

Key Terms From: India State of Forest Report 2023

Glossary

A

Above-ground biomass (vegetation): All biomass of living vegetation, both woody and herbaceous, above the soil, including stems, stumps, branches, bark, seeds, and foliage. (*Source - 2006 IPCC Guidelines for National Greenhouse Gas inventories*)

Aerial photographs: A photograph taken from an air-borne platform using a precision camera.

Afforestation: Establishment of forest through planting and/or deliberate seeding on land that, until then, was under a different land use, implies a transformation of land use from non-forest to forest.

Agroforestry: A land use system which integrates trees and shrubs on farm lands and rural landscapes to enhance productivity, profitability, diversity, and ecosystem sustainability. (*Source - National Agroforestry Policy, 2014*)

Anthropogenic: Resulting from or produced by human activities.

B

Bamboo density: Pure: 151 and more clump/ha for clump forming bamboo or 9001 and more culms / ha for non-clump forming.

Dense: 51 to 150 clump/ha for clump forming or 3001 to 9000 culms / ha for non-clump forming.

Scattered: 1 to 50 clump/ha for clump forming or 1 to 3000 culms/ha for non-clump forming.

Below-ground biomass (vegetation): All biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter. (*Source - 2006 IPCC Guidelines for National Greenhouse Gas inventories*)

Biodiversity: Biodiversity, or, "Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (*Source - Convention on Biological Diversity*)

Biomass: Biomass is the organic material that comes from plants or animals. Biomass can be above- ground, or below-ground, as defined above.

Biomass equations: Biomass equations are the regression equations which are mathematical functions that relate biomass per tree as a function of a single or a combination of tree dimensions such as dbh, tree height, etc.

Biotic influences: Any influence of living organisms. Usually restricted to the influence of animals including man. Usually in forests, the biotic influences could include grazing, browsing, man-made fire, pollarding, illicit felling, and lopping.

Block (of trees): Patch of trees outside RFA, of size 0.1 ha or more

C

Canopy: The cover of branches and foliage formed by the crown of trees.

Canopy density: Percent area of land covered by canopy of trees. It is expressed as a decimal coefficient, taking closed canopy as unity.

Carbon dioxide (CO₂) equivalent (eq.): It is a metric measure used to compare the emissions from various greenhouse gases based on their global-warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

Carbon pools: Carbon pools are major components of an ecosystem that can either accumulate or release carbon.

Carbon sequestration: It is a natural or artificial process by which carbon dioxide is removed from the atmosphere and held in solid or liquid form.

Carbon stock: Carbon in all living and non-living biomass including Above Ground Biomass, Below Ground Biomass, Deadwood, Litter, and Soil carbon

Change matrix: It presents change in land use/forest cover classes for a given area during the period of two consecutive assessments in a tabular form by showing the changes of area from one class to another.

Climate change: Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. (Source - UNFCCC)

Coral reefs: Corals are colonial marine invertebrates. A coral reef is an underwater ecosystem characterised by structure-building stony corals.

Correlation: The correlation between two variables is the degree of association between two variables. This degree of association is expressed

by a single value called a correlation coefficient (r), which can take values ranging between -1 and +1.

Crop composition: It refers to the type of species or group of species, which are contained in a forest. According to crop composition, forest can be either pure or mixed.

Culturable Non Forest Area: It is the net geographical area, lying outside recorded forest, which can support tree vegetation (thus, excluding areas under waterbodies, riverbeds, perennial snow covered mountains, Alpine pastures, Sand dunes etc.). CNFA is the area over which the sample data on TOF is aggregated for the assessment.

D

Dead wood: All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 5 cm in diameter. (Source - 2006 IPCC Guidelines for National Greenhouse Gas inventories)

Decomposition: It is the process by which dead organic materials are broken down into simpler organic or inorganic substances such as carbon dioxide, water, simple sugars, and minerals.

