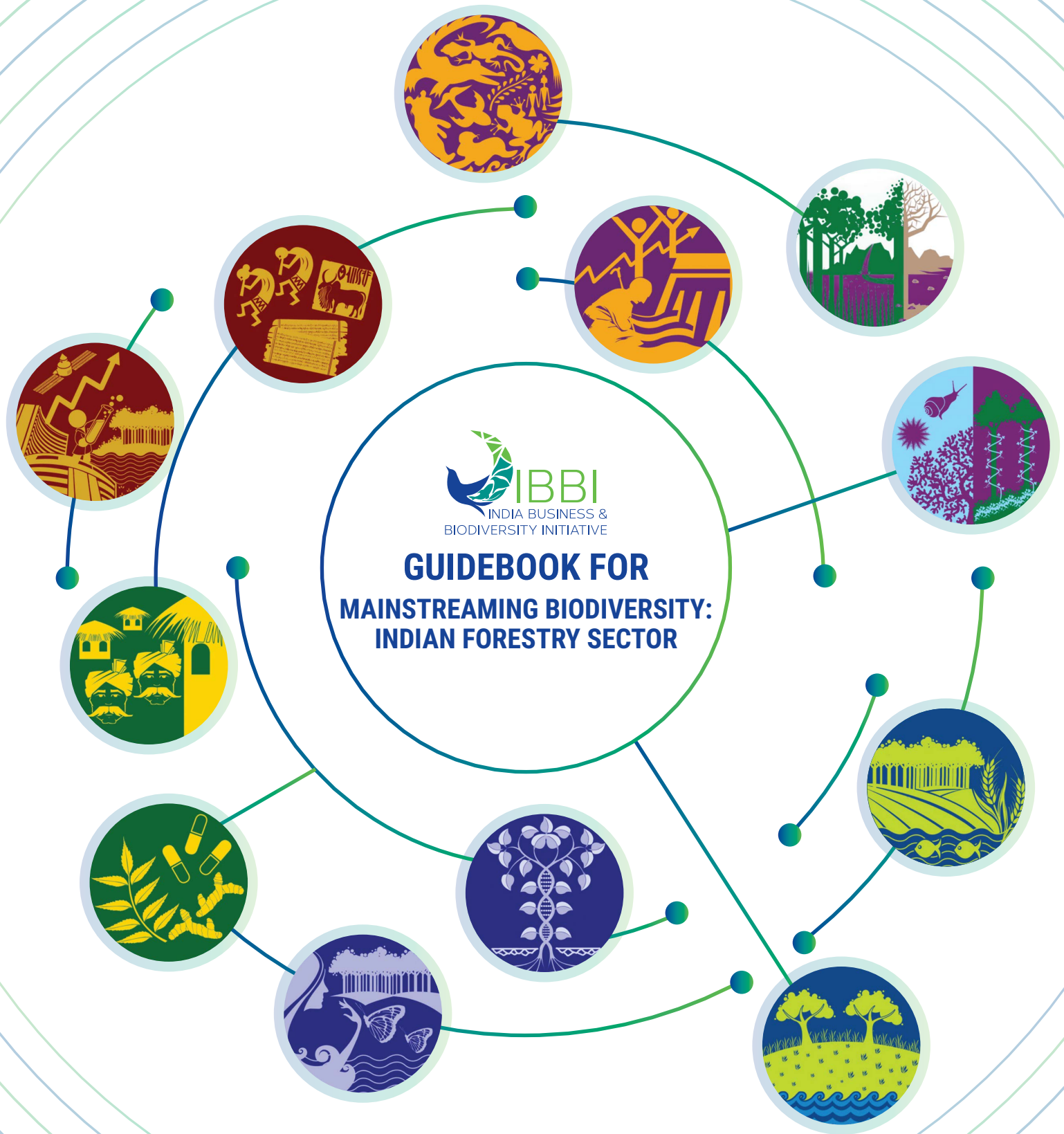




Confederation of Indian Industry



CII-ITC Centre of Excellence  
for Sustainable Development



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Published by Confederation of Indian Industry (CII), The Mantosh Sondhi Centre; 23, Institutional Area, Lodi Road, New Delhi 110003, India, Tel: +91-11-24629994-7, Fax: +91-11-24626149; Email: [info@cii.in](mailto:info@cii.in); Web: [www.cii.in](http://www.cii.in)





