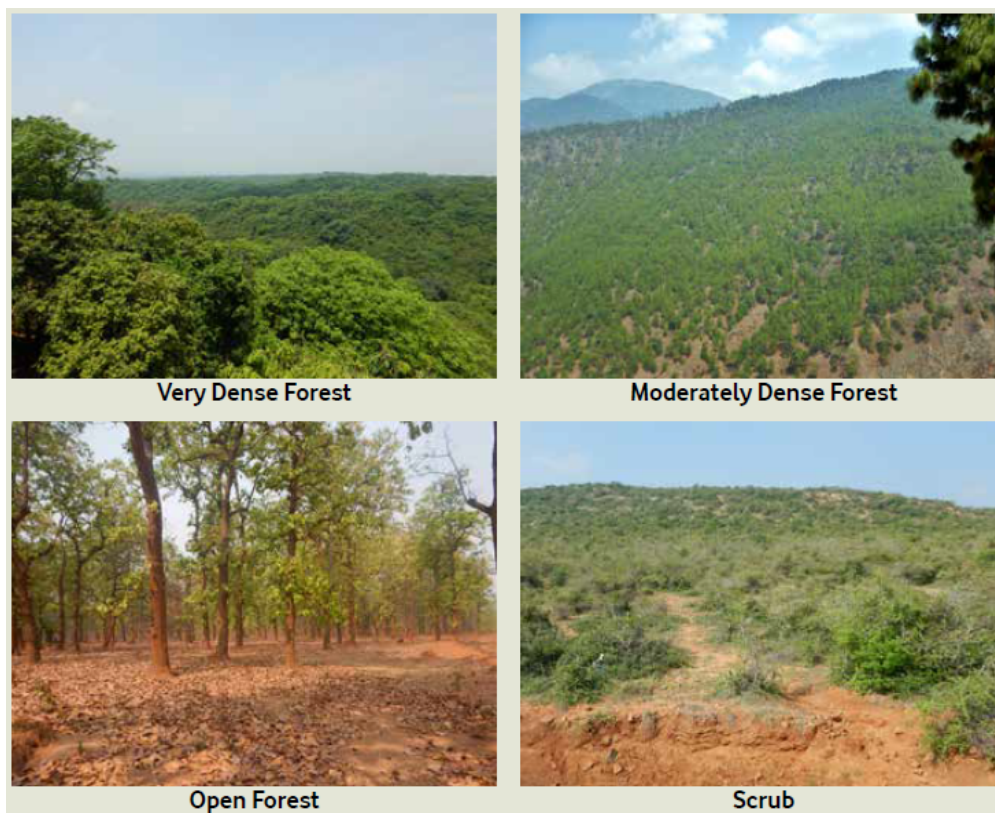
- **Report Information** - The report contains information on forest cover, tree cover, mangrove cover, growing stock, carbon stock in India's forests, instances of forest fire, Agroforestry, etc.
- For the first time, the trees between 5-10 cm have been included in the analysis for Tree Cover and Growing stock as they are a major contributor to paper and pulp industry.
- **Forest cover degradation** - Analysis on Forest cover degradation between 2011-2021 has been carried out for identifying 93,000 km² potential areas for upgradation of density and additionally sequestering 636 Mt of Carbon.
- **Forest fire** - Information on forest fires in 705 Protected areas is given for the first time.
 - Burnt area assessment as part of forest fire assessment has been done for the first time at national level
- **Significance of the report:**
 - Providing vital information for monitoring the country's forest and tree resources
 - Useful source of information for the policy makers, planners, State Forest Departments, and others interested in natural resource conservation and management.

- Digitized forest boundaries of 25 States and UTs have been used in the current ISFR to assess the extent of forest cover within the recorded forest areas.
- Monitoring of NDC targets
- Reporting of GreenHouse Gas (GHG) inventory to UNFCCC for the forest land under the LULUCF sector
- Reporting to FAO for the Global Assessment of Forest Resources.

What is the state of Tree and Forest cover of India in 2023?

- **Forest cover** - All lands, **more than one hectare** with a tree **canopy density** of more than or equal to **10% irrespective of ownership**, legal status and land use.
- Such lands may not necessarily be a recorded forest area and It also **includes orchards, bamboo and palm**.