Deforestation: The conversion of forest to other land use independently whether human-induced or not. It includes areas of forest converted to agriculture, pasture, water reservoirs, mining, and urban areas. (Source - GFRA, 2020)

Desertification: Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and

human activities. (Source - [https://catalogue.unccd.int/1195 Desertification.pdf](https://catalogue.unccd.int/1195%20Desertification.pdf), 26.07.2024)

E

Ecological restoration: Ecological (Ecosystem) restoration means assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact. (Source - www.decadeonrestoration.org - *What is Ecosystem Restoration? | UN Decade on Restoration*, 26.07.2024)

Edaphic factors: A condition of the soil, whether physical, biological or chemical, that influences the organisms and processes that occur in the soil.

Emission: The release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time. (UNFCCC Article 1.4) (Source - *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories - Glossary*)

Emission factor: A coefficient that quantifies the emissions or removals of a gas per unit activity. Emission factors are often based on a sample of measurement data, averaged to develop a representative rate of emission for a given activity level under a given set of operating conditions. (Source - *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories - Glossary*)

Exotic species: Exotic species are organisms that have been introduced into an area outside their normal distribution.

F

Forest area: The area recorded as a forest in the Government records. It is also referred to as "Recorded Forest Area".

Forest Cover: All lands, more than or equal to one hectare in area, with a tree canopy of more than or equal to 10%, irrespective of ownership and legal status; and includes orchards, bamboo, and palm

Forest ecosystem: A forest ecosystem is a dynamic complex of plant, animal and micro-organism communities and their abiotic environment interacting as a functional unit, where trees are a key component of the system. Humans, with their cultural, economic and environmental needs, are an integral part of many forest ecosystems.

Forest health: From the Utilitarian standpoint, forest health is defined as the production of forest conditions which directly satisfy human needs. From an Ecosystem standpoint, it is defined by resilience, recurrence, perseverance, and biophysical processes which lead to sustainable ecological conditions (Kolb et al., 1994) (*detailed citation may be seen under chapter 8*)

Forest Inventory: Forest inventory is the systematic collection of data on the forestry resources within a given area. It allows assessment of the current status and lays the ground for analysis and planning, constituting the basis for sustainable forest management. (*Source - fao.org/sustainable-forest-management/toolbox/modules/forest-inventory/basic-knowledge/en/?type=111, 26.07.2024*)

Forest management: A system of practices for stewardship and use of forestland aimed at fulfilling relevant ecological (including biological diversity), economic and social functions of the forest in a sustainable manner.

Forest phenology: The science that deals with the time of appearance of characteristic periodic events, such as leaf shedding, etc., in the life cycle of organisms in nature; especially as those events are influenced by environmental factors. (*Source - Glossary of Technical Terms, FRI&C, Dehradun, 1983*)

Forest productivity: Forest productivity refers to the total biomass of the given forest area at a specific time, per unit area.

Forest resources: Forest resources encompass all the assets and elements derived from forests, including timber, non-timber products, biodiversity, clean water, recreational opportunities, and ecosystem services.

Forest stand: Forest stand is an aggregation of tree or other growth, possessing sufficient uniformity in composition, constitution, age arrangement or structure and to be distinguished from adjacent crops forming a silvicultural unit.

G

Geographic Information System: A computer based system for capturing, storing, manipulating, analysing and displaying data, which are spatially referenced to the earth.

Geospatial technologies: Geospatial technology is an emerging technique to study real earth geographic information using Geographical Information System (GIS), Remote Sensing (RS) and other ground information from various devices and instruments.

Girdling: The complete removal of a strip of bark (consisting of cork cambium or "phellogen", phloem, cambium and sometimes going into the

xylem) from around the entire circumference of either a branch or trunk of a woody plant.

Global Forest Resource Assessment: It is led by the Forestry Department of FAO of UN, for an assessment of status and trends of the global forest resources. It contains information on various thematic elements of sustainable forest management and conservation.

Green wash area: The extent of wooded areas generally shown in light green colour on the Survey of India topographic sheets.