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# Biodiversity and Indian Forestry Sector

Globally forests are of ecological, social, cultural and economic importance. Wood and non-wood forest resources and products are fundamental to the livelihoods of a large part of the world's human population.

The forestry sector is defined to include all economic activities that mostly depend on the production of goods and services from forests. This would include commercial activities that are dependent on production of wood fiber industrial round wood, fuel wood and charcoal, sawn wood and wood-based panels. It also includes production and processing of non wood forest products and the subsistence use of forest products.

## Biodiversity and Ecosystem Services

Biodiversity includes plants, animals and other organisms and is defined in the Convention on Biological Diversity (CBD) as “the variability among organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; it includes diversity within species, between species and of ecosystems”<sup>1</sup>.

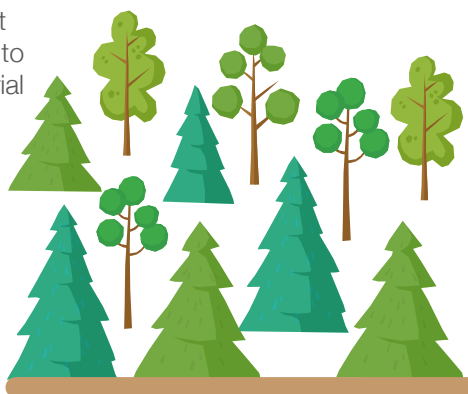
Ecosystem services are defined as “the benefits provided by ecosystems to humans”. Ecosystem services are the goods and services that biodiversity provides. They include soil formation, the provision of food and fiber, air quality and climate regulation, the regulation of water supply and quality and the cultural and aesthetic value of certain plants and species.

Biodiversity includes plants, animals and other organisms and is defined in the Convention on Biological Diversity (CBD) as “the variability among organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; it includes diversity within species, between species and of ecosystems”<sup>2</sup>.

### Box 1: Why Forest Matters<sup>3</sup>

Forests now cover only 6 percent of the planet, but they harbor up to 90 percent of the world's terrestrial biodiversity. This biodiversity is irreplaceable, and also has important economic uses. But forests continue to disappear at an alarming rate.

Forests provide billions of dollars in raw materials for timber, as well as products such as pharmaceuticals, paper, and building supplies.



Forests hold as much as 46 percent of the world's terrestrial carbon stores

More than 1.6 billion people worldwide depend on forests for fuel, medicinal plants, and subsistence income from forest products.

<sup>1</sup><https://www.cbd.int/convention/articles/default.shtml?a=cbd-02>

<sup>2</sup><https://www.cbd.int/convention/articles/default.shtml?a=cbd-02>

<sup>3</sup>Biodiversity and Forests at a Glance, The World Bank



India constitutes 2.3% of the world's total land area and 1.76% of the total forest area of the world. The total forest area of India is 701,673 sq. km, which is 21.34% of its total land area<sup>4</sup>. Forestland in the Indian context is a tract of land that is legally proclaimed to be forest under the forest laws (mainly Indian Forest Acts 1865, 1927). Forestry as a land use category is the second largest land use category after agriculture in India.