Classification of forest cover	
Types	Canopy density
Very Dense Forest (VDF)	Equal to or more than 70%
Moderately Dense Forest (MDF)	40-70%
Open Forest (OF)	10-40%

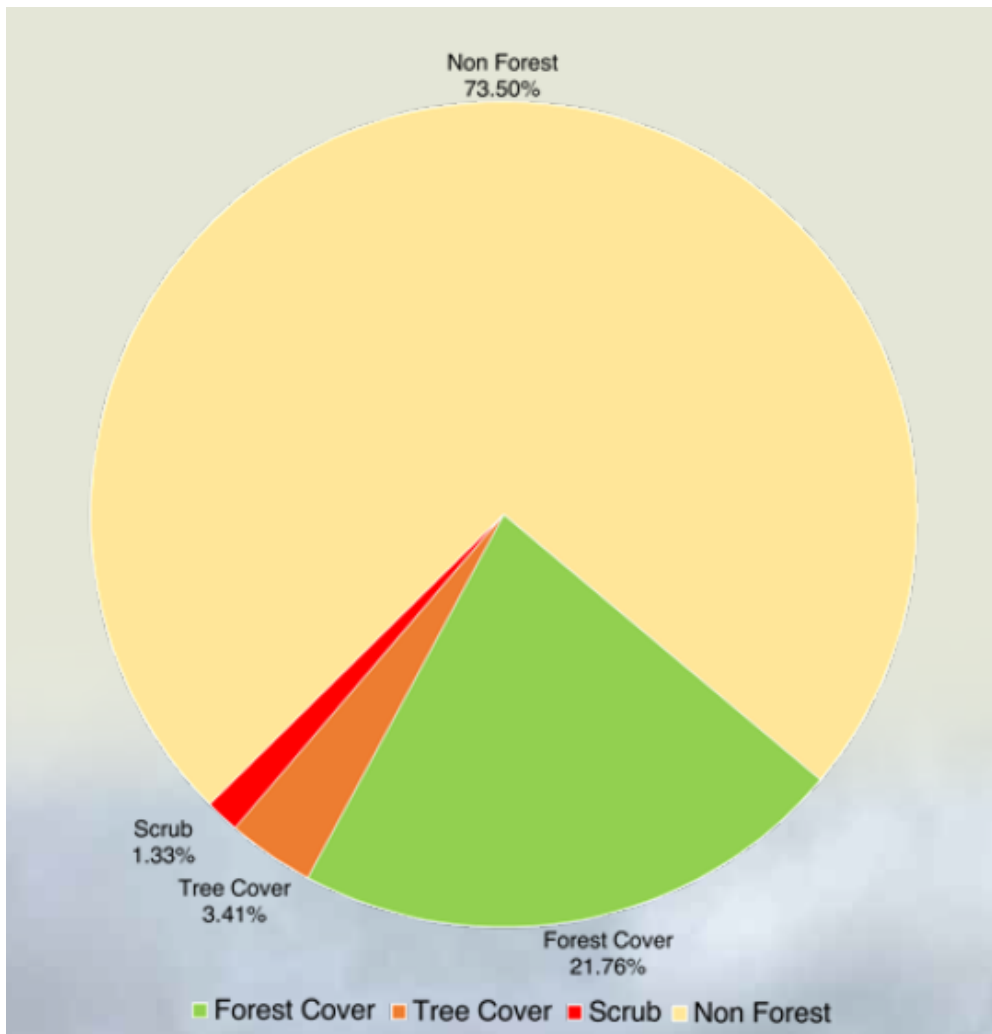


- **Total Tree and Forest Cover in 2023** - As per the present assessment, the total Forest and Tree cover is **8,27,357sq km**, which is **25.17 %** of the geographical area of the country.
 - **Forest Cover** - 7,15,343sq km **(21.76%)**
 - **Tree Cover** - 1,12,014 sq km **(3.41%)**.

