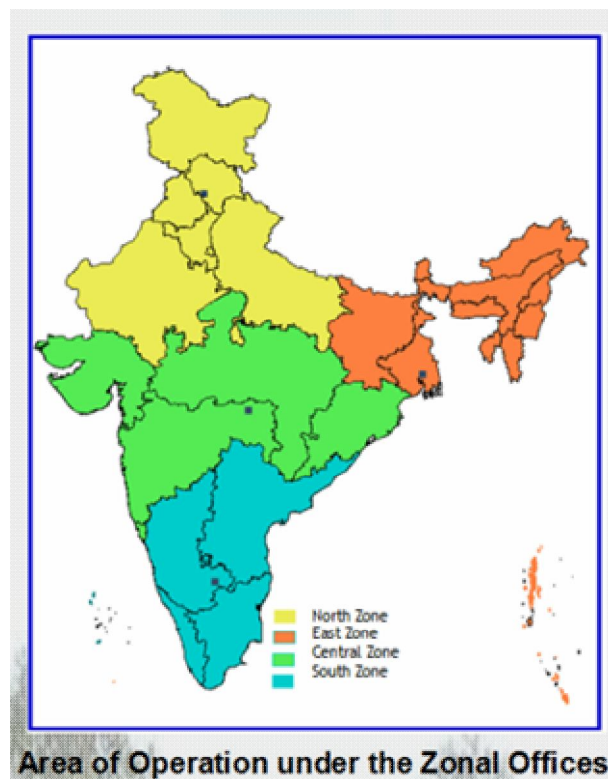


# REGIONAL OFFICES OF FSI



Forest Survey of India (HQ) and Zonal Offices



Area of Operation under the Zonal Offices

## Headquarters, Dehradun

Headquarters of Forest Survey of India is located at Dehradun.



Two functional units at Headquarters, Dehradun are:

- 1) NFDMC
  - 2) Training & Forest Inventory, each headed by a Joint Director.
- They are supported by Deputy Directors, Assistant Directors and secretarial and technical staff in carrying out the functions of planning, designing, quality control and administration.
  - Apart from regular mandated activities short term projects and special studies are carried out.



## Regional Offices of FSI

Each Regional office is headed by a Regional Director supported by Deputy Directors and secretarial and field staff. Its main function is field data collection for forest inventory, though their functions have expanded to include forest cover mapping of selected areas.



## Central zone, Nagpur

The Central Zone office of PISFER was set up at Jagdalpur in 1966 shifted to Nagpur in 1976. Area under its jurisdiction include the states of Madhya Pradesh (MP), Maharashtra, Chhattisgarh, Gujarat, Goa, Dadra & Nagar Havel (UT), and Daman & Diu (UT).

Apart from conducting inventory of forests and Trees outside Forests (TOF), it also carries out: -

- Forest Cover Assessment of Maharashtra, MP, Chhattisgarh, Gujarat and Goa.
- Extensive training programs for State Forest Departments (SFDs) in Application of Remote Sensing, GIS & GPS in forestry, Inventory techniques, e-Green Watch and Decision Support System (DSS).



## Southern Zone, Bangaluru

The Southern Zone office was established during 1982. Its mandate is to conduct inventory of Forests and TOF in the states of Karnataka, Andhra Pradesh, Kerala, Tamil Nadu (TN) and Telangana. It also carried out special studies on Mangroves & TOF inventory in TN.



## Eastern Zone, Kolkata

The Eastern Zone office of PISFER was created in the year 1974. After the reorganization of PISFR (1981), the office has been functioning as the Eastern Zonal office of FSI. Its mandatory works are: -

- Engaged in inventory of forests and TOF in its area of jurisdiction Bihar (including present Jharkhand), West Bengal, Odisha, Sikkim, Meghalaya, Tripura, Manipur, Nagaland, Mizoram, Assam, Arunachal Pradesh and the Union Territory of Andaman and Nicobar Islands.
- Also collaborated with the Nagaland Forest Department in an inventory project in the State.



