

**CHANGE: FOR THE BETTER**  
**India State of Forest Report 2009**  
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## **Introduction**

India is the first country in the world to start an operational system for monitoring forest cover (FSI 2007). Scientific monitoring of the country's forest and tree cover is an important national priority as India places a great commitment on protecting, regenerating and growing its forests. The Forest Survey of India (FSI) is responsible for monitoring the forest resources of India. FSI has been ever active in improving and refining the technology in its assessments. In this article we explore the improvements in country's forest assessment over the years in terms of scope of the assessments to include a wider range of forest resources. We also explore improvements in presenting the information in a way to assist informed decision making. Lastly, some of the important issues have been analyzed, inclusion of which may help in making the assessments more informative.

## **Functional role of FSI**

To develop and sustainably manage adequate forest cover in the country, it is essential that the state of forest cover is monitored regularly, precisely and at relatively short time-spans. FSI, an organization under the Ministry of Environment and Forests (MoEF), is responsible for the preparation of country's forest cover map biennially. The assessments are used for monitoring of forest cover so that proper insights can be obtained for better planning of the forestry resources. The two-year cycle of mapping country's forests is considered to be sufficient for the purpose of policy and planning as the changes in periods shorter than this are likely to be insignificant.

## **Journey of FSI and improvements over the years**

Over the years, there have been significant advancements in remote sensing imagery and interpretational techniques which have been used by FSI to continuously provide more reliable and detailed information about the state of forests in the country.

As an illustration, when the forest mapping was conducted for the first time in the country (FSI 1989), Landsat images were used having resolution of 80 m. The smallest mappable

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area in that case was 400 hectares, a relatively large area to give reliable results for planning. However with advancements in satellite imagery, it is now possible to map forests with a resolution of 23.5 m using IRS-P6-LISS III sensor. Thus, now it is possible to map the forest with more accuracy and the minimum mappable area has reduced to 1 hectare. Such advancements have helped in making the assessments more objective and the analysis of changes more accurate.

<b>Table 1: Evolving Forest Assessments</b>	
<b>Year (Assessment)</b>	<b>Major improvements over the previous assessment(s)</b>
1989 (2 <sup>nd</sup> )	<ul style="list-style-type: none"> <li>• Figures such as states shaped by per capita recorded forest area and forest cover</li> <li>• Forest cover by eco-floristic zones</li> <li>• Growing stock and volume information for few regions/states</li> </ul>
1991 (3 <sup>rd</sup> )	<ul style="list-style-type: none"> <li>• Intensive ground truthing</li> <li>• State-wise legal classification of forests</li> <li>• District-wise classification of forests</li> </ul>
1995 (5 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• Data used from Indian Remote Sensing Satellite (IRS-IB) used for the assessment for the first time</li> <li>• Stratum-wise growing stock</li> <li>• Emphasis on Mangrove vegetation</li> <li>• State-wise extent of fire</li> </ul>
1997 (6 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• Forest cover in hill and tribal districts</li> <li>• Information on trees outside forests (TOF), but only for Haryana</li> <li>• District-wise total number of stems, total volume and distribution across species</li> </ul>
1999 (7 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• New Digital Image Processing (DIP) system</li> <li>• Details of number of villages in the vicinity of forests and other statistics</li> <li>• Digital method of interpretation of imagery for 13 states</li> </ul>
2001 (8 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• Assessment of forest cover for the entire country using digital method with higher resolution</li> <li>• Estimation of accuracy of forest cover classification</li> <li>• Physiographic zone and state-wise culturable non-forest area (CNFA)</li> <li>• Physiographic zone and state-wise tree cover estimates</li> </ul>
2003 (9 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• Introduction of one more density class (Very Dense Forest) in the classification of forest cover</li> <li>• Introduction of new methodology to estimate tree cover accurately</li> <li>• State-wise extent of water bodies inside forests</li> <li>• Physiographic zone and state-wise estimates of growing stock</li> </ul>
2005 (10 <sup>th</sup> )	<ul style="list-style-type: none"> <li>• State-wise statistics for forest cover within and outside forest area</li> <li>• Physiographic zone and top 10 species wise growing stock estimates</li> </ul>
Source: Compiled by authors from FSI Reports	

FSI has also been active in improving and refining the methodology in its assessments over the years. Table 1 provides a series of major improvements over the assessments covering the scope of resources as well as technological advancements.