Forest and Tree Cover of India

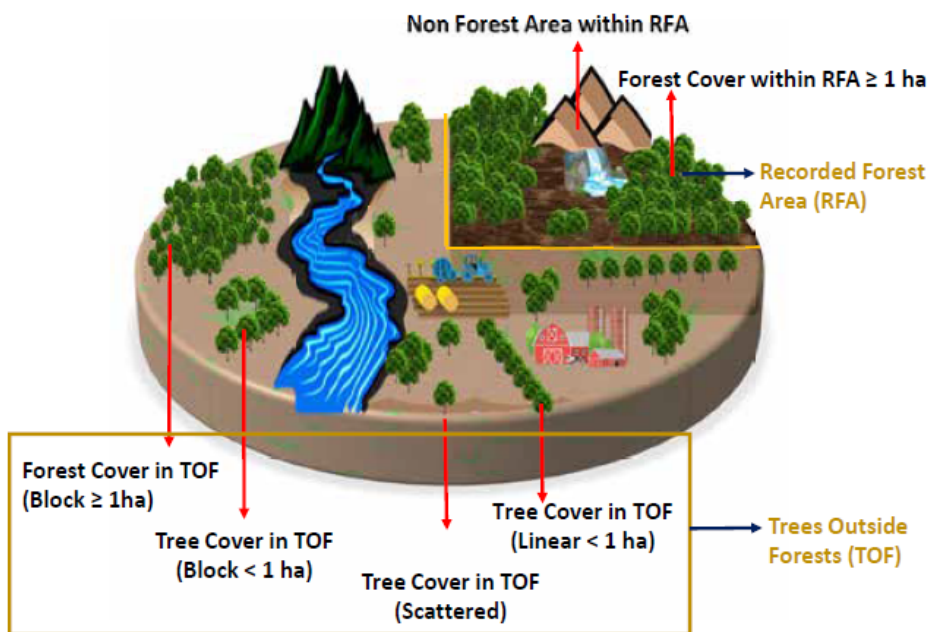
in km²

Class	Area	Percentage of GA
Forest Cover	7,15,342.61	21.76
Tree Cover	1,12,014.34	3.41
Total Forest and Tree Cover	8,27,356.95	25.17
Scrub	43,622.64	1.33
Non Forest	24,16,489.29	73.50
Geographical Area of the country	32,87,468.88	100.00



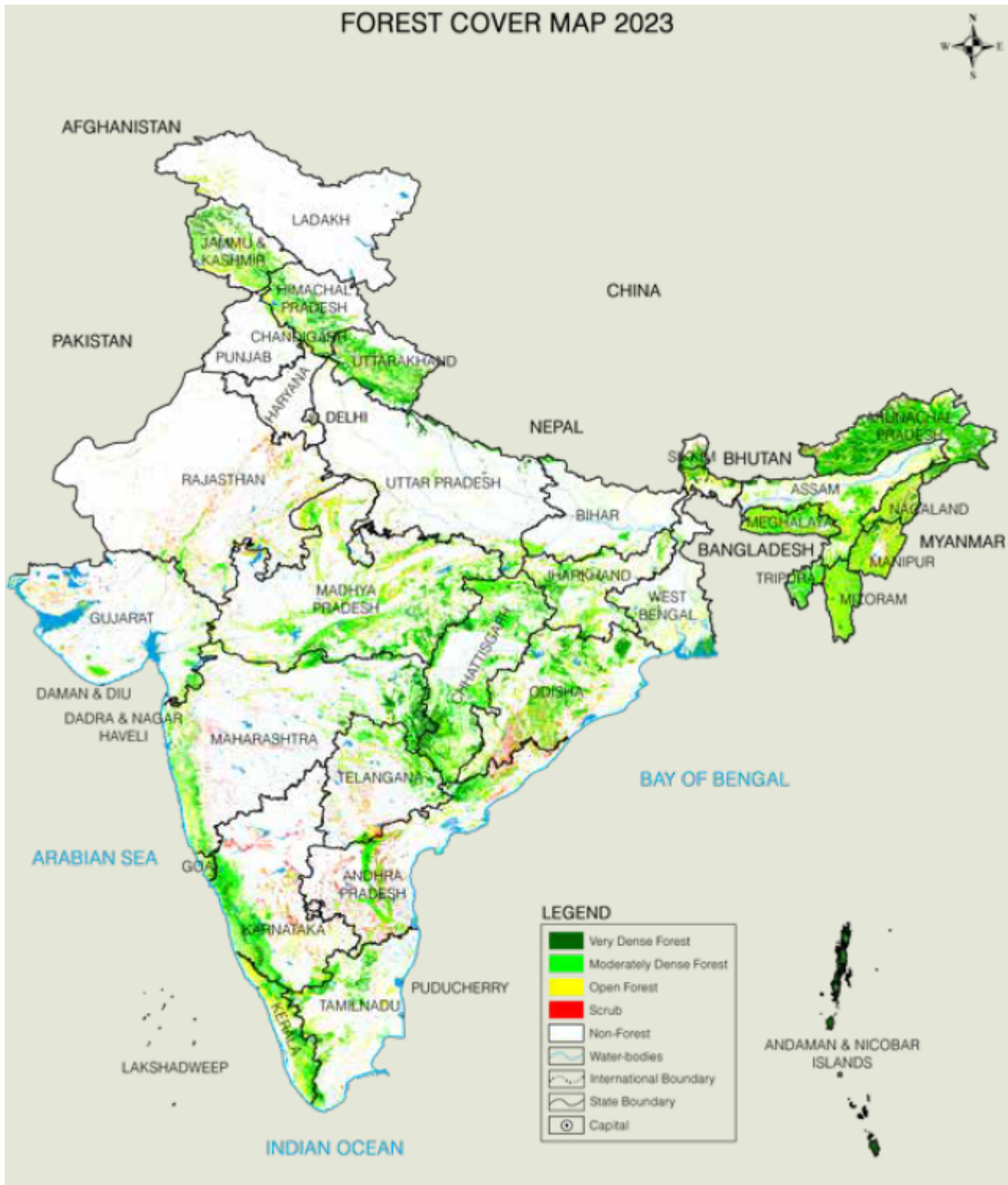
- **The extent of Trees Outside Forest** - 30.70 M ha(37.11% of the total forest and tree cover)