Greenhouse effect: The greenhouse effect is the process through which heat is trapped near Earth's surface by substances known as 'greenhouse gases.' (Source - <https://science.nasa.gov/climate-change/faq-What-is-the-greenhouse-effect/> - NASA Science, 26.07.2024)

Greenhouse gas: Gases that have the property of absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface, thus contributing to the greenhouse effect. Greenhouse gases consist of carbon dioxide, methane, ozone, nitrous oxide, chlorofluorocarbons, and water vapour. Water vapour, which reacts to temperature changes, is referred to as a 'feedback', because it amplifies the effect of forces that initially caused the warming. (Source - <https://science.nasa.gov/climate-change/faq-What-is-the-greenhouse-effect/> - NASA Science, 26.07.2024)

Growing stock: The sum (by number or volume) of all the trees growing/living in the forest or a specified part of it.

H

Habitat: A physical portion of the environment that is inhabited by an organism or population of organisms. A habitat is characterized by a relative uniformity of the physical environment and fairly close interaction of all the biological species involved.

Herbs: Herb is a plant with no persistent stem (non-woody) above ground and usually not exceeding 1 meter in height.

Humus: The decomposed organic matter which remains associated with soil minerals is usually referred to as humus.

I

Illicit felling: Any felling of trees done in a state forest, without permission granted by authorized bodies.

Indicator species: An indicator species is a species or group of species chosen as an indicator of, or proxy for, the state of an ecosystem or of a certain process within that ecosystem.

Infiltration: Infiltration refers to the entry of water into the soil.

Invasive species: Species that are non-native to a particular eco-system and whose introduction and spread causes, or is likely to cause socio-cultural, economic or environmental harm (including forest ecosystem) or harm to human health.

L

Land Use, Land-Use Change and Forestry (LULUCF): Land use, land-use change, and forestry (LULUCF), also referred to as Forestry and other land

use (FOLU) or Agriculture, Forestry and Other Land Use (AFOLU), is defined as a greenhouse gas inventory sector that covers emissions and removals of greenhouse gases resulting from direct human-induced land use such as settlements and commercial uses, land-use change, and forestry activities. (Source: *Glossary of Climate Change Acronyms and Terms*, UNFCCC, 2006)

Landscape: An area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values

Large forest fire alert: Alert generated when fire is detected in 3 Contiguous Pixels Connected in the Side or Corner, in any geometry

Linear (patch of trees): Trees on a strip along the road, railway, and canal side having width between 10m to 20m (by and large) and length more than 150m

Litter: Woody material of trees having diameter <5cm and >2mm, which is not decomposed.

Lopping: The repeated removal of side branches on a short cycle, leaving just a tuft at the top of the tree.

M

Mangroves: Salt tolerant evergreen forest ecosystem found mainly in tropical and subtropical coastal and/or inter-tidal regions.

Microclimate: Local climate at or near the Earth's surface.

Minimum Mappable Unit (MMU): The MMU is the size of the smallest feature of a class that can be reliably mapped (2mm x 2mm) which corresponds to 1 ha on 1:50,000 scale for LISS III.

Moderately Dense Forest: All lands with forest cover having a canopy density between > 40, and less than 70 percent.

N

NATCOM: National Communication to UNFCCC

Nationally Determined Contribution: NDC articulates commitments by each country to reduce its national emissions and adapt to the impacts of climate change. Countries across the globe adopted this international climate agreement at the UNFCCC Conference of the Parties (COP21) in Paris in December 2015.

Natural forest: Natural forests are forests composed of indigenous trees, not planted by man. In other words forests excluding plantations.

Natural resources: Assets present in a particular area (below, surface or above) and available for potential use and utilization by its owners. These resources include renewable (reproducible) and non-renewable (non-reproducible, mined) resources, although many resources can be included in both, depending on region or specific conditions.

Niche: Niche is the role or job of a species in a habitat. The word niche comes from the French word *nicher*, which means “to nest.” An ecological niche describes how a species interacts with, and lives in, its habitat.

Nutrient cycling: Biogeochemical cycle, in which inorganic nutrients move through the soil, living organisms, air and water. It refers to the return of nutrients absorbed by plants from the soil, back to the soil.

O

Open Forest: Lands with forest cover having a canopy density between >10 and <40 percent.

P

Physiographic Division: Physiographic divisions separate the Earth into different areas based on the predominant types of landforms found in each region. As example: Mountain, Plain, Plateau, Desert, Islands, etc. are different physiographic divisions.

Plantation: A stand composed primarily of trees established by planting or artificial seeding.