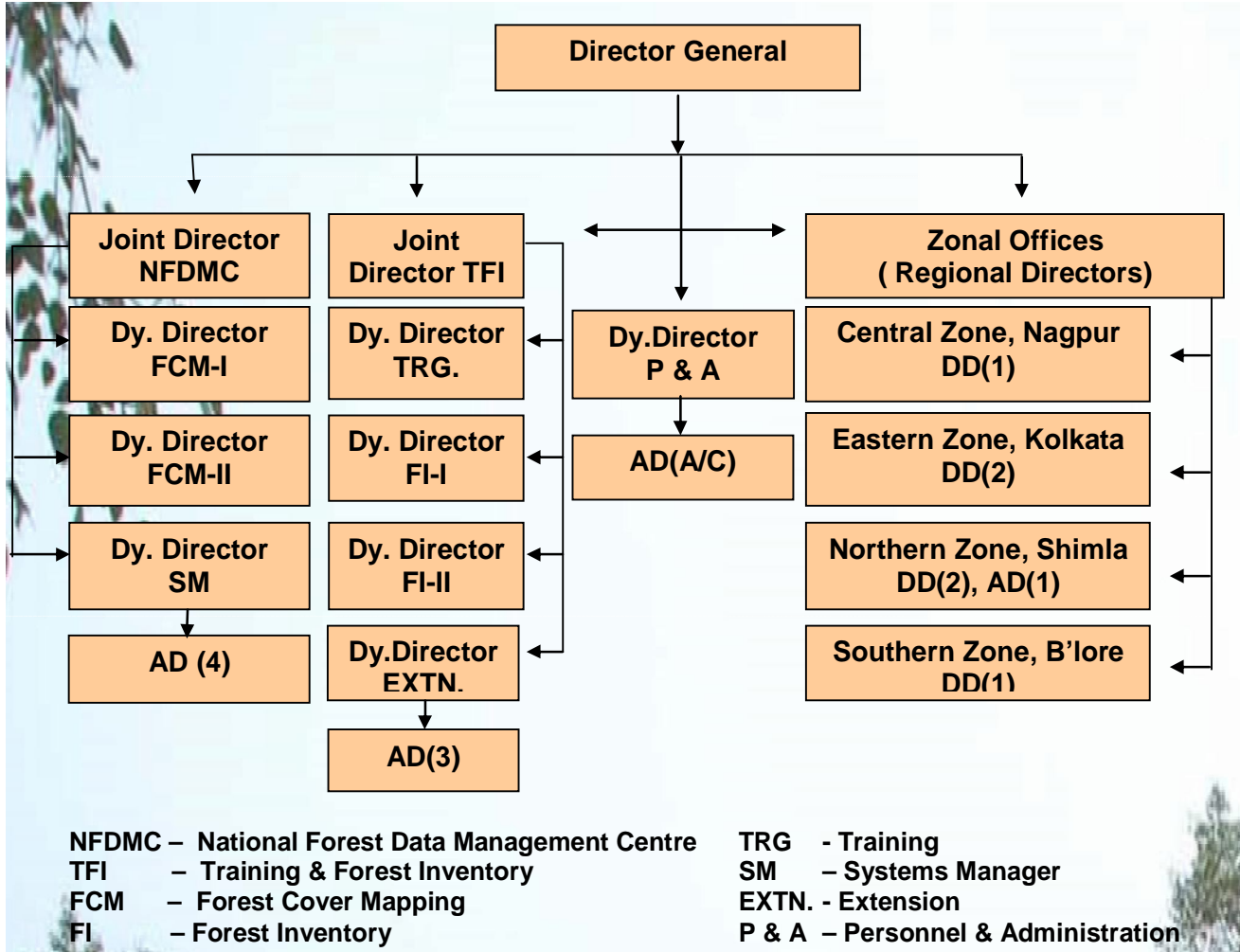
## Northern Zone, Shimla

The Northern Zone office of FSI is in Shimla with jurisdiction over the States of Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, Haryana, Punjab, Chandigarh, Rajasthan, Delhi and Uttaranchal. Its mandatory works are: -