TOF is the extent of forest cover outside the Recorded Forest Area(RFA) & Green Wash(GW) and tree cover.



Largest forest and tree cover states(Area wise)	<ul style="list-style-type: none"> - Madhya Pradesh (85,724 sq km) - Arunachal Pradesh (67,083 sq km) - Maharashtra (65,383 sq km)
Largest forest cover states (Area wise)	<ul style="list-style-type: none"> - Madhya Pradesh (77,073 sq km) - Arunachal Pradesh (65,882 sq km) - Chhattisgarh (55,812 sq km)
Largest tree cover states (Area wise)	<ul style="list-style-type: none"> - Maharashtra (14,524.88 sq km) - Rajasthan (10,841.12 sq km) - Uttar Pradesh (8,950.92 sq km)
Largest forest cover states (percentage wise)	<ul style="list-style-type: none"> - Lakshadweep (91.33 %) - Mizoram (85.34 %) - Andaman & Nicobar Island (81.62 %)

21 States and UTs have shown an increasing trend in tree cover, which indicates that agroforestry, is being promoted in these States.

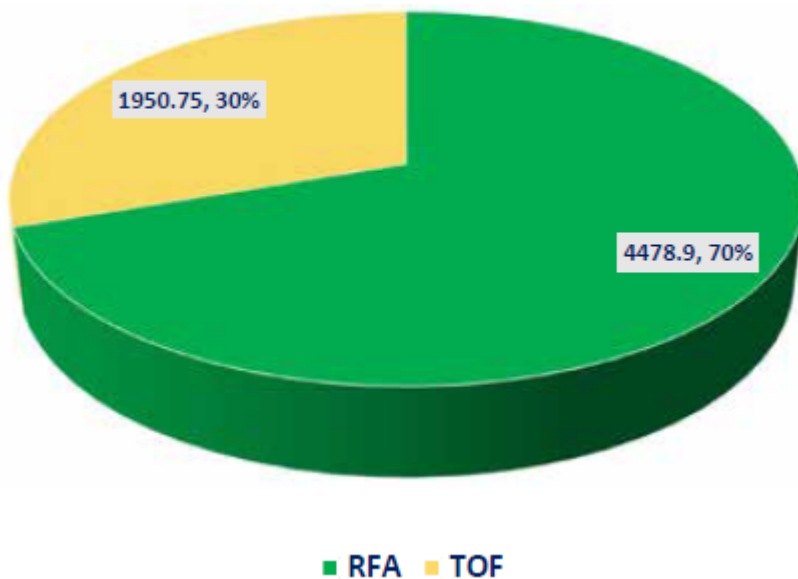


- **Number of States/UTs having above 33 % of forest cover - 19.**
- **States with more than 75% forest cover**
 - Lakshadweep, Mizoram, A & N Island, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, Manipur.
- **Total growing stock of forests - 6430 million cum(cubic meter).**
 - Inside the forests - 4479 million cum (cubic meter)
 - Outside the forest - 1951 million cum

Arunachal Pradesh has maximum growing stock (457.83 M m³) in forests, followed by Uttarakhand (400.02 M m³), Chhattisgarh (398.54 M m³) and Madhya

