



Natural Resources

Natural Resources, Renewable and non-renewable resources Natural resources and associated problems.

Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining.



Natural Resources

- Life on earth depends on several things and services provided by nature, which are called Natural resources.
- Resources are items, ingredients, materials or source of energy found in nature that are required for any useful function. Most of the natural resources are of economic interest.
- Some examples of natural resources are water, air, minerals, soil, coal, forests, and wild life etc.



Natural Resources

- The resources which can be regenerated within a short period of time alongwith their utilization (e.g., solar energy, soil, water, forests etc.) are called renewable resources.
- Other examples of renewable resources can be regenerated within a short span of time are wildlife, wind energy, biomass energy, tidal energy, hydro power etc.



Natural Resources

- Solar energy is a renewable form of energy because it is an unlimited source of energy.
- Non-renewable resources are the recourses which cannot be renewed e.g. Fossil fuels like petroleum and coal, minerals and ores. Once the reserves of these resources get exhausted these can-not be regenerated.



Natural Resources

- The renewable resources like forests etc. can be converted to non-renewable if we exploit them so much so that their rate of depletion exceeds their rate of regeneration. Hence, if a plant or animal is utilised so much that its population size reduces to a minimum threshold level then the plant or animal species becomes endangered or extinct.



Natural Resources

- Those resources which cannot be regenerated once utilized on a large scale (e.g., petroleum, coal, ores etc.) are called non-renewable resources. Renewable resources can also become non-renewable if over-utilized in an inappropriate manner. All the things we require to fulfil our daily needs viz. food, clothes, books, toys, vehicles, etc., are all derived from natural resources.



Natural Resources

- The protection and conservation of our natural resources is extremely important for the survival of future generations.
- We should use natural resources in a sensible manner so that these resources don't get exhausted.
- It does not mean that we should stop using the natural resources.
- Rather, we should use the natural resources in such a manner that sufficient resources remain on earth for future generations



Major Natural Resources

- Forest resources
- Water resources
- Mineral resources
- Food resources
- Energy resources
- Land resources