- Carries out forest cover assessment beyond its domain, including a study on household wood consumption in rural Meghalaya (1986-88), preparation of a survey scheme and a field work of survey operation in 1979 in Western Nepal.
- FSI was involved with His Majesty's Government survey of Forest Resources in Western Nepal in setting up a paper mill of which field work of survey operation was carried out from October 1979 to February 1980.
- Carried out TOF resource assessment in Haryana (2012-14)



# ORGANISATIONAL STRUCTURE



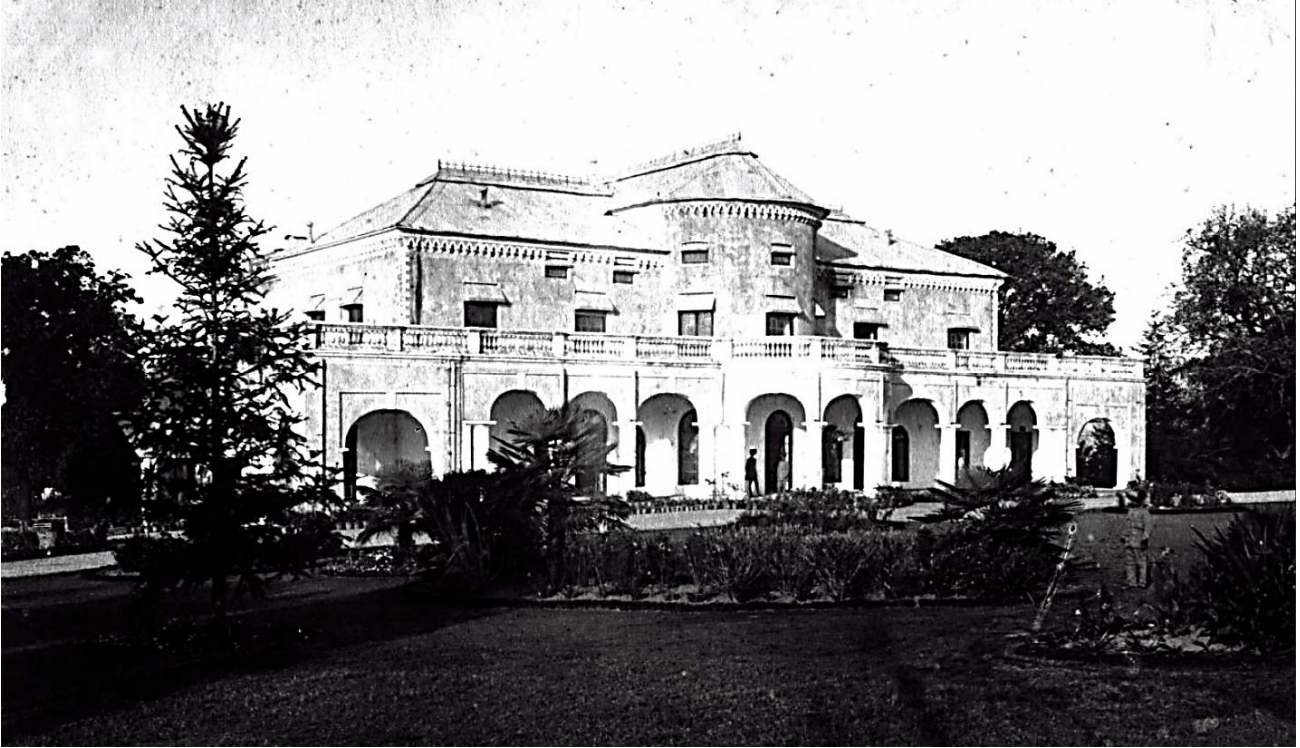
## Structure of the organization

- FSI is headed by Director General.
- The DG, FSI overall looks after the various activities undertaken by the organization.
- The organization has its Head Quarter at Dehradun where most of the professional staff responsible for planning, designing, quality control and administration is based.
- Four zonal offices located at Shimla, Kolkata, Nagpur and Bengaluru each headed by a Regional Director supported by Deputy Director, Assistant Director, Technical Staff and Field Staff.
- Its main function is the collection of field data for forest Inventory, though their functions have expanded to include forest cover mapping.