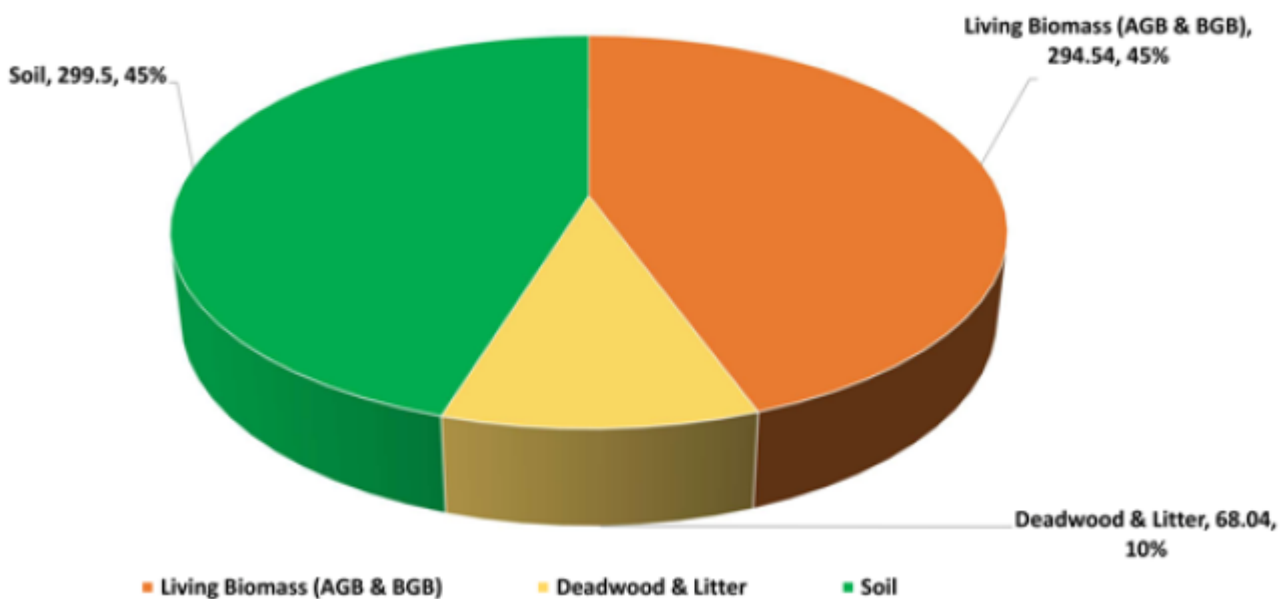
Pradesh (387.18 M m³).

Growing Stock of Forest & TOF (M m³)



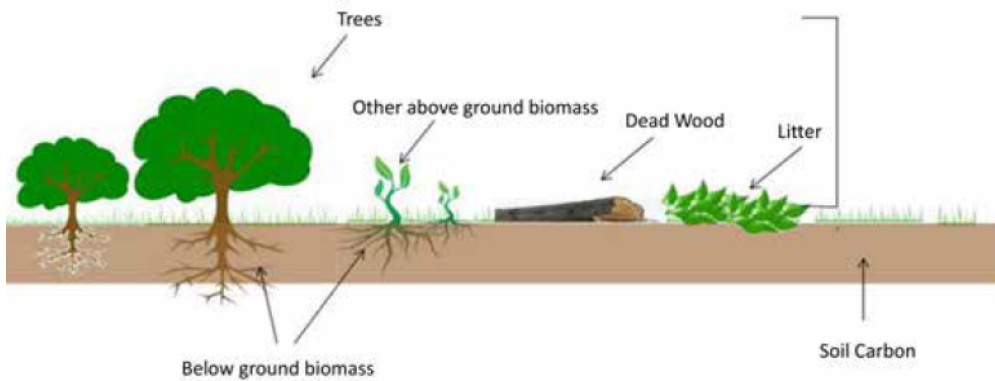
- **Total increase in forest stock** - 262 million cum
 - Increase in inside the forest - 91 million cum
 - Increase in outside the forest - 171 million cum
- **India's total carbon stock** - 30.43 billion tonnes of CO₂ equivalent
- **Total carbon stock in country's forest** - 7.2 Billion tonnes.
 - Increase in carbon stock - 81.5 million tonnes.

Global Forest Carbon Stock (Billion Tonnes) in Different Pools



CARBON POOLS (IPCC GPG)

Above ground biomass, Below ground biomass, Litter, Dead wood, and Soil Organic Carbon



- **States with largest carbon stock**

- Arunachal Pradesh has maximum carbon stock of 1,021 Mt
- Madhya Pradesh (608 Mt)
- Chhattisgarh (505 Mt)
- Maharashtra (465 Mt).

