

# EXECUTIVE SUMMARY

India is the 7<sup>th</sup> largest country in the world with 2.4% of the world's geographic area and 1.8% of forests with a hefty 17.5% of the world's total population. Around 350 to 400M inhabitants depend upon forests for subsistence and livelihoods, due to which there is an immense pressure on this scarce natural resource. Various produce like NTFPs, fodder, fuel-wood, unrecorded forest produce, etc. contribute to the livelihoods. It is estimated that 24.39% of the total geographic area of India is under forest and tree cover.

Damage to the forests of India started in early 1800s when large scale felling of trees was done for construction. This was further accelerated by two world wars. With the formulation of working plans for forest management and evolution of forest management and conservation strategies, the efforts resulted in halting the forest degradation and contributed to the conservation of forests. Presently, the forest departments under the state governments prepare working plans in accordance with the working plan code formulated and notified by the central government. Various Acts and policies like the Wildlife Protection Act, Forest Conservation Act, Biodiversity Act, etc. have been formulated and implemented for forest protection and conservation. Additionally, schemes like JFM and Participatory Forest Management which focus on forest management with the participation of the dependent population has also been effective in the process.

## (i) FOREST AND THEIR MANAGEMENT AT THE STATE LEVEL

Each state and union administered territory has a forest department to take care of the forests in that particular State/UT. The set up comprises hierarchical territorial and functional units that ease the management of diverse resource. The territorial units take care of the territory of the forests while the functional units have special functions attached to them, like wildlife, formulation of working plans, looking after prioritized species, or issues. The functional units may differ from state to state. The entire forestry sector of the state are divided into circles, which consist of divisions comprising ranges. Each range is further divided into blocks, blocks into beats and beats into compartments. The concept of blocks may be missing in some states. In total, there are around 1,350 territorial and functional divisions in the forest departments of states/UTs under 394 circles, which includes around 6,670 forest ranges.

Working plans prepared by the working plan units of the state are generally valid for 10 years. These have been made mandatory in order to ensure the enforcement of Forest (Conservation) Act, 1980. As on March 2019, there are about 500 valid working plans and this number also changes with time as some plans expire, some are revised and some new ones are added.

The commercial activities of the forestry sector in the states are taken care of by the state owned Forest Development Corporations, established especially for the purpose. The main job of these entities is to raise plantations, enhance production and harvest, to trade in timber and non-timber forest products, to own and run forest based industries, to provide support to farmers for marketing their forest produce and to provide consultancy in forest operations. The functioning of these corporations differs from state to state. While some of the corporations are making profit, few are in loss.

The major forest areas of the states of Assam, Meghalaya, Mizoram and Tripura are owned by the tribal communities and are managed by the Autonomous District Councils (ADCs). The total area under ADCs in all these states is 18,376 km<sup>2</sup> which is almost 31% of the total forest area of these four states. The maximum is in Meghalaya (around 88%) while the minimum is in Tripura.

## (ii) PEOPLE AND FORESTS

Several vulnerable and excluded communities inhabit in and around the forests and forest fringe villages. It is estimated that around 350 to 400M people are directly dependent on forests for their various needs. As per the Census 2011, there are 4,526 forest villages with a total population of 22,06,011. The maximum are in Madhya Pradesh and the minimum in Andhra Pradesh. In addition, there are around 1,47,127 forest fringe villages (villages around the forest boundaries) in 275 rainfed districts of India.

The involvement of people in forest management is essential for forest conservation and utilisation. The JFM programme ensures participation of local communities in forest management which are entitled to get usufructs from the area managed by them. It is a part of the National Forest Policy, 1988. Various programmes and projects are implemented through the committees formed under JFM. There are more than 42,000 JFMCs in India.

In the initial stages of Forest Rights Act 2006, the states focused more on implementing the provisions for Individual Forest Rights (IFR) and by October 2010 around 29 lakh claims under IFR were filed. This figure increased to 40.54 lakh by April 2018. The maximum claims under IFR category were filed in Chhattisgarh (around 8.56 lakh) and minimum in Himachal Pradesh (2,053). Out of 40.54 lakh claims of IFRs, 17.97 lakh were recognized, increasing the percentage of recognized claims from 35% in October 2010 to 44.31% in April 2018. The claims under the Community Forest Rights (CFR) were negligible in the initial stage of Forest Rights Act 2006. However, by April 2018, almost 1.45 lakh claims under CFRs were filed, out of which 70,164 were recognized (48.53%). A maximum of 39,618 claims had been received from the state of Madhya Pradesh under CFR and none from Bihar. The maximum extent of forest land for which title were recognized was in Chhattisgarh for IFR (3.39 lakh ha) and minimum for Himachal Pradesh (2 ha). For claims under the CFRs, the maximum extent of forest land for which titles were recognized was in Maharashtra (17.95 lakh ha) and minimum for Goa (2.43 ha).