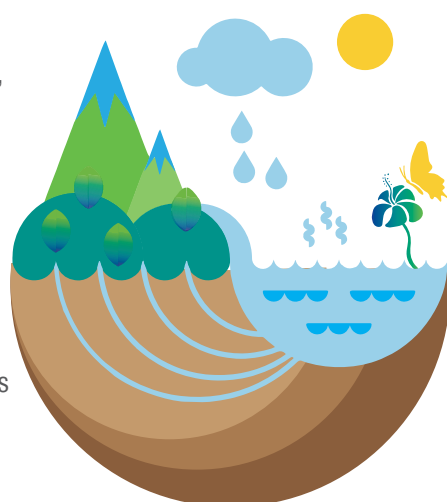
Ecosystem services are defined as “the benefits provided by ecosystems to humans”. Ecosystem services from the forest are broadly categorized into four major areas, Provisional, Regulating, Cultural and Supporting.

## REGULATING

Air quality, climate, water runoff, erosion, natural hazards, pollination

## PROVISIONING

Food, fiber, biomass fuel  
freshwater and natural medicines



## SUPPORTING

Nutrient cycling, water cycling, soil formation, photosynthesis

## CULTURAL

Ethical values, existence values  
recreation and ecotourism

## Important Forest Facts of India

India is one of the **12** mega biodiversity countries supporting **16** major forest types varying from alpine pastures in Himalayas to temperate, sub-tropical, tropical forests and mangroves in coastal areas.

There is an increase of **8,021** sq km (about **80.20** million hectare) in the total forest and tree cover of the country. The observed increase in forest cover is **6,778** sq km and that of tree cover is **1,243** sq km, together covering up to **24.3%** of geographical area of the country.

In India **4.5%** of total land area is reserved as a protected area for maintaining biodiversity. The protected area network is very essential for a country like India and has an intrinsic link with human welfare.

As per the ISFR 2017, the total mangrove cover stands at **4,921** sq km and has shown an increase of **181** sq km.

The total carbon stock in the country's forest is estimated to be **7,082** million tonnes with an increase of **38** million tonnes over the last assessment in 2015 by FSI

The bamboo-bearing area in the country has been estimated at **15.69** million ha

Forests play a vital role in water conservation and improve the water regime. there is an increase of **2,647** sq km in the extent of water bodies inside forest cover between 2005 to 2015.

<sup>4</sup>Forest Survey of India, India State of Forest Report, 2015

## Forestry Sector in India

In India the forestry sector saw a huge growth and rapid development after independence in 1947. During this period large number of paper and pulp mills, saw mills and plywood industries were established and there was a quantum jump in demand of forest products due to the growing needs of rural and urban households.

At present India produces a range of processed forest (wood and non-wood) products ranging from sandal wood, panel products and wood pulp to bamboo, rattan ware and pine resin. The paper industry produces over 3 million tonnes annually from more than 400 mills (however, raw material to produce that volume comes substantially from non-wood fiber).

Total industrial wood consumption by wood-based processing industries is about 30 million cubic meters. This, however, accounts only for about 10 percent of total wood consumption; 90 percent is consumed in the form of small timber and fuelwood.

Apart from timber, these forests provide various Non-wood Forest Products (NWFPs) like gums, resins, flosses and fibers, medicinal plants, flowers, fruits etc. NWFPs contribute to nearly 50 per cent of the average annual income of about 30 percent of the rural population in the country.

Forestry sector contributes **2%** to India's GDP, however the sector has seen a decline from **1.0%** to **0.8%** GDP over the period of nine years i.e. from 1999 to 2006. Though the GDP declined, the value of its output had an increase of **162%** from **19,907** crores in 1999-2000 to **32,299** crores in 2007-2008.



## Drivers of Biodiversity Loss Due to Forestry Sector

### FOREST DEGRADATION

Deforestation due to logging and unsustainable cutting, land clearing for industrial owned plantation & agriculture

### CLIMATE CHANGE

Carbon stocks are reduced on an average to 76% of primary forest levels in selectively logged tropical forests.

### INVASIVE SPECIES

The composition of species changes as disturbance-tolerant species invade and interior specialist species decline and there is increased water run-off and severe soil erosion, particularly along skid trails and roads.