As compared to the base year of 2005, India has already reached 2.29 billion tonnes of additional carbon sink as against the target of 2.5 to 3.0 billion tonnes by 2030.

Soil organic carbon is the ***largest pool of forest carbon*** accounting for (55.06%) followed by Above Ground Biomass (AGB) (32.69%), Below Ground Biomass (BGB) (10.09%), Litter (1.48%) and Dead Wood (0.78%).

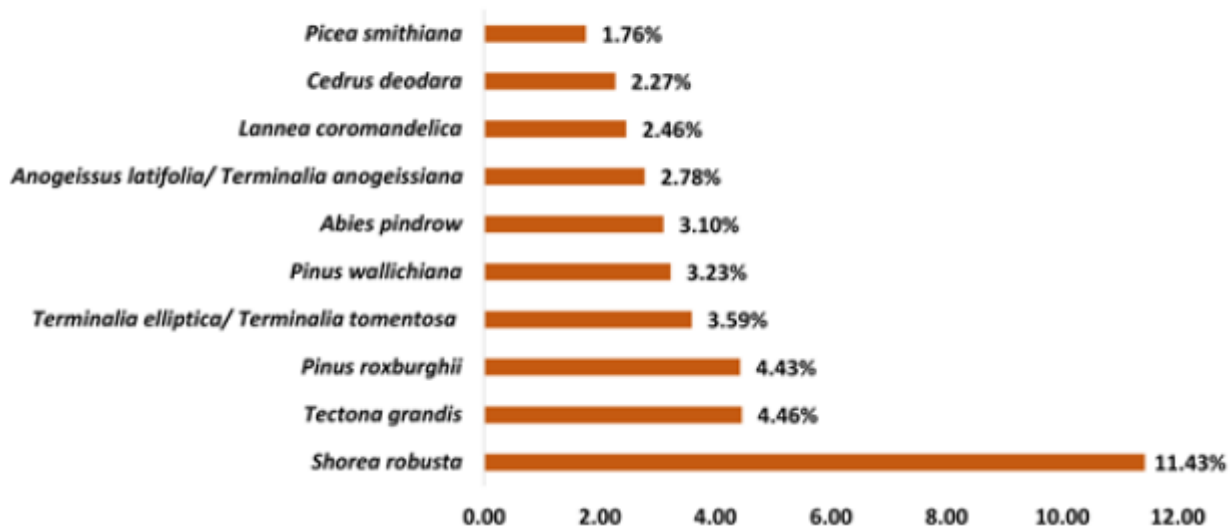
- **Major Trees inside the forest (Volume wise)**

- Shorea robusta (11.43%)
- Tectona grandis (4.46%)
- Pinus roxburghii (4.43%)
- Terminalia tomentosa (3.59%).