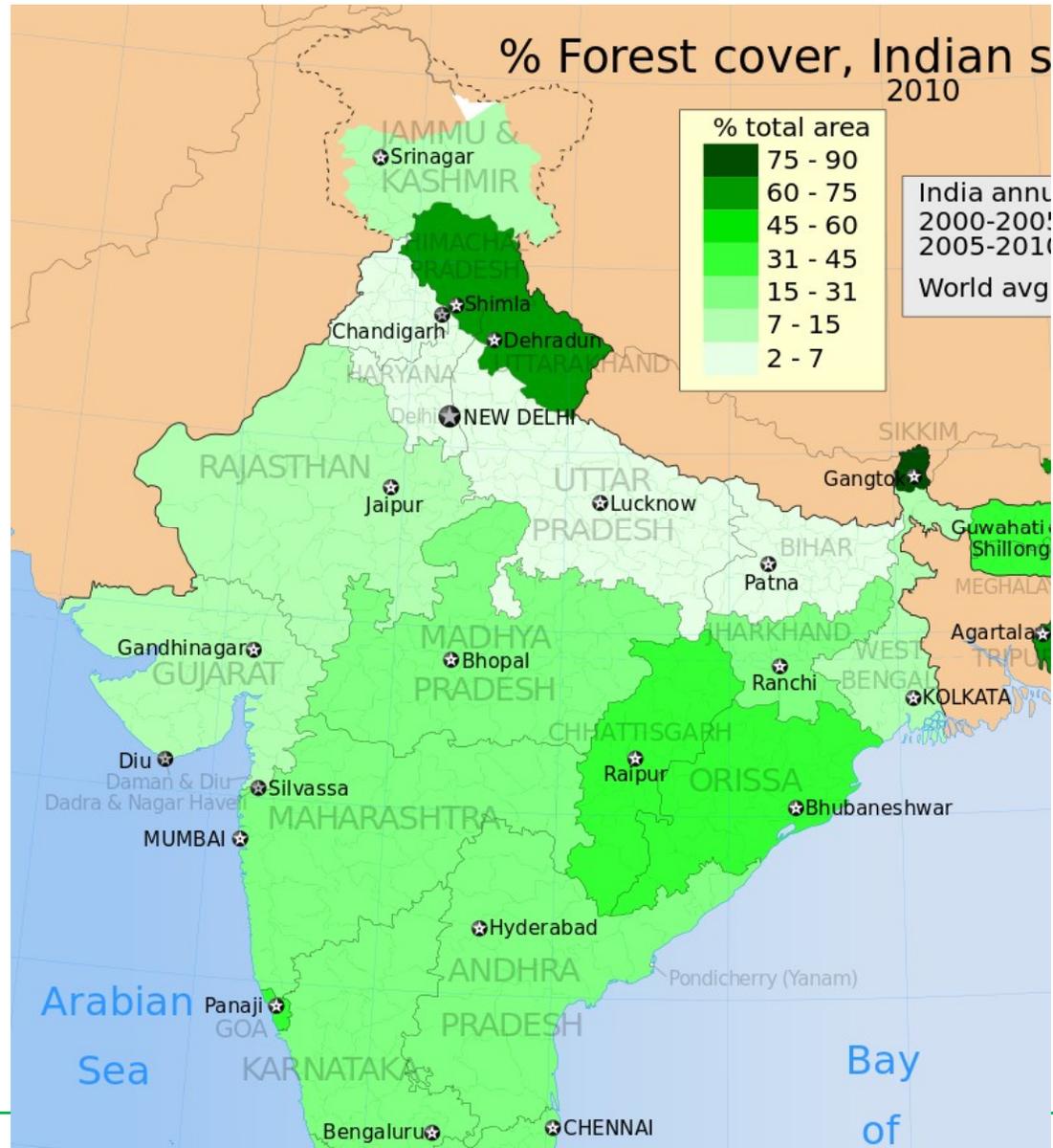


Forest resources

- Ideally India should have 33 percent of its land covered with forests. Currently India has only about 21 percent of land area covered with forests, which is very less compared to the desirable forest cover.
- Therefore besides protecting the available forests, we need to increase our forest cover. The livelihood of so many people, who live in or around forests depend upon forest resources.