Protected Area: Protected area means a National Park, a Sanctuary, a Conservation Reserve or a Community Reserve notified under sections 18, 35, 36A and 36C of the Wildlife Protection Act.

Protected Forests: An area notified under the provisions of the Indian Forest Act or other State Forest Acts, having limited degree of protection. In protected forest, all activities are permitted unless prohibited.

R

Ramsar Convention: The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world".

Recorded Forest Area: Area recorded as forest in Government records.

Regeneration: The process of replacing old crops with younger generations either naturally or artificially is called regeneration.

Remote Sensing: Remote sensing is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance (typically from satellite or aircraft) (Source - <https://www.usgs.gov/faqs> - What is remote sensing and what is it used for? | U.S. Geological Survey, usgs.gov, 26.07.2024)

Reserved Forest: An area so constituted under the provisions of the Indian Forest Act or other State Forest Acts, having full degree of protection. In Reserved forests all activities are prohibited unless permitted.

Rotation period: The planned number of years between the formation or regeneration of a crop and its final felling. In the case of Selection Forest, the average age at which a tree is considered mature for felling. (Source - *Glossary of Technical Terms, FRI&C, 1983*)

S

Scattered (trees): Trees not included under Block, or Linear patches

Scrub: Forest lands having canopy density less than 10 percent, generally with Shrubs interspersed with trees.

Sedimentation: The entrained soil materials carried in water or air is known as sediment and the process of sediment deposition on the bottom layer is known as sedimentation.

Shrubs: A woody perennial plant differing from a perennial herb in its persistent and woody stem and less definite form a tree in its low structure

and its habit of branching from the base and usually not exceeding 3 meter in height.

Silviculture: Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis. (Source -

https://www.fs.usda.gov/forestmanagement/vegetation-management/Silviculture (usda.gov), 26.07.2024)

Size class: It refers to the average diameter class or girth class of the tree.

Soil erosion: The displacement of the soil by the action of water or wind. Soil erosion is a major process of land degradation.

Soil organic carbon: Carbon contained in soil organic matter.

Soil organic matter: It is the organic component of soil containing small plant residues, small living soil organisms and decomposed organic matter.

Stratification: Stratification is the division of the area into more homogenous units. The purpose of stratification is to increase precision of estimates.

Succession: Sequential change in the relative abundances of the dominant species in a community (dominance based on biomass) over a long period.

Sustainability: A dynamic process that guarantees the persistence of natural and human systems in an equitable manner.

Sustainable Development Goals (SDGs): It is known as global goals, and are adopted as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace as well as prosperity by 2030. All United Nations Member States adopted these goals in 2015.

T

Terrestrial ecosystem: Ecosystem present on the land including forest ecosystem.

Tree: A large woody perennial plant having a single well defined stem (bole or trunk) and more or less definite crown. It also includes bamboos, palms, fruit trees, etc., and excludes non- perennial non-woody species like banana and papaya, and tall shrubs or climbers.

Tree cover: Tree cover comprises all tree patches outside the forest area, which are less than one hectare in extent including all the scattered trees found in the rural and urban settings, and not captured under the forest cover assessment.

Tree Outside Forests (TOF): It refers to all trees growing outside recorded forest areas irrespective of patch size.

V

Very Dense Forest: Lands with forest cover having a canopy density of 70 per cent and above.

Volume equations: Volume equations are the mathematical equations which provide estimates of individual tree volumes based on easily measurable characteristics of trees like tree diameter, height, or others.

W

WFS: The Web Feature Service (WFS) is an interface specified by the Open GIS Consortium (OGC) that allows for the exchange of geographic data across the Web. It defines the rules for requesting and retrieving

geographic information using the Hyper Text Transmission Protocol (HTTP). WFS offers direct fine-grained access to geographic information at the feature and feature property level. Therefore, WFS describes discovery, query, or data transformation operations in the web platform.

WMS: A Web Map Service (WMS) defines an interface that allows a client to get maps of geospatial data and gain detailed information on specific features shown on the map, without the facility of editing. A “map” is defined here as a visual representation of geospatial data, not the geospatial data itself.

Source

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