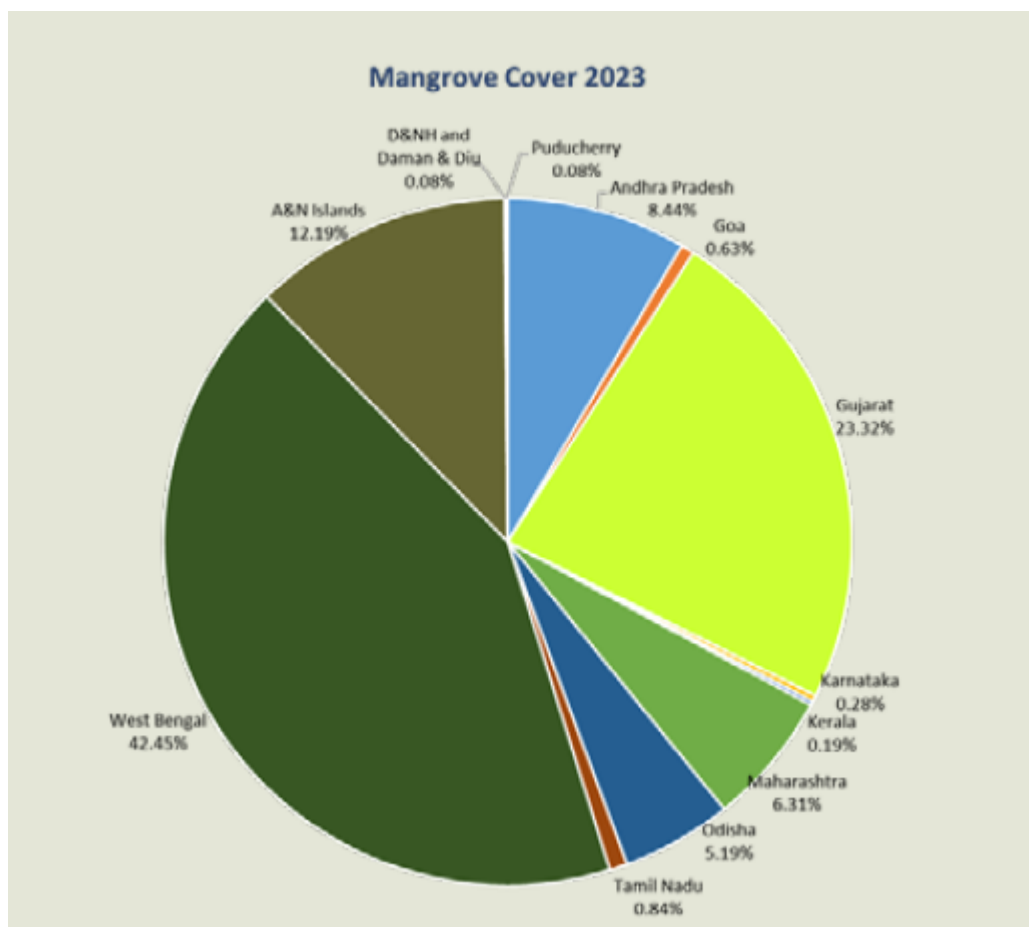
- **Major trees outside the forest**

- Mangifera indica (13.25%)
- Azadirachta indica (7.00%)
- Madhuca latifolia / Madhuca longifolia / Madhuca indica (4.37 %)
- Cocos nucifera (4.16 %).

Growing Stock wise top ten species in RFA



- **Total mangrove cover - 4,992 sq km (0.15%).**
 - Net **decrease** (from 2021) in mangrove cover - 7.43 km²
 - Gujarat has a notable decrease of 36.39 km²
 - Notable increase in Andhra Pradesh (13.01 km²) and Maharashtra (12.39 km²).



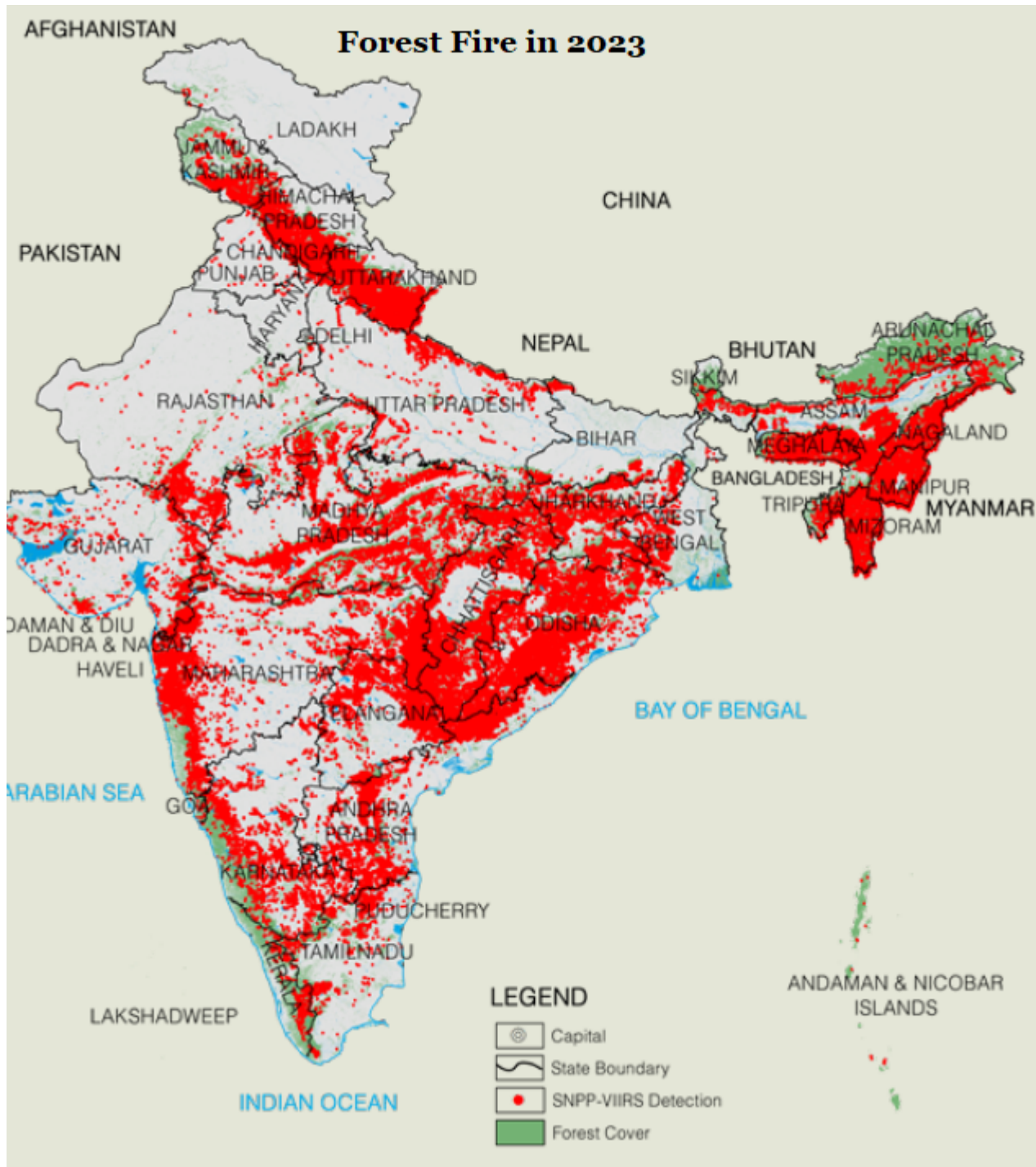
- **Total bamboo bearing area - 1,54,670sq km.**
 - Increase in bamboo cover - 5,227 sq km
- **States with largest bamboo cover**

