

# TEZPUR UNIVERSITY



## Mass Communication & Journalism Department

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1).

**Title : Mapping & Assessment of Forests of the Nation.**

**Place : Guwahati, Assam.**

**Date : 02.06.2021**

***By Ankita Bhowmick***

Forest Survey of India (FSI) which is a national organization under the ministry of Environment, Forest & Climate change and in every 2 years, it volunteers the assessment of country's forest resources at the national level that are presented as the 'Indian State of Forest Report (ISFR)'. The first report was presented on 1987 and the ISFR 2019 is the 16th in the series. The informations presented through regular nation wide mapping of forest cover, sample plots based national forest inventory and the specific studies provides primary information on various parameters of the forest resources of the country. ISFR helps in providing important information and data to the forestry sector of the nation and in great lengths are used for policy formulations, planning and management of forests both at the national level as well as at the State and Union Territories and also at times are used for various international communication with organization such as FAO, UNFCCC, CBD, etc.

The forest cover mapping was largely done by visual interpretation method till 1999 but since 2001, the digital interpretation method was adopted to get a better and more efficient assessment of the forest. Presently, enhancement in methodology of satellite data interpretation have been taken up and a Manual of Forest Cover has been published. The latest satellite data are obtained from the National Remote Sensing Centre (NRSC) under the Indian Space Research Organization (ISRO).

The two terms 'Forest Cover' & 'Recorded Forest Area (RFA)' are commonly used to describe the extent of forest and may appear similar but have different meanings. Under the term Forest Cover comes the country's all patches of land with a tree canopy density of more than 10% and more than 1 ha in area, irrespective of their legal status, land use, ownership and species composition. The assessment is made by wall to wall mapping exercise using remote sense technique followed by intensive ground truthing. On the other hand, Recorded Forest Area is described as any such lands which have been identified as forest under any

Government Acts or Rules or recorded as 'Forest' in the Government records. The data of Recorded Forest Area are collected from the State Forest Departments by the FSI. In the figure 1.1, the diagram shows the relativity of the two terms though overlapping each other but are not attached to one another.

While maintaining balance with the advancement of technology and refinement in methodologies, Currently, ortho-rectified LISS III data of IRS Resourcesat-2 with a spatial resolution of 23.5 meters for the time period of October to December 2017 have been used for the analysis at a scale of interpretation 1:50,000 with the minimum mappable unit of 1 ha. For the Present assessment, ground truthing has been implemented at more than 2,200 locations across the country.

In addition to this, National Forest Inventory (NFI) which is another major forest resource assessment activity is executed by the FSI with the chief objective to determine the growing stock of trees, number of trees, bamboo, soil carbon, occurrence of NTFP and invasive species and several other parameters at the State and National Level representing growth and health of forest. Since the year 2016, a new grid based forestry inventory design was adopted by FSI in which approximately 6,000 sample plots are laid in forest area and about 10,000 plots are laid in trees outside forests including urban areas every year. Thus in short, it ensured higher sampling intensity with uniformly spread sample plots across the country leading to higher precision. Further major information assessed from the data of TOF is the estimate of tree cover which includes all patches of tree occurring outside of RFA that are of Less than 1 ha including the scattered trees.

Some of the noted and special features in ISFR 2019 have been the nation-wide study that has been undertaken to evaluate the dependence of people living in Forest Fringe villages for fuelwood, fodder, bamboo and small timber on the forests. The outcome of the study will help in both weighing the impacts of programmes and policies and at the same time will also serve in understanding the gap between the potential productivity and actual increment observed in the forests of the country.