### LAND USE CHANGE

Monoculture plantation on forest land

# Biodiversity Linkages with Forestry Sector

The forestry sector in India covers industries like Wood & Furniture, Pulp & Paper, Non-wood Forest Produce (NWFPs), Fuelwood, etc. The major source of raw material is forest, farm forestry and social forestry.

Each industry in forestry sector has its own implications with respect to its dependency and impact on biodiversity.



## Pulp & Paper Industry

In India, of the total paper production, 40% is from hardwood and bamboo fiber, 30% is from agro waste and the other 30% from recycled material. Paper used for publications and newsprint accounts for 2 million tonnes. 1.2 million tonnes of newsprint are manufactured and the remaining is imported from other producers.

The pulp and paper industry is a chemical process industry with major impact on the environment. The potential pollutants from a pulp and paper mill can be classified into four categories: (1) liquid effluents, (2) air pollutants, (3) solid wastes and (4) noise pollution



## Rubber Industry

India has an abundant supply of rubber wood and natural rubber plantations cover 520, 000 hectares, with an additional 6,000 hectares being replanted every year. The southern state of Kerala produces 95% of the total supply of rubber wood in India<sup>5</sup>. Rubber plantation extensively effects ground water resources and require heavy use of fertilizers. Apart from this, rubber plantations industry majorly causes land use change, habitat destruction and species depletion. The industry expects a growth in the output with the gap in supply and demand which requires Indian tyre companies to import.

<sup>5</sup>Indian wood sector market study 2016

<sup>6</sup>Indian wood sector market study 2016



## NWFPs

NWFP may be gathered from the wild, or produced in forest plantations, agroforestry schemes and from trees outside forests. NWFP include products used as food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes.

In India NWFPs are derived from over 3,000 species which include honey, gum, rattan, bamboo, cork, nuts, mushrooms, resins, essential oils and plants for pharmaceutical & medicinal products. NWFPs have also attracted considerable global interest in recent years due to the increasing recognition of their contribution to environmental objectives, including the conservation of biological diversity.



## Other Industries

India possess around 100,000 registered woodworking units and more than 200,000 artisans, along with countless other related units<sup>6</sup>.

Other than this the Indian forest industry caters to a variety of industries and helps in production of an array of products:

- ▶ Tree barks used to generate electricity for lumber and paper industries.
- ▶ By products of pulp production used in paints, chewing gums, detergents, and asphalt.
- ▶ Wood pulp used to create deodorants, hair sprays, cleaning compounds, cosmetics, and medicines.
- ▶ Cellulose from trees is useful for producing crockery, helmets, toothbrushes, and electrical outlets.





## National Biodiversity Targets (NBTs) and Forestry Sector

UN Convention on Biological Diversity (CBD) mandates each Party to prepare a National Biodiversity Strategy and Action Plan (NBSAP) or an equivalent instrument, and to ensure that the strategy is mainstreamed into relevant sectoral or cross sectoral plans, programmes and policies.

CBD developed the Strategic Plan for Biodiversity 2011-2020 – A ten-year framework for action by all countries and stakeholders to save biodiversity and enhance its benefits for people. The Strategic Plan is comprised of a shared vision, a mission, strategic goals and 20 ambitious yet achievable targets, collectively known as the Aichi Targets.

### Box 1: Mainstreaming Biodiversity into Agriculture, Fishery and Forestry

The Secretariat of the Convention on Biological Diversity participated in 23rd session of the Committee on Forestry. During its session the Committee focused on the interlinkages between forest and other sectors and issues, including biodiversity and climate change. Decisions were made to work on the 2030 Agenda for Sustainable Development and the role of forests, to support countries in promoting the multi-functional role of forests through valuation of ecosystem services and increased private sector involvement in sustainable forest management.