Forest cover in India





Forests of Sikkim





Forest River of Cherrapunjee



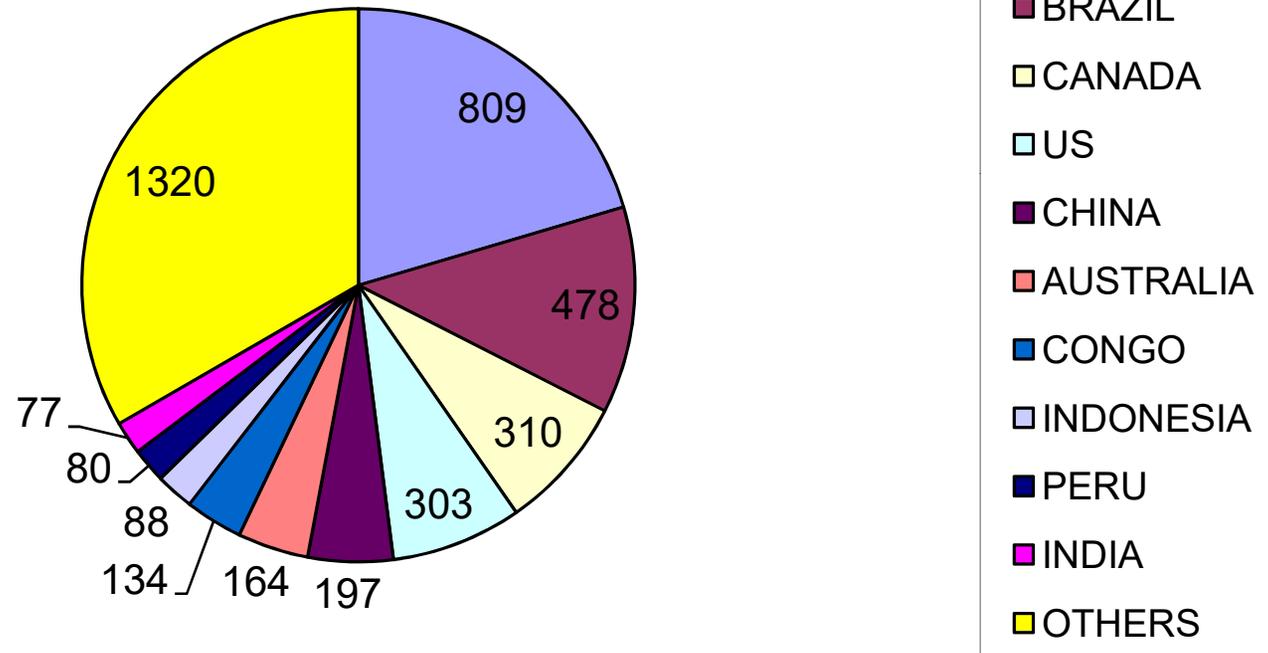


Forest resources

- It is a matter of great concern that the cover of the natural forests has been declining continuously all over the world over the years.
- The maximum forest loss occurred in tropical Asia where about one third of the forest resources have been destroyed.



Ten Countries With The Largest Forest Area (in million hectare)





Forest Cover in India

- India's estimated forest cover is about 690899 sq. Km, or about 21.02 percent of the country's area.
- However the dense forest cover is only about 12%.
- The per capita availability of forest land in India is one of the lowest in the world, 0.08 ha, against the world average of 0.64 ha for the world
- Forests contribute about 1.7 percent to India's GDP.



Types of Forest Resources

- **Old Forests:** These are pristine forests which have remained protected from natural disasters or human activities.
- **Second-Growth Forests:** They are naturally regrown forests when forests get burnt due to severe forest fires / or are cleared and then left undisturbed for long periods of time.
- **Plantations:** These are man-made forests of commercially important trees. These are created usually by clearing natural forests.



Uses of Forests

- Commercial uses: Forests provide us a large number of commercial goods which include timber, firewood, pulpwood, food items, gum, resins, non-edible oils, rubber, fibers, lac, bamboo canes, fodder, medicine, drugs and many more items,
- Almost half of the trees cut each year are used as firewood for cooking and heating. One third of the wood cut is used as lumber at construction sites, as hardwood, and in making plywood, particle board etc. One sixth of the trees cut are consumed by paper industry. Forest lands are continuously degrading due to industrial activities viz. mining, plantation of commercial trees and construction of dams.



Mahogany Tree





Deodar Tree





Pine Tree





Commercial Uses Of Forests

- Forests provide a range of special foods such as uncommon vegetables, roots, tubers, flowers etc.
- Forest supply gum, tendu pattas, mahua flowers, oilseeds too.
- Forests provide herbal and traditional medicines, fragrances, edible gums and resins etc.
- Firewood for cooking and fodder for animals



Commercial Uses Of Forests

- Bidi rolling is an important work which is the primary source of livelihood in some parts of the country.
- India is one of the major producers of animal based resin: lac and its derivatives. India is the major export of Lac and Lac-based products.
- Over 90% of Indian lac comes from the forests of Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Maharashtra and Orissa.



Commercial Uses Of Forests

- Pulp and paper
- Sawmills
- Furniture
- Match box industry
- Cottage industries



Commercial Uses Of Forests

- Forest foods are rich in some proteins, fats, vitamins and minerals that are not found in commercial crops.
- Wild mammals, reptiles, birds and insects which live in forests or trees are important source of food for people living in or around forests.
- About 80 percent of the people living in developing countries depend on forests for their primary health and nutritional needs.
- Forest based herbs and other products are the only source of medicine for about 80 percent of people living in developing countries.