Under the agro-forestry practice, short rotation tree crops like eucalypts, casuarinas, poplars, etc. are grown. The area under agro-forestry is estimated to be around 25Mha which is equivalent to 14.20% of the total cultivated land under the practice.

## (iii) FOREST RESOURCE: PRODUCTION AND UTILIZATION

Forests provide a number of products and services and contribute to the national economy. Much of the contribution goes unaccounted for as they contribute to subsistence of the forest dependent communities and hence, are not generally measured directly. The GDP and Gross Value Addition (GVA) at basic constant (2011-12) prices for the year 2018-19 is estimated at INR 140.78 lakh Cr and INR 129.07 lakh Cr, respectively; while for the current price it is estimated at INR 190.10 lakh Cr and INR 172 lakh Cr, respectively.

FSI conducts a biennial exercise to determine the forest cover in India. The maximum recorded forest area is of Madhya Pradesh (about 30.70% of its geographical area). It is followed by Andhra Pradesh until Telangana was a part of it and, thereafter, Maharashtra (about 20% of its geographical area). Among all the states/UTs, Daman and Diu has the minimum recorded forest area (about 7.20% of its geographical area).

Some of the UTs do not have any recorded forest area. In terms of the forest cover of India, Madhya Pradesh (77,414 km<sup>2</sup> in 2017) has the maximum forest cover followed by the Arunachal Pradesh (66,964 km<sup>2</sup> in 2017) while Daman and Diu has the minimum forest cover (20 km<sup>2</sup> in 2017). The National Forest Policy 1988 sets a national objective of expanding the forest and tree cover of India to 33% of the total area of the country. As per the 2017 assessment of FSI, there are about 50% states having more than 33% forest cover. In the states, Mizoram has the highest percentage of forest cover (about 86%) followed by Arunachal Pradesh (about 80%). In the UTs, Lakshadweep has maximum forest cover (about 85%) followed by Andaman and Nicobar Islands (about 82%). Twelve states in India are known to have mangroves with an estimated area of 4,921 km<sup>2</sup>.

Based upon the available data from 2010-11 to 2016-17, maximum timber production is registered in the state of Uttar Pradesh (about 3 lakh m<sup>3</sup> year<sup>-1</sup>) followed by Jammu and Kashmir (about 2.94 lakh m<sup>3</sup> year<sup>-1</sup>).

For tendu leaves, Madhya Pradesh is considered as the largest producing state followed by Chhattisgarh and Odisha. Maximum gum production in the country is contributed by Maharashtra (about 30%) followed by Madhya Pradesh (about 21%) and Jharkhand (about 16%). The major resin producing states of India are Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir and Uttarakhand, while for lac production are Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha and West Bengal.

One of the most sought after forest products by the rural and forest dependent population is fuel wood. Based on annual average production, maximum fuel-wood production is reported in Gujarat (about 0.46 Mt year<sup>-1</sup>) followed by Karnataka (about 0.15 Mt year<sup>-1</sup>) and Maharashtra (0.09 Mt year<sup>-1</sup>). Bamboo is considered as versatile natural resource which is extensively used in cottage industry for making lots of household products, besides house construction. Bamboos are mainly found in Andaman and Nicobar Island, Arunachal Pradesh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal.

The 20 Point Programme is meant to give a thrust to schemes relating to poverty alleviation, employment generation in rural areas, housing, education, health and family welfare, protection of environment and many other schemes having a bearing on the quality of life, especially in the rural areas. The average annual target of afforestation of the country under the 20 Point Programme is about 1.6 Mha year<sup>-1</sup>. Maximum annual average target is given to the Andhra Pradesh (about 0.24 Mha year<sup>-1</sup>) followed by Telangana (about 0.20 Mha year<sup>-1</sup>). Maximum annual average achievement is observed for Telangana (about 0.31 Mha year<sup>-1</sup>) followed by Andhra Pradesh (about 0.27 Mha year<sup>-1</sup>). The average annual target of seedlings planted in the country is (about 971 M year<sup>-1</sup>). Maximum annual average target of seedlings is given to the Andhra Pradesh (about 181 M year<sup>-1</sup>) followed by Telangana (about 130 M year<sup>-1</sup>). Maximum annual average achievement of seedling planted is found for Andhra Pradesh (about 242 M year<sup>-1</sup>) followed by Gujarat (about 159 M year<sup>-1</sup>).