► CBD's Subsidiary Body on Scientific, Technical and Technological Advice- UNEP/CBD/COP/13/10<sup>7</sup>

For reducing and preventing deforestation an important mitigation option, an intensive mechanism was initiated for “reducing emissions from deforestation and forest degradation; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries” (REDD+)<sup>8</sup>.

India using the Aichi targets framework and developed 12 National Biodiversity Targets (NBTs) along with indicators for monitoring and brought out a National Biodiversity Action Plan Addendum 2014<sup>9</sup>.

<sup>7</sup>CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY Thirteenth meeting Cancun, Mexico, 4-17 December 2016  
<https://www.cbd.int/doc/meetings/cop/cop-13/official/cop-13-10-en.pdf>

<sup>8</sup>REDD+ and Biodiversity Benefits: <https://www.cbd.int/forest/redd-plus/default.shtml>

<sup>9</sup>CBD-THIRD MEETING OF THE SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE:  
<https://www.cbd.int/doc/meetings/cop/cop-04/official/cop-04-02-en.pdf>

NBTs		Action for mainstreaming of NBTs in Forestry sector
<b>1</b> Biodiversity Awareness 	By 2020, a significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	Awareness and Capacity building programs through engagement with civil society organisations/NGOs, Panchayati raj institutions and Community Forest Rights (CFR) committees for local communities and tribal populations
<b>2</b> Biodiversity Valuation & Poverty Alleviation 	By 2020, values of biodiversity are integrated in national and state planning processes, development programmes and poverty alleviation strategies.	Including biodiversity and ecosystem services in decision making, planning and reporting. Undertaking valuation and impact assessment studies.
<b>3</b> Safeguarding Natural Habitats 	Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being.	Adopting to measures and strategic plans for protecting and safeguarding biological/natural resources. Management plans for maintain ecosystem services, natural regeneration and rehabilitation.
<b>4</b> Managing Invasive Species 	By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed	Develop management systems that favor natural processes and preferably plant native species that enhance the productivity and resilience of the forest.
<b>5</b> Sustainable Landscapes 	By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.	Implementing sustainable practices and sustainable management.
<b>6</b> Protected Areas 	Ecologically representative areas under terrestrial and inland water, and also coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area-based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20% of the geographic area of the country, by 2020.	Management or maintenance of forest biodiversity, identification and measures for protection. Avoidance of activities in protected area.



NBTs		Action for mainstreaming of NBTs in Forestry sector
	<p>By 2020, genetic diversity of cultivated plants, farm livestock, and their wild relatives, including other socioeconomically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.</p>	<p>Facilitate ecological research and monitoring systems to provide useful guidance on forest dynamics, regeneration and genetic diversity. Monitoring and maintaining indigenous varieties (in situ).</p>
	<p>By 2020, ecosystem services, especially those relating to water, human health, livelihoods and well-being, are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.</p>	<p>Establishment of representative natural forest within the plantation estate. Collaborative activities with forest owners, users and managers across the landscape to best ensure the maintenance of sufficient high quality connected habitat for species.</p>
	<p>By 2015, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization as per the Nagoya Protocol are operational, consistent with national legislations.</p>	<p>Adapting to indigenous and local forest management systems, implementation of traditional practices and maintaining prior and informed consent concerning use of land and resources will ensure biodiversity conservation and local economic benefits.</p>
	<p>By 2020, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity 2011-2020 and the national targets are identified and the Strategy for Resource Mobilization is adopted.</p>	<p>Capacity building, education and awareness-raising on indigenous issues and rights is required. Adapting to traditional practices and local community engagement.</p>

Forests are critical to global sustainable development. Forestry sector provides an array of benefits socially, economically and environmentally if sustainable forest management is incorporated. The benefits provided are:

- ▶ Livelihood enhancement, income generation and employment opportunities.
- ▶ Community development, especially improve the life of indigenous population & forest dwellers.
- ▶ Forests provide for mitigation of climate change, food security & healthy environment.

