Arunachal Pradesh

9.2.1 Introduction

Arunachal Pradesh covering an geographical area of 83,743 sq km is the largest state in the North-Eastern region of the country which constitutes 2.55% of the total area of the country. Physiographically, the state can be divided into three zones namely lower hills, lesser Himalayan range and the Great Himalayan range. The state has temperate climate in the northern part and warm humid in the southern part. 31°C. Major rivers of the state are Kameng, Subansiri, Siang, Lohit and Dibang. The State has 16 districts and all are hilly as well as tribal districts. As per Census, 2011, the total population of the state is 1.38 million which is 0.11% of the country’s population. Proportion of rural and urban population is 77.06% and 22.94% respectively with a density of 17 persons per sq km. The 19th Livestock census, 2012 has reported a livestock population of 1.41 million.

<table>
<thead>
<tr>
<th>Table 9.2.1 Land Use Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use Types</td>
</tr>
<tr>
<td>Total Geographical Area</td>
</tr>
<tr>
<td>Reporting area for land utilization</td>
</tr>
<tr>
<td>Forests</td>
</tr>
<tr>
<td>Not available for cultivation</td>
</tr>
<tr>
<td>Permanent pastures and other grazing lands</td>
</tr>
<tr>
<td>Land under Misc. Tree crops and groves</td>
</tr>
<tr>
<td>Culturable wasteland</td>
</tr>
<tr>
<td>Fallow lands other than current fallows</td>
</tr>
<tr>
<td>Current fallsows</td>
</tr>
<tr>
<td>Net area sown</td>
</tr>
</tbody>
</table>


9.2.2

Forest Cover

Based on interpretation of satellite data pertaining to Oct - Dec 2015, the forest cover in the State is 66,964 sq km which is 79.96% of the State’s geographical area. In terms of forest canopy density classes, the state has 20,721 sq km under very dense forest, 30,955 sq km under moderately dense forest and 15,288 sq km under open forest.

Forest and Tree Resources in States and Union Territories
9.2.3

Forest Cover within and outside Green Wash Area

The State has reported a recorded forest area of 51,407 sq km which is 61.30% of the Geographic area of the State. The Reserved, Protected and Unclassed Forests are 20.60%, 19.02% and 60.38% respectively, of the recorded forest area. Due to non-availability of digitized boundary of recorded forest area from the State, the updated green wash area which is 64,045 sq km has been used and the analysis of forest cover within and outside this area is depicted below.

<table>
<thead>
<tr>
<th>Table 9.2.2 Forest Cover within and outside Green Wash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Cover within Green Wash (Area in sq km)</td>
</tr>
<tr>
<td>Very Dense Forest (VDF)</td>
</tr>
<tr>
<td>Moderately Dense Forest (MDF)</td>
</tr>
<tr>
<td>Open Forest (OF)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Forest Cover outside Green Wash</td>
</tr>
<tr>
<td>Very Dense Forest</td>
</tr>
<tr>
<td>Moderately Dense Forest</td>
</tr>
<tr>
<td>Open Forest</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>Total Forest Cover</strong></td>
</tr>
<tr>
<td><strong>Tree Cover</strong></td>
</tr>
<tr>
<td><strong>Total Forest &amp; Tree Cover</strong></td>
</tr>
<tr>
<td>Of State’s Geographical Area</td>
</tr>
<tr>
<td>Of India’s Forest &amp; Tree Cover</td>
</tr>
<tr>
<td>Per capita Forest &amp; Tree Cover</td>
</tr>
</tbody>
</table>
Table 9.2.3 Altitude-wise Forest Cover (Area in sq km)

<table>
<thead>
<tr>
<th>Altitude Zone(m)</th>
<th>Geographical Area</th>
<th>VDF</th>
<th>MDF</th>
<th>OF</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 500</td>
<td>1134</td>
<td>1,406</td>
<td>1,794</td>
<td>2,044</td>
<td>4,234</td>
</tr>
<tr>
<td>500 - 1000</td>
<td>11,982</td>
<td>2,721</td>
<td>4,101</td>
<td>3,448</td>
<td>10,270</td>
</tr>
<tr>
<td>1000 - 2000</td>
<td>23,752</td>
<td>7,785</td>
<td>10,139</td>
<td>4,517</td>
<td>22,441</td>
</tr>
<tr>
<td>2000 - 3000</td>
<td>17,955</td>
<td>6,505</td>
<td>9,001</td>
<td>1,686</td>
<td>17,192</td>
</tr>
<tr>
<td>3000 - 4000</td>
<td>13,370</td>
<td>2,170</td>
<td>4,083</td>
<td>2,856</td>
<td>9,109</td>
</tr>
<tr>
<td>&gt; 4000</td>
<td>6,438</td>
<td>54</td>
<td>237</td>
<td>427</td>
<td>718</td>
</tr>
<tr>
<td>Total</td>
<td>83,743</td>
<td>20,721</td>
<td>30,955</td>
<td>15,288</td>
<td>66,964</td>
</tr>
</tbody>
</table>

(Based on SRTM, Digital Elevation Model)