#### (iv) TRADE AND INDUSTRY

The Forestry and Logging sector is mentioned under the Agriculture, Forestry and Fishing section (section A) of the National Industrial Classification (NIC) 2008 at Division 02. All the activities listed under this division are allotted to the forestry sector. The wood based industry is covered in group 161 and 162 of NIC.

There are about 1,750 registered saw mills in the country which is very less when compared to the actual number of saw mills present. The pulp, paper and paperboard units are 1,185 across 25 states/UTs with maximum in Tamil Nadu (191) and minimum in Tripura (1). The 2,238 units manufacturing plywood, veneer and composite wood are spread over 27 states, highest being in Kerala (517) and lowest in Manipur (1).

Although international trade in forest products includes several products, the main ones are given in Table 1.

**Table 1. Details of export and import of important forest produce (2010-18)**

Produce	Unit	Type	Year							
			2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Wood in rough	'000	Export	26.64	10.34	5.61	8.40	4.85	7.19	3.08	5.70
	m <sup>3</sup>	Import	4,664.28	6,167.56	6,536.29	6,078.67	6,112.09	5,622.15	4,703.27	4,877.55
Sawn wood	'000	Export	17.18	32.38	34.15	50.26	26.73	39.24	23.41	12.19
	m <sup>3</sup>	Import	192.20	495.24	499.52	524.81	605.46	764.60	708.85	1,044.66
Veneers	t	Export	13,173.13	9,363.19	6,072.03	3,483.88	8,404.86	5,750.17	4,803.96	4,451.79
		Import	27,773.42	14,414,552.22	90,727.52	1,38,466.31	2,04,406.49	2,89,517.86	3,12,186.80	3,25,562.11
Plywood	t	Export	175.94	84.12	52.09	131.24	120.77	149.22	226.74	231.38
		Import	328.72	386.42	301.72	186.45	204.05	181.54	158.57	230.82
Wood Coal	t	Export	20,473	29,096	32,995	41,215	80,817	22,220	39,072	26,919
		Import	2,337	1,277	1,09,192	11,721	15,313	17,467	2,776	1,627
Resins	t	Export	6,033.10	7,097.16	5,126.83	9,163.58	6,412.12	7,855.83	7,739.95	7,741.31
		Import	6,341.55	4,307.75	6,250.80	3,494.16	20,536.00	4,981.05	3,779.91	3,519.49
Bamboos	t	Export	217.76	136.41	61.51	30.73	53.87	2.05	27.30	10,067.01
		Import	2,069.10	4,268.25	7,007.31	10,789.95	16,675.60	20,437.25	27,524.61	26,929.81
Particle Board	t	Export	1,499.26	243.46	683.21	351.89	919.79	3,287.39	1,923.88	2,756.30
		Import	1,36,347.59	1,66,737.91	1,16,645.43	1,11,649.86	1,13,189.16	1,13,451.09	1,23,508.19	1,11,804.81

#### (v) CONSERVATION OF FORESTS, WILDLIFE AND BIODIVERSITY

The country's area is classified into ten bio-geographical zones based on the flora and fauna, namely, Trans-Himalayan, Himalayan, Indian Desert, Semi-Arid, Western Ghats, Deccan Peninsula, Gangetic Plains, Coasts, North-East and Islands. Various programmes are run for conservation of forests and related issues like wildlife and biodiversity. A special force known as the Eco-Task Force has also been raised under the Territorial Army of the Indian Army to contribute in conservation measures. There are 6 battalions of this force which has so far planted more than 18 lakh plants covering an area of over 1,900 ha in Uttarakhand, Rajasthan, Jammu and Kashmir and Assam.

In order to provide a momentum to biodiversity conservation, Biodiversity Management Committees (BMC) have been formed and People's Biodiversity Registers (PBR) prepared. Up to February 2019, there were about 1.40 lakh BMCs and 6,449 PBRs in the country. There are 17 large, 25 medium, 35 small and 83 mini (which includes 16 rescue centres) zoos in the country. There are 14 biodiversity heritage sites. About 1,000 Protected Areas (including Marine), which are under biotic pressures and are inhabited or surrounded by human settlements in the form of forest villages or forest fringe villages, spread across various categories as given in Table 2.

