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Editorial

Indian Forests in Comatose

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India has 2.5 percent of global earth share which supports 7.8 percent of global biodiversity and 18 percent of the world population (Ministry of Environment and Forests, 2009). India is one of the 17 mega biodiversity countries with a very rich flora and fauna. There are 55048 recorded plant species which constitutes 11.8 percent of the world flora (Ministry of Statistics & Programme Implementation, 2022). Out of the 55048 recorded plant species, 18,500 plants are recorded as angiosperms of which 32 % are endemic to India. India is very rich in faunal biodiversity also and has 1,03258 animal species which accounts for 6.45% of the world's recorded fauna (Ministry of Statistics & Programme Implementation, 2022). India being one of seventeen megadiverse countries, is home to 7.6% of all mammalian, 12.6% of all avian, 6.2% of all reptilian, 11.7% of all fishes, and 4.4% of all amphibians (Stephen et al., 2015). The biodiversity in Indian forests has not been fully identified as yet therefore, therefore, its loss cannot be assessed in terms of its contribution and function in an ecosystem in case the forest area is shrinking on account of multiple reasons. The total forest and tree cover of the country is 80.9 million hectares which is 24.62 % of the geographical area of the country (Ministry of Environment, Forest and Climate Change, 2021). As compared to the assessment of 2019, there is an increase of 2,261 sq. km in the total forest and tree cover of the country (Ministry of Environment, Forest and Climate Change, 2021). Out of this, the increase in the forest cover has been observed as 1,540 sq. km, and that in tree cover is 721 sq. km. The Coastline of India is very long and runs approximately 7516 km long, with nine coastal states, four union territories, and two groups of islands. The Coastline of India borders the Arabian Sea and the Indian Ocean in the west and the Bay of Bengal in the east. Among all the states, the longest Coastline in India is Gujarat, while in the UTs, the largest coastline is of Andaman and Nicobar Islands. There are twenty coastal cities with 40 million people engaged in fisheries which contributes 1 % of GDP.

All parameters of a healthy forest are down in India

The quality of Indian forests has declined over the last five years in all the parameters. The Government of Indian religious biennial report called India State Forest Report gives a detailed account of the State of Forest in India. The latest (Ministry of Environment, Forest and Climate Change, 2021) claims a marginal increase of 0.22% in the country's forest cover from its last assessment carried out in the year 2019. Closer analysis of the report says that between 2019 and 2021, the quality of India's forest has deteriorated across 15183 Sq.km of forest were either cut down or thinned out (Ministry of Environment, Forest and Climate Change, 2021). The Global Forest Watch Report published in 2024 also reveals that India has lost a staggering figure of 414000 hectares of humid primary forest, which constitutes 4.1% of the total tree cover between 2002 and 2023 (Global Forest Watch Report, 2024). The report further adds that a striking 95% of

the tree cover in the natural forest has been lost in India between 2013 and 2023. But the maximum tree cover loss of 189000 hectares was found to be in the year 2017 followed by 175000 hectares in 2016 and 144000 hectares in 2023. The report finds that the five Indian states account for 60% of all the tree cover loss reported between 2001 and 2022. Of all the five States Assam has been reported to lose maximum tree cover at 324000 hectares beside Mizoram, Arunachal Pradesh, Nagaland, and Manipur also registering significant high losses. Recently an article published by Nature Sustainability revealed that in the last three years from 2019 to 2020, India has lost close to 5.8 million fully-grown trees in agricultural lands (Brandt et al., 2024). This is also reported that 56% of India is covered by farmland and 24.56% with forest cover which also includes forest cover in areas other than recorded forest area, therefore, such a huge loss of trees in farmland is very critical to the forest ecosystem. Forest health seems to be extremely bad and Indian forests seem to be comatose. Forest health is defined by the Society of American Forests as 'the perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of un-usual levels of insects or disease, and resilience to disturbance (Finley & Chhin, 2016). Ecosystem services are the benefits obtained from ecosystem that are quintessentially linked to human well-being (Costanza et al. 1996; Reid, et al., 2005; Dorell et al., 2010). Ecosystem goods include food fiber, medicinal plants, genetic resources, and services expressed as pollution control, soil carbon, recreation, water, disease control, etc. Ecosystem goods and services are extremely important for the survival of humanity. There are many tangible and intangible benefits from the forest ecosystem but the goods and services are diminishing substantially over some time. The growth rate of the forest cover does not entail the complete story. The forest fire has gone up by 25% in the last three years and 36% of the Indian forest is prone to forest fire of which 6% forest is very highly prone to forest fire and 4% is extremely prone to forest fire (Ministry of Environment, Forest and Climate Change, 2021). The Global Forest Watch Report 2024 also says that forest fire is responsible for the loss of 1.6% of tree cover loss in India between 2001-2023 and the year 2008 saw a loss of 3,000 hectares of forest fire (Global Forest Watch Report, 2024). This has been estimated that 45%-64% of Indian forests may be impacted by climate change by the turn of 2030 (Ministry of Environment, Forest and Climate Change, 2021). ISFR 2019-21 says that 66% of the Indian State and Union Territories have seen a decline in very dense forests and moderately dense forests (Ministry of Environment, Forest and Climate Change, 2021). Yet another report published by a UK-based utility bidder reveals that India has recorded the second-highest rate of deforestation in the last 30 years and lost 668400 hectares of forest cover (Utility Bidder Report, 2023). The recent (Global Forest Watch Report, 2024) also reveals that India has lost 2.33 million hectares of tree cover since the year 2000 - 2023 and this loss amounts to a 6% decrease in tree cover, the report further adds that the loss of humid primary forest has been found to the tune of 4.1% between 2002 and 2023 and a striking 95% the tree cover loss in India has been reported in between 2013 and 2023. The maximum tree cover loss of 189000 hectares occurred in 2017 which is closely followed by 175000 hectares in 2016 and 144000 hectares in 2023. The report also finds that five Indian States namely Assam, Mizoram, Arunachal Pradesh, Nagaland, and Manipur accounted for 60% of forest cover loss between 2001 and 2023. Of the five States Assam lost a maximum of 324000 hectares of forest between 2001 and 2023. The important components of the forest ecosystem are soil depth, humus, soil organic carbon, and regeneration of the forest (Ministry of Environment, Forest and Climate Change, 2013; Ministry of Environment, Forest and Climate Change, 2015). Overall, at the national level above 67% of the forest area has medium to deep soil depth and 32% of the forest area has shallow to very shallow soil depth. Similarly, tropical moist deciduous forests, tropical dry deciduous forests, and tropical thorn forests either have no humus or very shallow humus which is directly proportional to the productivity of the forest areas in question. Soil Organic Carbon is related to soil fertility. At the national level, this has been found that alpine areas have the highest soil organic carbon per unit area while tropical thorn and tropical dry deciduous forests have the lowest soil organic carbon. The process of natural regeneration is an extremely important component of the forest ecosystem, this process helps in replacing old crops with the younger generation. At the