## ROOTS OF FOREST SURVEY OF INDIA (FSI)

The “Pre-investment Survey of Forest Resources” (PISFR)” a project for large scale forest inventory was initiated in the year 1965, jointly sponsored by FAO, UNDP and Government of India (GoI). PISFR was succeeded in 1981 by the FSI, an organization under the Ministry of Environment, Forests and Climate Change (MoEF&CC), GoI. Its mandate was to carry out a regular assessment of country’s forest cover and forest resources besides providing services of training, research and extension.



India’s rugged mountains, torrential rivers, sprawling towns and large expanses of plains, deserts, ravines and coast lines presented a formidable task in assessing the diverse forest ecosystems and the logistic challenge of reaching every inch on the ground with manpower and tools.



FSI was established in June 1981 as a full-fledged government organization to meet the data need of forestry sector for planning such as: -

- Adoption of uniform sampling design for forest inventory in the entire country.
- A separate unit viz. **National Forest Data Management Centre (NFDMC)** was established for vegetation mapping and storage/analysis of forestry related data.

## **ROLE OF FSI TODAY**

The India State of Forest Report is the flagship publication of FSI. The report is published biennially and is an authentic document on assessment of the country's forest resources.

FSI has completed fourteen cycles of the publication of the report in 2015.

# INITIATIVES

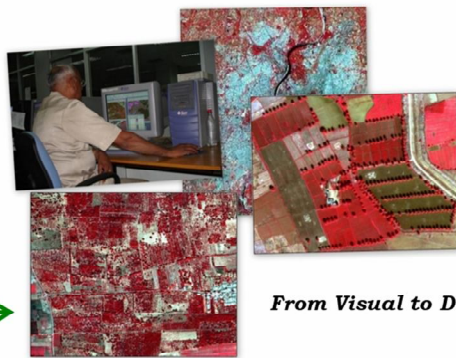
## Advancement in Satellite data Interpretation