**Table 2. India's Protected Areas (including Marine)**

S. no.	Component	Number	Area (km <sup>2</sup> )
1	National Parks	104	40,501.13
2	Wildlife Sanctuaries	551	1,19,775.80
3	Conservation Reserves	88	4,356.49
4	Community Reserves	127	525.22
5	Marine Protected Areas	131	9,801.13

Initiated in 1973, Project Tiger is a flagship project that aims at conservation of tiger along with regenerating forest eco-system and its biodiversity. It is a centrally sponsored scheme that covers 50 tiger reserves in 17 states. There are about 3,000 tigers in the country in 2018. The rise in tiger population was in conformity with the average annual growth rate of tigers since 2006. Madhya Pradesh (526) counted highest number of tigers closely followed by Karnataka (524). In general, the tiger mortality due to poaching has decreased from 2012 to 2018. During the reporting period, out of total 657 mortality cases, maximum cases were found due to natural deaths (48%) followed by the poaching (21%) and under scrutiny (13%). Similarly, Project Elephant is also being implemented to address the threats to the pachyderm for their valued tusk and also to reduce the deaths due to accidents by trains running in forest areas. There are about 30,000 estimated wild elephants in the country, maximum in Karnataka (6,049) followed by Assam (5,710) and Kerala (5,706). The constant increase is found from 2007 to 2017 in some of the states.

Programmes are also being run for conservation of 14 critically endangered species which include snow leopard, gharial, vultures, etc. IUCN, Snow Leopard Conservancy India Trust and WWF India are the important organizations which estimates these critically endangered species. Areas with unique and rich biodiversity have been identified and named as Biosphere Reserves. Eighteen biosphere reserves have been notified from 1986 to March 2019. Eleven biosphere reserves have been included by UNESCO in the World Network of Biosphere Reserves (WNBR). The latest biosphere reserve which is included in WNBR is Khangchendzonga in Sikkim. The conservation of wetlands has been taken up under the Ramsar convention. As on February 2019, 27 Ramsar sites have been declared in India covering an area of 11,121.31 km<sup>2</sup>.

The human-wildlife conflict has substantially increased in India in the past half a century, mainly owing to an increase in human population, shrinking of habitat of wildlife due to encroachments and opening of forests for road construction and other reasons. Alternately, there has been increase in population of wild elephants due to strong and strengthened conservation practices. From the available data, maximum instances were found in the central Indian states (Chhattisgarh, Madhya Pradesh and Maharashtra).

Maximum number of human deaths were reported in Assam, while, maximum human were injured in Madhya Pradesh. The maximum cattle deaths were reported in Maharashtra.

#### (vi) FUNDING OF THE FORESTRY SECTOR

There are four main sources of funding of the forestry sector, namely, Central Government, State Governments, Externally Aided projects and Soft loans from agencies like DFID, FAO, ITTO, UNDP, World Bank, etc. The total plan expenditure of the sector during XI plan, including all the wings (Environment, NRC, Forests and Wildlife, NAEB and Animal Welfare), was INR 8,470.22 Cr against an outlay of INR 9,231 Cr. During the XII plan, the outlay was increased to INR 17,874 Cr and up to 31<sup>st</sup> January 2014, the expenditure was INR 1,700.08 Cr.

Since 2009, the MoEF&CC has started financing the states from the CAMPA fund for plantation and conservation works. From 2010-11 to 2017-18, the amount disbursed by CAMPA is to the tune of INR 10,357.51 Cr. The funds are released to the states based on the proposals and Annual Plans of Operations. From 2010-11 to 2017-18, Odisha received the maximum fund (INR 1,450.09 Cr) followed by Chhattisgarh (INR 1,170.03 Cr) and Jharkhand (INR 958.12 Cr). These states are fairly distributed geographically, however, north-east and south regions are relatively less represented. The three UTs (Daman and Diu, Lakshadweep and Puducherry) and one state (Nagaland) did not receive any fund.

The NAEB also provides funds to the state forest departments for tree planting, afforestation, eco-restoration and other activities related to eco-development. During 2010-11 to 2018-19, out of INR 1,636.65 Cr, maximum fund was allocated to Maharashtra (INR 182.61 Cr) while no fund was allotted to Goa. Three states, namely, Arunachal Pradesh, Punjab and Telangana received less than INR 10 Cr during the period. During 2016-17, almost half of the states/UTs did not receive any fund under NAP scheme. In general, the NAEB funding to the states has been on decline since beginning. Two conspicuous dips in funding were observed in 2012-13 and 2015-16. The money flow remained practically static between 2010-11 to 2011-12, 2013-14 to 2014-15 and 2017-18 to 2018-19.