A new chapter 'Forest Types and Biodiversity' has also been added which puts forward findings of forest type mapping based on Champion & Seth Classification (1968) and the result of the first ever biodiversity assessment of plant species in the 16 Forest Type Groups. Forest and hydrology are intensively related for which the wetlands play a pivotal role in forest-water

regime and forest hydrology. Thus comprehensive data about the extent and types of wetland within Recorded Forest Area (RFA) are presented. Results of the special study on the fire proneness of States based on forest fire alerts generated to the users who have registered themselves on the FSI's website through sms, email and web map service by FSI in the last 13 years are also being presented. This particular would allow the SDFs to manage better and control forest fires in the respective States. In addition to the forest cover in different altitude zones, an additional exercise has been undertaken to assess forest covers on different slopes classes for each State and UT of the country. Thus this information will be useful in developing strategies for catchment area treatment programmes. Along with this, under NFI information on important invasive species are collected on each sample plot and also, a new information has been generated from the forest inventory data about the top five NTFP species availability in forests. And lastly, to provide an input for sustainable development of the forest dia-class distribution of five predominant species has been determined.

For the purpose of improving the system and processes used in the activities, FSI always strives hard and new studies are also undertaken. Several initiative has been taken recently which includes- FRL prepared by FSI, that is the base line emission level from the forests and is also one of the four requirements for a country to be REDD+ ready and is used for determining performance of the country towards REDD+ implement and performance based financing. The monitoring and management is a great aspect for which the FRA (Forest Resources Assessment) process is coordinated by the Forest Department of FAO. A new improved grid based design has been adopted which in turn led to numerous improvements like sampling intensity has increased leading to higher precision, sample plots are uniformly spread, etc. Another new activity of establishing a network of Permanent Observation Plot (POP) was spread across the country with the aim of long term ecological monitoring of forests. With this, FSI has introduced drones in its activities on pilot basis and methodology for application of drones in forest boundary demarcation is being standardized.

Finally, FSI under joint collaboration with ISRO institutions has undertaken national level project for estimation of Above Ground Biomass (AGB) for the country and has also completed biomass mapping for the state of Assam and Odisha using Phased Array Type L-band Synthetic Aperture Radar (PALSAR) mosaic with forest inventory data at sample plots of FSI.

2).

**Topic : Forestry Scenario of Assam Vs The entire country.**

**Place : Guwahati, Assam**

**Date : 04.06.2021**

Forest the most important part of our survival too needs assessment in order for its preservation and right usage. The Forest Cover widely signifies the expanse of Forest Resources in a country or a region and it's periodic assessment was started by the Forest Survey of India in 1987 using remote sensing techniques. All trees standing with canopy density over 10% and having an extent of more than one hectare, including tree orchards, bamboo, palms, etc within recorded forests, on other government lands, private, community or institutional lands are included in the forest cover assessment. The assessment published in India State of Forest Reports (ISFR) is an important source of information and is used by different governmental bodies, organization and other stakeholders. National Forest Policy of India, 1988 envisages a goal of achieving 33% of geographical Area of the country under forest and tree cover. Nation-wide forest cover mapping done by FSI serves as a monitoring mechanism towards this policy goal.

The wall to wall mapping of forest cover of the country since 1999 is based on data from the indigenous LISS III sensor. For the cycle of 2019, Data from the latest LISS III sensor onboard Resourcesat-2 satellite has been used. LISS III data with the resolution of 23.5m allows mapping at the maximum scale of 1:50,000 at which the minimum mappable unit becomes 1 ha. The forest cover mapping is done following a set of sequential steps which involve a hybrid approach for classification of satellite data using digital image processing, visual image analysis, post classification comparison, ground truthing and validation by the state forest department.

The 2019 Forest Cover Assessment shows that the forest cover of the country has been mapped into three canopy density classes viz Very Dense Forest (VDF), Moderately Dense Forest (MDF) and Open Forest (OF). The total forest cover of the country, as per current assessment is 7,12,249 sq km which is 21.67% of the total geographical area of the country. In terms of the canopy density classes, area covered by VDF is 99,278 sq km (3.02%), MDF

is 3,08,472 sq km (9.26%).

The table 2.4 given in the forest cover document shows Madhya Pradesh as the largest forest cover in the country followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra. In terms of the forest cover as percentage of total geographical area, the top five states are Mizoram (85.41%), Arunachal Pradesh (79.63%), Meghalaya (76.33%), Manipur (75.46%) and Nagaland (75.31%), which are all from the Northeastern region of the country.