Table 9.2.4 Forest Cover in different Patch Size Classes

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Patch Size Range(sq km)</th>
<th>No. of Patches</th>
<th>Area (sq km)</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≥ 0.01 ≤ 1.0</td>
<td>30,524</td>
<td>2,019</td>
<td>3.02</td>
</tr>
<tr>
<td>2</td>
<td>&gt; 1.0 ≤ 10</td>
<td>509</td>
<td>1,500</td>
<td>2.24</td>
</tr>
<tr>
<td>3</td>
<td>&gt; 10 ≤ 100</td>
<td>51</td>
<td>1,470</td>
<td>2.19</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 100 ≤ 500</td>
<td>2</td>
<td>846</td>
<td>1.25</td>
</tr>
<tr>
<td>5</td>
<td>&gt; 500 ≤ 1000</td>
<td>1</td>
<td>583</td>
<td>0.87</td>
</tr>
<tr>
<td>6</td>
<td>&gt; 1000 ≤ 5000</td>
<td>2</td>
<td>3,070</td>
<td>4.59</td>
</tr>
<tr>
<td>7</td>
<td>&gt; 5000 ≤ 10000</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>&gt; 10000</td>
<td>2</td>
<td>57,974</td>
<td>85.83</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>31,091</td>
<td>66,964</td>
<td>100</td>
</tr>
</tbody>
</table>

Forest and Tree Resources in States and Union Territories
Table 9.2.5 Growing Stock

<table>
<thead>
<tr>
<th></th>
<th>Growing Stock</th>
<th>% Contribution to country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing Stock in Recorded Forest Area</td>
<td>420.793 m cum</td>
<td>9.97</td>
</tr>
<tr>
<td>Growing Stock in TOF</td>
<td>90.695 m cum</td>
<td>5.66</td>
</tr>
<tr>
<td>Potential Production of industrial wood from TOF</td>
<td>0.79 m cum</td>
<td>1.06</td>
</tr>
<tr>
<td>Bamboo bearing area within forest area of the state</td>
<td>1,512.5 sq km</td>
<td>9.64</td>
</tr>
<tr>
<td>Total number of culms</td>
<td>4,048 millions</td>
<td>14.40</td>
</tr>
<tr>
<td>Total green weight equivalent of culms</td>
<td>18,863 (000' tonnes)</td>
<td>9.99</td>
</tr>
</tbody>
</table>

9.2.4

**Carbon Stock in forest**

The total Carbon stock of forests in the State is 994.539 million tonnes (3646.643 million tonnes of CO₂ equivalent) which is 14.04% of total forest carbon of the country.

9.2.5

**Decadal Change in water bodies within Forest**

A decrease of 195 sq km has been observed in the water body coverage within Forest compared to 2005. The graphical and tabular comparison is depicted below.

Table 9.2.6 Water bodies within Forest for the years 2005 and 2015

<table>
<thead>
<tr>
<th>Area/Coverage</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of water bodies (sq km) within Forest</td>
<td>582</td>
<td>387</td>
</tr>
<tr>
<td>% of water bodies to Forest Cover</td>
<td>0.86</td>
<td>0.58</td>
</tr>
</tbody>
</table>
Table 9.2.7 District-wise Forest Cover (area in sq km)

<table>
<thead>
<tr>
<th>District</th>
<th>Geo-graphical Area</th>
<th>2017 Assessment</th>
<th>Total</th>
<th>% of GA Change</th>
<th>Scrub</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Dense Forest</td>
<td>Mod. Dense Forest</td>
<td>Open Forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changlang</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dibang Valley*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Dibang Valley*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Kameng*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Kameng*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Siang*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kurung Kumeyp*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Subansiri*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lohit* &amp; Anjaw*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papum Pare*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tawang*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tirap*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Very Dense Forest
- Moderately Dense Forest
- Open Forest
- Scrub
- Water Bodies
- Non Forest
- International Boundary
- State Boundary
- District Boundary
- Capital

Figure 9.2:
Forest Cover map of Arunachal Pradesh

Forest and Tree Resources in States and Union Territories
<table>
<thead>
<tr>
<th>District</th>
<th>Geo-graphical Area</th>
<th>2017 Assessment</th>
<th>Total</th>
<th>% of GA Change</th>
<th>Scrub</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Dense Forest</td>
<td>Mod. Dense Forest</td>
<td>Open Forest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Siang™</td>
<td>6,590</td>
<td>1,564</td>
<td>2,152</td>
<td>1,353</td>
<td>5,369</td>
</tr>
<tr>
<td>Upper Subansiri™</td>
<td>7,032</td>
<td>1,800</td>
<td>2,324</td>
<td>1,147</td>
<td>5,571</td>
</tr>
<tr>
<td>West Siang™</td>
<td>8,325</td>
<td>2,656</td>
<td>2,749</td>
<td>1,751</td>
<td>7,356</td>
</tr>
<tr>
<td>Grand Total</td>
<td>83,743</td>
<td>20,721</td>
<td>30,165</td>
<td>15,288</td>
<td>66,964</td>
</tr>
</tbody>
</table>

### Table 9.2.6 Forest Cover Change Matrix (area in sq km)

<table>
<thead>
<tr>
<th>Class</th>
<th>2017 Assessment</th>
<th>Total ISFR 2015 updated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VDF</td>
<td>MDF</td>
</tr>
<tr>
<td>Very Dense Forest</td>
<td>20,711</td>
<td>11</td>
</tr>
<tr>
<td>Moderately Dense Forest</td>
<td>7</td>
<td>30,917</td>
</tr>
<tr>
<td>Open Forest</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Scrub</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-Forest</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Total ISFR 2017</td>
<td>20,721</td>
<td>30,055</td>
</tr>
<tr>
<td>Net Change</td>
<td>-83</td>
<td>-226</td>
</tr>
</tbody>
</table>

### 9.2.6

**Reasons for change detected in 2017 assessment**

A decrease of 190 sq km observed in the in the forest cover of the State can be attributed to shifting cultivation and developmental activities.