*Aerial Photograph and its Interpretation*



*Cartography and Visual Interpretation*

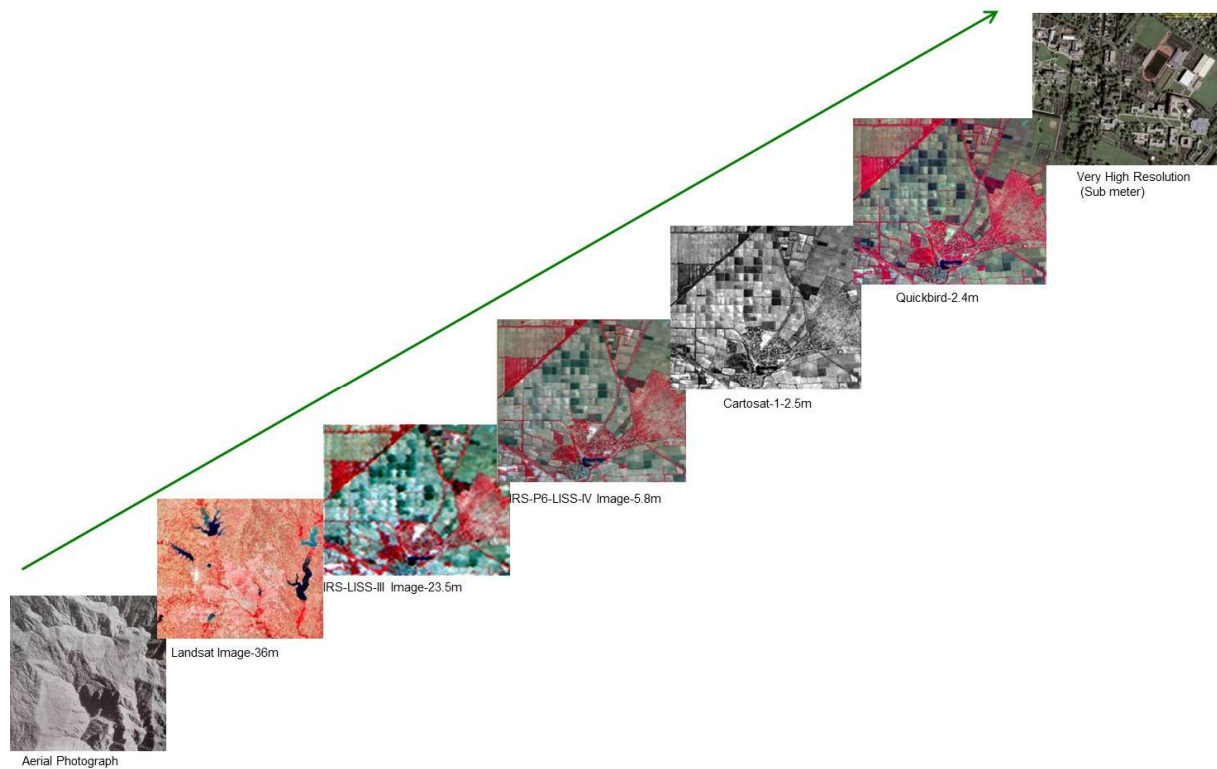


*From Visual to Digital Interpretation*

- Forest Cover Mapping started in 1987 using LANDSAT-MSS satellite data with a spatial resolution of 80m, the scale of mapping at 1:1000,000 and visual mode of interpretation.
- In 1989, LANDSAT-MSS satellite data was replaced by LANDSAT-TM with a spatial resolution of 30 meter and scale of mapping 1:250,000 which resulted in reducing the Minimum Mappable Unit (MMU) from 400 hectare to 25 hectare.
- Since 2001 the forest cover mapping has been carried out at a scale of 1:50,000 with the mode of interpretation changing from visual to digital.
- The MMU has been reduced from 25 ha to one hectare.



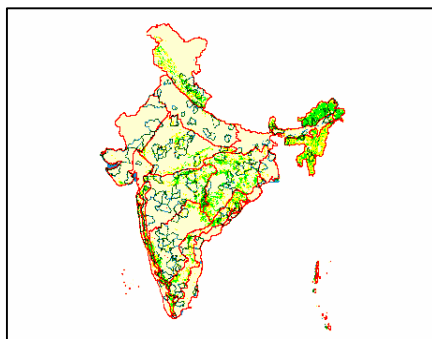
# Evolution of satellite Images in FSI over the Years for different Projects



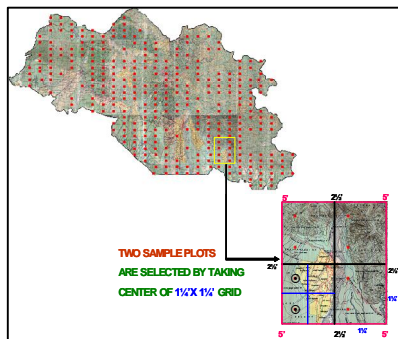
## National Forest Inventory

- FSI Designed and launched National Forest Inventory (NFI) in 2002 to generate National Level Estimates of different parameters of forest like Biomass, Carbon and Production & Consumption studies etc.
- Two stage sampling was followed, at first stratified the country with districts and second grid based design with single square plot of 0.1ha was adopted.

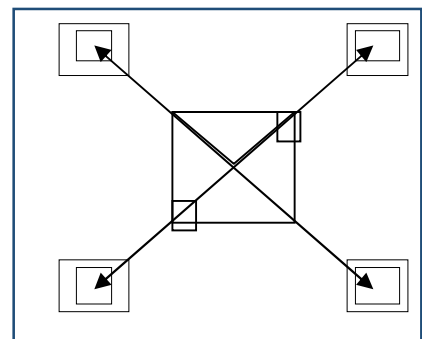
**60 districts selected randomly for inventory in a cycle of 2 yrs**