GIM activities started in the financial year 2015-16. So far, fund amounting to INR 237.07 Cr. have been released to twelve states from 2015-16 to 2018-19. These are Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Odisha, Punjab, Sikkim and Uttarakhand.

Funding under various other schemes is also done. The funds under the Intensification of Forest Management Scheme (IFMS) and Integrated Development of Wildlife Habitats (IDWH) have been provided. During 2010-11 to 2018-19, the total expenditure under IFMS is about INR 400 Cr against the budget estimate of INR 519 Cr. There has been inconsistent funding under IDWH over the period of 2010-11 to 2018-19. If funding is averaged over the entire reporting period, then, Kerala was the highest beneficiary of IDWH fund amounting to INR 89.32 Cr (11% of the total amount received during reporting period). Two UTs (Dadar and Nagar Haveli and Daman and Diu) received no funds.

There are some externally aided projects, mainly funded by JICA, AFD, GIZ and KfW, handled by the centre and states. Among JICA projects, Haryana took the lead way back in the year 2004-05 with an amount of INR 286.00 Cr. The latest project (2018-19 to 2027-28) is run by Himachal Pradesh and Tripura amounting INR 800.00 Cr and INR 998.40 Cr, respectively. Till date; Rajasthan has the largest JICA funded project worth INR 1,152.53 Cr (2011-12 to 2020-21). The JICA projects, in general, are confined to afforestation, biodiversity conservation and wildlife, poverty alleviation, capacity building, catchment management etc.

The data on revenue generation by different states is insufficient. Madhya Pradesh earned the maximum average revenue of INR 929.44 Cr year<sup>-1</sup> followed by Uttar Pradesh (INR 382.34 Cr year<sup>-1</sup>). As expected, the revenue for small states and UTs has been relatively small, for example, it was Rs 0.02 Cr year<sup>-1</sup> for Puducherry.

### (vii) RESEARCH AND DEVELOPMENT IN THE FORESTRY SECTOR

Forestry sector is a scientific sector and depends upon advanced scientific and technical inputs. Indian Council of Forestry Research and Education (ICFRE) with its 9 institutes and 5 centres is the apex body of forestry research in India. It works on a wide range of forestry and environment related research issues and is also the nodal body for forestry education being provided in various universities in India. Presently, there are 156 ongoing research projects (plan projects) and 98 externally aided projects. For extending forestry knowledge to the common man, ICFRE runs 26 *Van Vigyan Kendras* and has 9 Demo villages (one under each institute). Moreover, 18 Indian universities are running forestry courses with the support of council. The Forest Research Institute is also a Deemed to be University to provide forestry education and is the only university in India completely focussed on forestry and environment. It runs master's and doctoral degree courses in forestry and allied disciplines.

The Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru was established on an initiative taken by the Indian plywood industry with its mandate to carry out research and development, training and education, testing and standardization and extension activities in the field of wood and panel products from all sorts of lignocelluloses including bamboo and agro-residues. Multidisciplinary research projects are taken up based on the problems identified by the industry and inputs received from scientists and other interested stakeholders. The Wildlife Institute of India, Dehradun is a premier training and research institute in the field of wildlife and protected area management. The Forest Survey of India, Dehradun is mandated to survey the forests and uses remote sensing technology to estimate forest and tree cover on a biennial basis. Besides, it also hosts the e-Green Watch and Decision Support System to provide qualitative and quantitative information with respect to forest area.

The research activities of Indian Institute of Forest Management (IIFM), Bhopal are focussed on application of management concepts, tools and techniques that have the ability to assist a forest manager in achieving effectiveness, efficiency and sustainability in forestry operations. The Botanical Survey of India (BSI), Kolkata is the apex research organization for carrying out taxonomic and floristic studies on wild plant resources of the country by undertaking surveys, documentation and conservation. Similarly, Zoological Survey of India (ZSI) is mandated to carry out such studies for wild faunal resources.

States also have their research set-ups as state forest research institutes or research wings. The main states having such set-ups under the state forest departments are Arunachal Pradesh, Madhya Pradesh, Punjab, Uttarakhand and Uttar Pradesh. The Kerala Forest Research Institute (KFRI) caters to the forestry research of Kerala and is established under the KSCSTE.