### **Improvements in the new FSI 2009 report**

Over the years, planning in the forestry sector has suffered on account of narrow knowledge base about the state of forest resource. Owing to lack of timely and adequate information, it

has not been possible for the planners at the macro level to give precise direction in regard to various activities. The latest assessment report released by FSI however attempts to deal with this issue of inadequate information associated with the forest resources (FSI 2009). The report provides new information which is intended to provide valuable inputs into forestry sector policy and planning.

Firstly, there has been a change in methodology for forest cover mapping. The previous methodology of analyzing and interpreting the satellite imagery through raster approach has been discarded. FSI has adopted the vector approach which would help in interpreting the *changes* in forest cover more objectively and accurately. The new approach is also believed to be more helpful for analysis in a GIS framework. As the usage of GIS in natural resource management is gaining momentum, this is a welcome move.

Secondly, for the first time, India's forest cover has been mapped over 16 forest type groups. Earlier assessments had classified country's forest among these types but limitations in technology had not allowed mapping the forests over different forest types. This will be of immense help in raising public consciousness about the status of forest cover and generating informed debate on the adequacy, or otherwise, of the conservation measures over specific forest types.

Thirdly, the assessment classifies the forest cover by altitudinal zones. The assessment also acknowledges the fact that regions above 4000 meters altitude are not conducive for the growth of trees and for the first time provides information on the forest cover of the country if the *area above tree line* is exempted from the analysis. The new information will enable policy makers and planners to evolve distinct and pragmatic policies to halt degradation of valuation forests in mountain regions, especially the Himalayan states.

Fourthly, National Forestry Inventory for the country has also been prepared which includes both: forests and trees outside forests. The assessment also provides information on the growing stock at the state level. This information was provided earlier in 9<sup>th</sup> Assessment Report (FSI 2005) but for some reason was discontinued in the next assessment. Growing stock statistics are one of the important indicators of forest health and productivity. Such estimates can help in developing insights on judicious allocation of fiscal resources for greening. Effective benchmarking based on growing stock estimates can be useful as policy instruments get developed for financial transfers to compensate afforestation efforts.

The assessment report is being widely quoted and extensively used by the planners and other governmental and non-governmental organizations, research and educational institutions and regional and international organizations dealing with environment in general and forests in particular. The new information is thus likely to benefit a large number of users by providing an updated picture of the forest sector in the country. It would help to make more informed decisions about the best way to achieve sustainable forest management.

### **Some holes that can be filled up**

There has been a gradual and steady refinement in the assessment of forest resources of the country. However, considering the large audience it caters to, there are still some empty spaces that may be filled-up in future to make the report more information.

Taking a clue from the State of World's Forest (FAO 2009), the assessment can go beyond monitoring the extent of forest resources and can include other thematic elements like forest health and vitality, biological diversity, non-timber forest produce, productive, protective and socioeconomic functions of forests. Comparison of forest cover of the country with other regions or countries can be provided to have a deeper insight on the existing situation. The report may also include a chapter on the importance of forests in eradicating poverty to make it more informative. Statistics on number of villages in the vicinity of forests, human and livestock population among others can help in revealing the pressure on the existing forests of the country. Lastly, in spite of the importance of ecosystem services being acknowledged by the National Environmental Policy (NEP 2006), the latest assessment report fails to include them in its scope. Forests provide many 'life-support' services and an assessment of the same will make the report more comprehensive and useful.

### **Conclusion**

It would not be an exaggeration to say that India is witnessing an era of ecological "renaissance". On one hand, people are becoming more aware and conscious of the importance of natural resources, and on the other hand government and civil society organizations are working more efficiently to protect them. The new assessment report is a step further in this direction. It gives special emphasis to data availability with regard to policy reform, strategy formulation and programme implementation. The improvements in the current report will surely help to provide a basis for analytical study of the dynamics of forest ecosystems, thereby facilitating objective policy analysis and forestry planning processes.

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