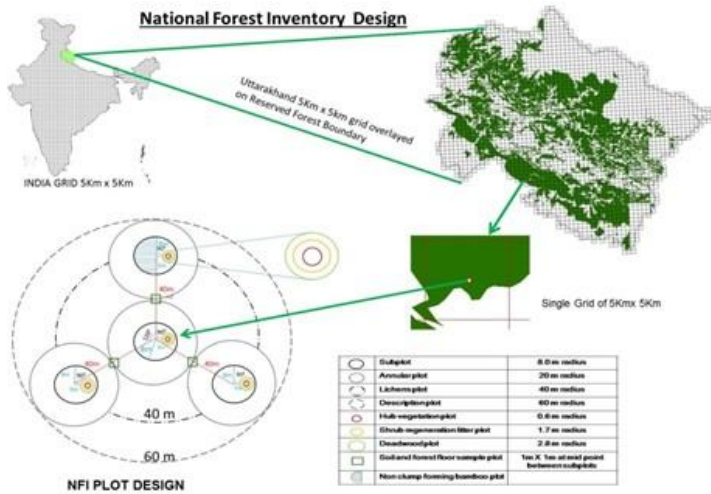
**Two sub-grids of 1¼' × 1¼' are selected randomly.**



**A square sample plot of size 0.1 ha in selected forest sub-grid.**



- The assessment of Trees Outside Forests (TOF) was brought within the ambit of NFI on 1<sup>st</sup> February, 2016.
- Grid (5kmx5km) based design at National level with cycle of 5 years (instead of 20 years) for forest and 10 years for TOF was considered with cluster plot design.
- Capable of providing national estimates with less than 5% error and States estimates with less than 10% error.



**Sampling of grids on 5 yr cycle**

1<sup>st</sup> yr – all 1s    2<sup>nd</sup> yr- all 3s    3<sup>rd</sup> yr – all 5s  
 4<sup>th</sup> yr – all 2s    5<sup>th</sup> yr- all 4s    6<sup>th</sup> yr- all 1s

5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1
2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2
3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3
4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4
5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1
2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2
3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3





## Training Programmes

Remote Sensing and GIS applications in forestry and survey techniques is a highly technical job and the skills required by officials working at different levels in SFD's are different. Consequently, following different types of courses are being conducted by FSI:



**Compulsory Course for IFS Officers for officers nominated by the MoEF&CC**

1. **Courses for officers and staff of State Forest Departments on the subject as carbon inventory, application of GIS and use of GPS/DGPS.**

2. **Customised and Outreach training courses.**

- Conducts outreach training courses on **'GPS Application in Forest Survey and Demarcation'**.
- FSI started training courses on **Decision Support System** and E-green watch, the two web based application developed by FSI, for SFDs and special training course for working plan officers.

3. **International training programme**

- On inventory of forest/TOF.
- Two courses for field level officers on 'Spatial Referencing of Monitoring of Illegal Killing of Elephants (MIKE)





## Connecting with the community

The extension unit at FSI is engaged in:

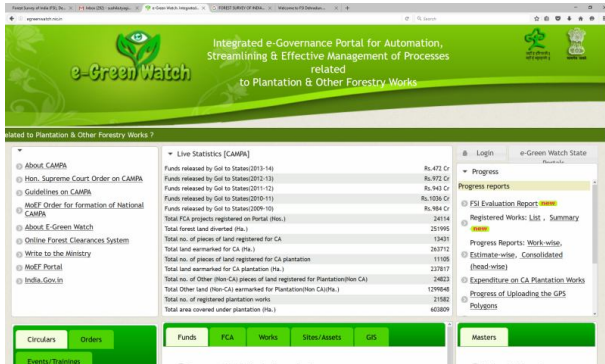
- Printing and publication of SFR, Inventory reports, training calendar, Annual reports, Van darpan (hindi journal) and other documents.
- Publicity and liaison works, organizing workshops/conferences and conducting visits of officers, trainees and dignitaries
- The Hindi cell at FSI ensures implementation of official language policy in FSI.



# INITIATIVES

## 1. E-greenwatch (since 2014)

- The primary function of CAMPA (compensatory Afforestation Fund Management and Planning Authority) is the regeneration of vegetation cover and promoting afforestation as a way of compensating for diversion of forest land to non-forest uses.
- At present there are 27 states including UT's linked to the e-Greenwatch Portal.



## Role of FSI

- Monitoring of polygons on e-Greenwatch Portal.
- Training of SFD's along with NIC.
- Monthly reporting to MoEF&CC.