- Madhya Pradesh - 20,421 km²
- Arunachal Pradesh - 18,424 km²
- Odisha - 12,328 km²

Bamboo cover has been estimated for the first time and included in Tree cover.

- The total annual potential production of timber from trees outside forest - 91.51 million cum.
- **Agroforestry** - It accounts for 1,27,590 km² of tree cover and 1,292 Million m³ of Growing stock.
- **Area of Western Ghats Eco-Sensitive Areas (WGESA)** - 60,285.61 km².
 - Forest cover in all districts under WGESA - 44,043.99 km² (73%).
 - Loss of forest cover in WGESA - 58.22 km²(During the last 10 years)
 - Very Dense forest increased by 3,465.12 km²
 - Moderately Dense Forest and Open Forest decreased by 1,043.23 km² and 2,480.11 km².
- **The total forest and tree cover in the North Eastern** - 1,74,394.70 km² which is 67% of geographical area of these states.
 - Decrease of forest cover in the region - 327.30 km².
- **Forest fire** - Top three States with fire incidences 2023-24 season - Uttrarakhand, Odisha and Chhattisgarh.

In 2019, National Disaster Management Plan (NDMP) by National Disaster Management Authority (NDMA) recognised forest fires as one of the national disasters.



How much has the forest and tree ecosystem changed?

- **Increase total forest and tree cover** - There is an increase of **1445 sq km** from 2021.
 - Increase in forest cover - 156 sq km .
 - Increase in tree cover - 1289 sq km.
- **Maximum increase in forest and tree cover**
 - Chhattisgarh (684 sq km)
 - Uttar Pradesh (559 sq km)
 - Odisha (559 sq km)
 - Rajasthan (394 sq km).
- **The maximum decrease in forest and tree cover**

- Madhya Pradesh (612.41 km²)
- Karnataka (459.36 km²)
- Ladakh (159.26 km²)
- Nagaland (125.22 km²).
- **Changes in last decade(2013-2023)**
 - Increase in forest cover - 16,630.25 km²
 - Increase in tree cover - 20,747.34 km².
 - Increase in mangrove cover - 296.33 km²
 - Increase in agroforestry tree green cover - 21,286.57 km²
- **Improvement in soil health**
 - Changes in shallow to deep soil - 87.16% (as against 83.53% in 2013)
 - Improvement in medium to deep humus - 18.04% (as against 11.43% in 2013)
 - Improvement in grass cover - 17.21% (15.64% in 2013)
 - Increase in soil organic carbon - 56.08 tonnes per hectare (55.85 in 2013)

References

1. [PIB | India State of Forest Report 2023](#)
2. [FSI | ISFR 2023 Report](#)