Recorded Forest Areas largely consists of Reserved Forests (RF) & Protected Forests (PF), which have been constituted under the provisions of Indian Forest Act 1927 or its counterpart State Acts. Areas which have been recorded as forests in the revenue records or have been constituted under any other State Act or Local law are also included in the RFA. In the Survey of India (SOI) topographic sheets, area shown by green color is generally referred to as green wash and represents forested areas at the time of survey for preparing such topographic sheets. The green wash has been used as a substitute to RFA in respect of those States & UTs from where the usable digitized boundaries of recorded forest areas could not be made available to FSI.

Accuracy Assessment of Forest Cover which is carried out to assess accuracy of interpreting a ground feature using satellite image is an essential part of remote sensing based mapping. It is done by comparing the interpreted satellite image i.e.; Classification with the reference data which is collected from the ground. Accuracy Assessment is presented in the form of an error or confusion matrix prepared by comparing agreement and disagreement between the remote sensing based classification with the reference data on a class-by-class basis at randomly selected locations.

In contrast to this, let us also know about Assam's Forestry scenario. Assam the second largest state in Northeast India is situated south of the eastern Himalayas along the mighty Brahmaputra and Barak River valleys, which along with their tributaries nourish a wide range of precious Flora and fauna in the state. The State has a geographical area of 78,438 sq km, which is 2.39% of the geographical area of the country. It is bordered by Arunachal Pradesh in the north, Meghalaya, Tripura and Mizoram in the south, Nagaland and Manipur in the East and West Bengal in the West. Assam is the land of enchanting aesthetic beauty with lush green hills, pastures, tea gardens, river plains, and wilderness. The Kaziranga National Park, a UNESCO World Heritage Site in the State is home to two-thirds of the world's population of

one-horned rhinos. Assam can definitely boast of possessing a host of endangered and rare mammals, avian and amphibian species. These include pigmy hog, hispid hare, white winged wood duck and great indian hornbill among many others.

As per the Champion and Seth classification of Forest Types (1968), the forest of Assam belongs to seven Forest Type Groups further divided into 25 different Forest types. Recorded Forest Area of the State is 26,832 sq km of which 17,864 sq km is Reserved forest and 8,968 sq km is Unclassed Forest. Five National Parks and 18 Wildlife Sanctuaries constitute the Protected Area network of the State competition covering 4.87% of it's geographical area.

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Nov 2017 to Feb 2018, the Forest Cover in the State 28,326.51 sq km which is 36.11% of the State's geographical area. In terms of the Forest Canopy density classes, Assam has 2,794.86 sq km under VDF, 10,278.91 sq km under MDF and 15,252.74 sq km under OF. Forest Cover of the state has increased to 221.51 sq km overtime and this increase is mainly due to plantation mostly outside of forest areas.

In Assam the extent of Recorded Forest Area (RFA) has been reported to be of 26,832 sq km which is 34.21% of it's geographical area. The reserved and unclassified forest are 66.58% and 33.48% of the recorded forest area in the State respectively. Due to the non-availability of digitized boundary for Recorded forest areas from the State, the updated Green Wash from Sol toposheets which is 27,547.84 sq km has been used as proxy to the RFA boundary.

Percentage area under different forest types of Assam as per the Champion and Seth classification (1968) is the highest in Cachar Semi-Evergreen Forest (37.75%), East Himalayan Moist Mixed Deciduous Forest (17.92%) and Assam Valley Tropical West Evergreen Forest (3.56%) followed by the other Forest types of The state.

Trees occurring in patches of size less than 1 ha including scattered trees are assessed through sampling based methodologies. Tree cover in Assam has been estimates as 1,408 sq km. The tree cover of Assam has decreased by 88 sq km as compared to the previous assessment report.

Trees Outside Forest (TOF) refers to tree resources found outside the forest as defined in the government records. Forest cover outside the recorded forest area is derieved using

boundaries of RFA or Green Wash. A nation wide study has been conducted to understand the dependence of people living in the villages near forest for fuelwood, fodder, small timber and bamboo in quantified terms for each state and UT of the country. Thus, with this we now understand where the forestry scenario of the state of Assam stands in comparison to the entire country.

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