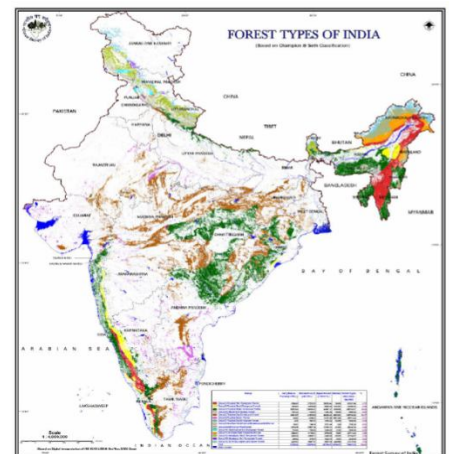
## 2. Decision Support System- 2013.

DSS is a web based GIS system to provide qualitative, quantitative and administrative attributes of forest to facilitate, inform, unbiased and expeditious decisions on forest management and clearances.



## 3. Revisiting of Forest Types

Mapping forest types of India according to Champion & Seth classification (1968) on 50,000 scale was a comprehensive exercise to delineate forest types to state and district level.



## 4. Forest Fire Monitoring



Since 2004, FSI has been carrying out near real time forest fire assessment at national level

Its objective is detection of active forest fires and dissemination of information viz. forest fire location, state, district, Survey of India toposheet numbers to SFDs through SMS and e-mail.

### Real Time Monitoring of Forest Fire

- Forest fires are monitored by using MODIS sensor data (repetivity of 6hrs/ daily).
- The fire locations with value additions are disseminated to SFDs using an indigenously developed module.
- Full automation of fire signals has been operational from 1<sup>st</sup> February 2016.

### Burnt Area assessment

- Conduct burnt area and its severity assessment using AWiFS for every fire season since 2015

### Pre-warning alert system for Forest Fire

- FSI has developed an indigenous pre-warning alert system for forest fire on weekly basis to SFDs.
- The Times of India, May 16 2016, reported effective controlling of forest fire by the pre-fire alerts issued by FSI



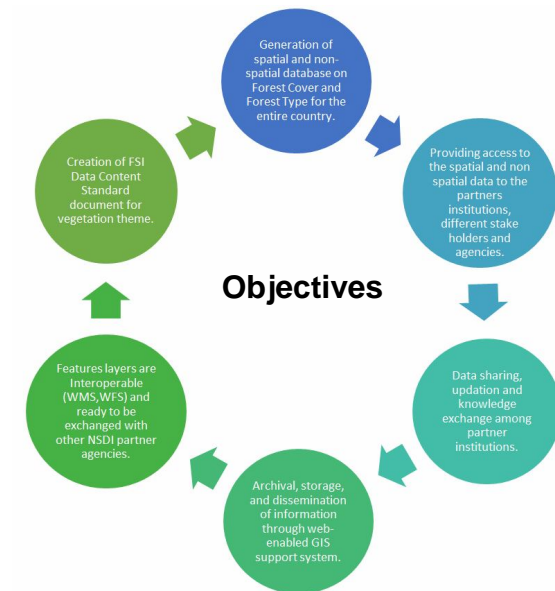
## 5. Report on Inventory of TOF in Jammu and Kashmir. 2011

- On requisition from J&K Forest dept., estimation of number of stems and volume of wood in TOF of 12 districts of J&K was carried out. Total estimated stems is 86.48 million (83.44mi in rural and 3.04 mi in urban areas). Total estimated growing stock (volume) of wood is 16.01mi cum.



## 6. NATIONAL SPATIAL DATA INFRASTRUCTURE (NSDI)

- NSDI is a national endeavor of generating spatial information for web supported GIS analysis.



## 7. Estimation of Growing stock in TOF of Tamil Nadu.

- Data processing is completed and report publication is in progress.

## 8. Inventory of TOF in Haryana.

- Data processing is completed and report publication is in progress.

## 9. FCM and Inventory of Forest/ Tree resources in Nagaland.

- Data processing is completed and report publication is in progress.