### (viii) CAPACITY DEVELOPMENT

MoEF&CC facilitates institutional and individual capacity building to develop skills, knowledge and the ability to engage in the forest conservation, management and utilization. Induction programmes for the probationary officers of the IFS and SFS are handled by two bodies, viz., the IGNFA and the DFE. While IGNFA is providing induction and mid-career training (MCT) to the officers of the IFS; DFE is responsible for the training of the SFS and FROs. IGNFA, on an average, has trained more than 75 probationers every

year (including foreign probationers) during the reporting period of FSRI 2019. On the other hand, about 97 SFS officers and 375 FROs were trained annually by the DFE and other state forest training institutes. There are national and state level forestry institutions which are actively involved in the capacity development of forestry personnel.

The MoEF&CC has implemented JICA aided project 'Capacity Building for Forest Management and Training of Personnel' during 2011-18 with the objective of strengthening human resource development for sustainable forest management. This was a unique project in which the soft loan amount was transferred to the central academies of state forest services and 13 participating states.

### (ix) VULNERABILITY AND MITIGATION

Forests are under constant threat due to several reasons like forest fires, encroachment, diversion of forestry land for non-forestry purposes, various offences committed in forests like poaching, illegal felling of timber, etc. It is reported that almost 90% of the fires are caused by manmade factors. During 2010-11 to 2018-19, out of 1,94,466 incidences, the maximum number of forest fires occurred in Odisha (20,308) followed by Chhattisgarh (18,854) and Madhya Pradesh (18,493). No incidences were reported from Daman and Diu and Lakshadweep. Forest fires in Manipur, Meghalaya, Mizoram, Nagaland and Odisha are mainly due to practice of shifting cultivation. From the available data, maximum average burnt area is of Maharashtra (35,220.86 ha year<sup>-1</sup>) followed by Gujarat (33,133 ha year<sup>-1</sup>).

Forestry land has to be diverted for non-forestry purposes for constructing roads, dams, laying transmission lines, irrigation, mining, power plants, etc. From 2010-11 to 2018-19, 1,48,359.42 ha of forest land was diverted for 7,362 cases belonging to various purposes. Maximum land was diverted for the purpose of mining (50,612.16 ha, 34.11%) followed by irrigation (24,134.96 ha, 16.27%). In terms of states, maximum number of cases approved for diversion of forestry land was in Haryana (2,058 cases with 3,020.92 ha area) and the maximum area diverted during the entire period was in Madhya Pradesh (24,783.68 ha for 423 cases approved). Diversion of area fluctuated substantially over time having two peaks during 2014 and 2018 and dips in 2012, 2016 and 2019.

### (x) CONTEMPORARY ISSUES IN THE FORESTRY SECTOR

Forestry sector is recognized as huge carbon sink and plays a crucial role in climate change mitigation. Carbon stocks in India's forests were estimated to be 6,071 Mt in the year 1994 and 6,663 Mt in 2004. In 2015, estimated carbon stock in forest was 7,082 Mt while in 2013 it was 7,044 Mt which is a net increase of 38 Mt in country's carbon stock within two years. LULUCF sector was a net source of CO<sub>2</sub> in the year 1994 accounting for 1.16% of CO<sub>2</sub>eq of total national emissions when India submitted its first NATCOM to UNFCCC in 2000. In its second NATCOM, LULUCF sector was a net sink of 17% of total national emissions. India's first biennial update report to UNFCCC has reported that the LULUCF sector was a net carbon sink offsetting 252.5 Mt of CO<sub>2</sub>eq which is about 12% of India's total GHG emission. Thus, forestry sector in India is making positive contribution for climate change mitigation. In REDD+, the 'plus' sign is for forest conservation and sustainable management of forests and recognizes the importance of forest conservation. India's forestry sector Nationally Determined Contribution aims to create an additional carbon sink of 2.5 to 3.0 Bt of CO<sub>2</sub>eq through additional forest and tree cover by 2030.

Planned afforestation has been seen as a major mitigation strategy in forestry sector. India is one of the few countries where forest and tree cover has increased in recent years transforming country's forests into a



net sink owing to national policies aimed at conservation and sustainable management of forests. Forests and tree cover has increased from 23.4 in 2005 to 24.4% (in 2017) of the geographical area. Forestry contribution to India's NDC can be achieved through effective implementation of policies and programmes.