# Integration of Biodiversity in Forestry Sector

## Wood & Furniture Industry

The immediate threat to forest biodiversity is deforestation and degradation. Biodiversity conservation can be achieved by:



### Box 2: FSC Certification to Uttar Pradesh Forest Corporation (UPFC)<sup>10</sup>

UPFC has been certified as been awarded the Forest Stewardship Council (FSC) Forest Management (FM) certification for “Well Managed Forest” to showcase their dedication towards being an environmentally and socially responsible organisation.

Sourcing FSC certified wood enables companies to help conserve and protect forests, wildlife and people. Through this certification the rights of local people would be assimilated and their role, contribution into securing and conserving forests. UPFC FSC certified forest products are acceptable at the international markets.

### Box 3: Godrej Interio (GI)<sup>11</sup>

GI uses boards made of wood chips sourced from rapidly renewable tree species like Rubber wood, Eucalyptus & Poplar. The chips are sourced from Forest Stewardship Council (FSC) certified forests. Rapidly renewable trees are tree species which grow to full maturity within a life span of 8 to 10 years. Use of these species prevents deforestation of conserved forests.

### ITC<sup>12</sup>

Follows Forest Stewardship Council (FSC) and forest management safeguarding ecosystem services and securing raw materials. The certification ensures credible sourcing of wood, wood pulp and use of recycle grade paperboards and paper.

### Meeting NBTs



<sup>10</sup>[http://www.lesprom.com/en/news/Uttar\\_Pradesh\\_Forest\\_Corporation\\_in\\_India\\_earns\\_FSC\\_certification\\_67076/](http://www.lesprom.com/en/news/Uttar_Pradesh_Forest_Corporation_in_India_earns_FSC_certification_67076/)

<sup>11</sup>[http://www.godrejinterio.com/Godrejinterio/pdf/Interio\\_Sustainability\\_Report.pdf](http://www.godrejinterio.com/Godrejinterio/pdf/Interio_Sustainability_Report.pdf)

<sup>12</sup>ITC Sustainability Report 2018: <https://www.itcportal.com/sustainability/sustainability-report-2018/sustainability-report-2018.pdf>



## Pulp & Paper Industry

The pulp & paper poses a threat to biodiversity loss which is reflected by forest degradation, plantation impact on soil, eutrophication of water due to pulping and many more. The distribution of indigenous species change gives way to proliferation of invasive species and the seasonal patterns in ecosystem processes get altered.

Following are ways to mainstream biodiversity in the sector :



### Box 4: International Paper APPM (IPAPPM) Ltd.<sup>13</sup>

Promotes farm forestry facilitating deforestation of barren and non-fertile land along with benefits to small and marginal farmers. IPAPPM developed an innovative method of tree cloning with zero requirement of energy or power supply and low cost of establishment. This enables sustainable species conservation.

### Meeting NBTs



<sup>13</sup>International Paper APPM: <http://www.ipappm.com/sustainability.html>



## Rubber Industry

Sustainable forestry means that the benefits of healthy and productive forests are continuously provided. This can be assured by sound forest management plans, actions, assessing and integrating a wide array of conflicting factors- commercial and non-commercial values, environmental considerations, community needs and perhaps even global impact:

Activities that will contribute towards achieving the Nationally Determined Contribution Targets (NDC's) that are related to forestry.

Developing strategy for including valuation of ecosystem services and climate change concerns adequately into the planning and management of forests, protected areas and ecosystem services.

Integrate climate change mitigation and adaptation measures like REED+ for minimizing the impacts.

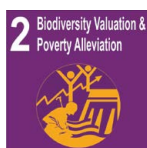
### Box 5: Apollo Tyres India<sup>14</sup>

With the need to develop environmentally friendly raw materials and reduce their sourcing of raw materials from forests Apollo Tyres collaborated with Rubber Research Institute of India and invented special grade of Epoxide Natural Rubber (ENR), a rubber compound for tyres, which was patented by Government of India. This enabled the company with a sustainable solution and increase in product performance. Use of ENR reduces deforestation, pollution and energy consumption.