national level, natural regeneration is found to be inadequate or absent in 45% of the forest area which is much lower by any standard. Regeneration is also defined by the size of the forest crop in different forest groups and the Ministry of Environment, Forest and Climate Change (2013) has revealed that the percentage area under the 'big timber' size class is maximum for Himalayan dry temperate forests (41.94%) followed by Himalayan Moist Temperate forests (39.90%) and sub-Alpine forests (30 %). most of the tropical thorn forests and littoral and swamp forests are either in regeneration class or in pole crop class. The montane wet temperate forests have having maximum of 66.65 % area under 'mixed size class 'which may be considered a positive sign from a population structure angle point of view.

Land transfer cases

The Government of India has not been transparent on the transfer of forest land in the last 10 years. Forest Conservation Amendment Act (2023) was passed to be able to ease the process of forest land transfer by amending the definition of forest itself. The Government of India has approved 1,21781.60 hectares of forest land between 2015 and 2023 and in reply to a question in the parliament, the government accepted that 1,20,00,000 trees have been cut down between 2014 and 2023. Many other parameters define our forest as "not in good health", for example, the size of the wetland area in the recorded forest area has declined by 35.49% between 2019 and 2021 and growing stock has also come down by 20.93% during the same period. The Indian forests seem to be in distress and need immediate attention in the form of policy intervention because the forest does not need us but we need forest for our survival. Today, the forest has been at a critically low point and almost reached a tipping point, and in some forest types, it has tipped for sure. This is relevant to examining eastern Himalayan hill Sal (Shorea *robusta*) forests to understand the permanent changes being brought in the Indian forests. Kamrup and Khasi hill Sal in the (Eastern Himalayan Sal region) forests are now dominated by Tak (*Tectona grandis)* and some semi-evergreen species, with very few individuals of Sal species. East Himalayan bhabar sal is also found to have associated dominant species, like *Lagerstroemia microcearpa* (syn. *L. lanceolata*) and *Aphanamies polystachya* (syn. *Amoora rohituka*). Peninsular (Coastal) Sal forests have indicated the decline of Sal and its complete absence from some of the areas in coastal Odisha. Moist peninsular high-level Sal has shown the occurrence of the dry teak type in the stand in place of Sal. The present status of teak forests has also shown some disturbing results about density and regeneration status. Over-exploitation, invasion of weeds, recolonization of undergrowth, and management intervention are possible causes for the decline of the teak. India has seen rapid deforestation in recent years, primarily due to its focus on economic development. 14,000sq km of forests were cleared to accommodate 23,716 industrial projects across India over the last 30 years. Forest encroachments in India are increasing at an alarming rate with government data placed on the floor of the parliament indicating a whopping 146 % rise in a year. From 3,03,324.18 hectares in 2022, the encroachments have risen to 7,45,591 hectares in 2023. The problems of the bigger dimension the country is facing today are the loss of net primary productivity of the forests, diminishing forests, and the capital itself that is forest land.

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