

Forest Genetics and Tree Breeding

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More than 10 million different species of animals, plants, fungi and other micro-organisms inhabit the Earth. They and the habitats in which they live represent the world's biological diversity. It has been recorded that humans use about 40,000 species of plants and animals for food, shelter, clothing and medicinal needs. Forests are the most diverse ecosystems on land, because they hold the vast majority of the world's terrestrial species. Priceless biodiversity is threatened by deforestation, forest fragmentation and degradation, hunting and the arrival of invasive species from other habitats. We are losing the invaluable treasure at an alarming rate that, it has been estimated that, within the next 10 years, one out of every four known species may have been wiped off the planet. It has also been estimated that to meet the innumerable demands that humans make on nature each year, we may require about more than an additional half of Earth. That is about 1.6 earths to satisfy our greeds!

In 2019, the world lost 38 lakh hectares of tropical primary forest, which is equivalent to losing a football ground area of forests every six seconds. The term Primary forests is used to describe some of the densest and ecologically significant forests in the world and are particularly important for carbon storage and biodiversity. Global Forest Watch reported that Southeast Asia is among the hardest hit areas along with South America and Africa. Loss of primary forest was 2.8% higher in 2019 than the previous year. An increasing trend in the loss of biodiversity is evident from various reports and analyses. Despite many efforts to halt deforestation, the loss of forests was too high for the last two decades.

It is heartening to know about the increase in forest area in India. The recent assessment by the Forest Survey of India shows an increase of 5188 sq km of forest and tree cover at the national level, an increase of 0.65% over the previous assessment in 2017. The top five states in terms of increase in forest cover are, Karnataka, Andhra Pradesh Kerala, Jammu and Kashmir and Himachal Pradesh. The mangrove cover also has increased by 54 sq km in the country. Among the 12 major mangrove habitats in India, the positive trend could be observed in the states of Gujarat, Maharashtra and Odisha.

Assessment of biodiversity in forests is important since it provides and indicator to represent the state of conservation of forest ecosystems and it can help to evaluate and monitor the sustainability of the biological resources. During a rapid assessment of biodiversity during 2018-2019 with over 8500 sample plots across the country, the forest survey of India has reported 3794 species of trees in Indian forests. Karnataka (325), Tamil Nadu (252), Andhra Pradesh (242), Kerala (238) and Odisha (192) were the top five states in terms of tree diversity. Madhya Pradesh with the largest forest cover in the country recorded 146 tree species. With reference to the species richness, Arunachal Pradesh topped the list with 737 followed by Tamil Nadu (652), Karnataka (505), Jammu and Kashmir (478) and Kerala (477), out of the 9205 total species including trees, shrubs and herbs altogether. At the same time, during an assessment of sacred groves of a non-forested region in Kerala alone, covering an area of mere 0.84 sq km, flowering plants numbering 687 had been recorded. Therefore, the numbers are in-

dicative and many more could be found if a detailed enumeration is undertaken. And wild relatives of cultivated species may turn vital for further species improvement programmes.

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