### Use of End-of-Life Tyres<sup>15</sup>

Apollo tyres has developed a mechanism for tackling the issue of end-of-life tyres with a mechanism of reuse. Under the company's umbrella initiative, created playgrounds by creating play structures like monkey-climb, swing and ropeway using worn-out tyres.

### Meeting NBTs



<sup>14</sup><https://www.financialexpress.com/auto/car-news/exposide-natural-rubber-enr-a-sustainable-solution-for-high-performance-tyres-apollo-tyres/928778/>

<sup>15</sup><https://corporate.apollotyres.com/press-media/news/apollo-tyres-uses-end-of-life-tyres-to-create-go-the-distance-playgrounds-for-village-children/?subsecti=Announcements>



## NWFPs

Biodiversity loss, degradation, changes in land use and loss of the forest resources would subsequently influence other sectors like agriculture and tourism which are dependent on forest ecosystem and ecosystem services.

- ▶ Favour environmentally responsible and eco-friendly products for building material, capital goods, food and consumables.
- ▶ Reduce energy consumption and adopt to use of renewable energy.
- ▶ Practice rainwater harvesting and reduce water consumption from the source.
- ▶ Active measures to control green-house gas emission and offset climate change.
- ▶ Implement practices to reduce pollution from noise, light, runoff, erosion, ozone-depleting compounds and air and soil contaminants.
- ▶ Use endemic native species for landscaping and restoration and take measures to avoid the introduction of invasive alien species.

### Box 6: BioCare<sup>16</sup>

Honey, mostly collected from wild habitat is the critical ingredient in various products of BioCare. BioCare collaborated with Center of Science for Villages (CSV), Wardha, Maharashtra to train honey hunters in sustainable honey collection processes and licenses were provided to them for honey hunting. Thus, promoting sustainable sourcing of honey.

### Mahindra & Mahindra<sup>17</sup>

Mahindra & Mahindra in collaboration with Nandi Foundation designed a “functional forest” for Araku Valley, Andhra Pradesh that would grow faster and be beneficial to the local community. They used Coffee plants and planted varieties of trees as shade and boundary for coffee shrubs creating a symbiotic system. Through the Hariyali initiative more than 7.5 million trees were planted in the Araku Valley. The project has reached out to 100,000 people across 350 villages. Nearly 15,000 acres have been revitalized and 14,750 farmers have benefited.

### Meeting NBTs



<sup>16</sup><https://www.businessbiodiversity.in/wp-content/uploads/2016/12/CESD-IBBI-REPORT-FOR-WEB.pdf>

<sup>17</sup><https://www.livemint.com/Leisure/Kxi9viEcMwhaX3DPEsUrrL/How-green-is-my-Araku-Valley.html>



**CII-ITC Centre of Excellence  
for Sustainable Development**

CII-ITC Centre of Excellence for Sustainable Development is a not-for-profit, industry-led institution that helps business become sustainable organisations. It is on a mission to catalyse innovative ideas and solutions, in India, and globally, to enable business, and its stakeholders, in sustainable value creation. It's knowledge, action and recognition activities enable companies to be future ready, improve footprints profiles, and advocate policymakers and legislators to improve standards of sustainable business through domestic and global policy interventions.

CESD leverages its role of all-inclusive ecosystem player, partnering industry, government, and civil society. It has been a pioneer of environment management systems, biodiversity mapping, sustainability reporting, integrated reporting, and social & natural capital valuation in India, thus upgrading business in India to sustainable competitiveness.

With three locations in India, CESD operates across the country and has also been active in parts of South and South East Asia, Middle East, and Africa. It has held institutional partnerships and memberships of the United Nations Global Compact, Global Reporting Initiative, International Integrated Reporting Council, Carbon Disclosure Project, development agencies of Canada, the USA, the UK, and Germany.

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