## INTERNATIONAL CONNECTION

- In 2002, FSI conducted a training program on TOF inventory for 13 countries of South and Southeast Asia at FSI Dehradun and prepared a training manual on TOF inventory.
- In 2004 FSI Conducted a pilot study on Assessment of Status of Sustainability of Forest Resources in India in collaboration with Food & Agriculture Organisation (FAO), Rome .
- FSI conducted a workshop on Measurement and Estimation of Carbon Stock for SAARC countries during 22-26 November, 2010 at FSI Dehradun on request of SAARC Forestry Centre Bhutan.
- FSI organized a one-week Regional Capacity Building workshop for South Asian countries during 19-23 August, 2013 at FSI Dehradun in collaboration with FAO.
- Regional capacity building programme of FAO for FRA 2015, inventory programme for Sri Lanka and Myanmar.



- FSI officials attended a training program on Forest Inventory and Carbon Estimation for FSI personnel during 29 March – 13 April, 2012 at Washington DC, Utah and Minnisota.
- An Indo-US workshop on developing Reference Baseline and scenario for forest sector inventory and carbon estimation for REDD+ at FSI Dehradun during 7-8<sup>th</sup> November, 2012.
- A study tour for FSI personnel on forecasting and modeling at Virginia Tech University and Washington DC during 1-10 December, 2013.
- One-week training program on NFI during 4-8<sup>th</sup> July, 2015 for forestry delegation of Myanmar
- FSI has undertaken a project for designing and developing NFI for Sri Lanka with the financial support of FAO.
- A Technical Cooperation Programme (TCP) in collaboration with FAO is underway to advance research in forestry and develop technical skills of forestry resources in the country.

## MAJOR PROJECTS

1. Assessment of Pasture Lands in Himalayan Alpine Pastures in the Country-1989.
2. Application of GIS in Watershed Management-1991.
3. Status of Forest Cover in Tiger Reserves- 1992-93.
4. Assessment of Burnt Areas due to Forest Fire-1995.
5. Damage Assessment due to Super Cyclone in Orissa -1999.
6. Assessment of Burnt Area in UP Hills (Uttaranchal)- 1999.
7. Forest Cover Change Assessment using Remote Sensing Technology for FRA 2000-2000.
8. Valuation and Evaluation of Trees Outside Forests (TOF) for South East Asia for FAO-FRA 2000-1999.
9. Assessment of Growing Stock, Biomass and Carbon in India's Forests- 2004.
10. Forest Cover in Tiger Reserves of India: Status and Changes- 2006
11. Rapid Assessment of Damage to Ecological Resources due to Tsunami- 2005.
12. Pilot Study on Assessment of Status of Sustainability of Forest Resources in India- 2003
13. Report on Inventory of Trees Outside Forests (TOF) in Punjab- 2006
14. Inventory of Trees Outside Forests in Uttar Pradesh- 2007
15. Inventory of Trees Outside Forests in Uttarakhand- 2008
16. Inventory of Trees Outside Forests in Karnataka- 2008
17. Assessment of Forest Cover in Adjoining Areas of the proposed Link Canal and Water Reservoirs- 2003.
18. Assessment of Coral Reefs in India- 2003.
19. Assessment of Mangroves in India- 2003
20. Near Real Time Monitoring of Active Forest Fires using MODIS Web Fire Mapper- 2004.
21. Coastal Zone Studies: Mapping at Community Level and Health Assessment of Mangrove Ecosystem- 2006
22. National Forest Type Mapping- 2006
23. Verifying Land Cover in Himachal for Carbon Credit under CDM- 2008
24. Mapping of Village-wise land use change in the Aravali Region of Haryana- 2008
25. Inventory of GHG emissions for NATCOM- II- 2008
26. Monitoring of forest cover change in tiger reserve in india-2009
27. Macro level EIA Studies of Bellary, Chitradurga and Tumkur districts of Karnataka- 2011
28. Status, Density and Change in Forest Cover of Tiger Reserves in respect of Shivalik Gangetic Plain Landscape- 2013-2015.
29. "Inventorization and Monitoring of Biosphere Reserves India" under NNRMS Scheme- 2011-15.
30. Forest Cover Mapping and Inventory of Forests /Tree Resources in Nagaland- 2012.
31. Inventory of Trees Outside Forests in five districts of Uttarakhand- 2015.



# MAJOR PUBLICATIONS