Resin extraction from pine trees



https://upload.wikimedia.org/wikipedia/commons/thumb/2/27/Resin_Extraction_from_Chir_Pine_.jpg/768px-Resin_Extraction_from_Chir_Pine_.jpg



Resin extraction from pine trees





Lac or Shellac on tree branch





Lac or Shellac on tree branch





Timber Extraction

- Logging for valuable timber, such as teak and Mahogany involves the destruction of many other non-timber trees.
- Road construction for transporting the timber causes further damage to the forests.



Logging of Trees





Logging of Trees





Mining

Mining activities for extracting minerals and fossil fuels like coal often involves vast forest areas. Mining from shallow deposits is done by surface mining while that from deep deposits is done by sub-surface mining.

Approximately 80,000 ha of land of the country is currently under mining activities. Mining and its associated activities require removal of vegetation along with underlying soil mantle and overlying rock masses. This results in the destruction of the landscape in the area.



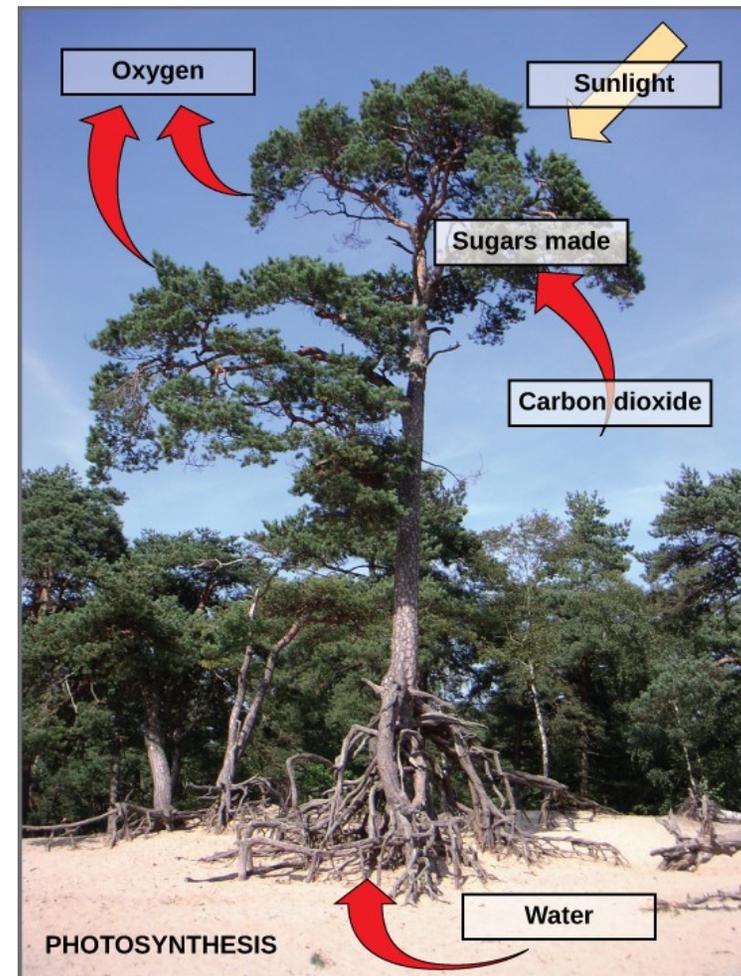
Ecological uses

- Reducing global warming: The main greenhouse gas carbon dioxide (CO₂) is absorbed by the forests as a raw material for photosynthesis. Thus forest canopy acts as a sink for CO₂ thereby reducing the problem of global warming caused by greenhouse gas CO₂



Ecological uses

- Production of oxygen: The trees produce oxygen by photosynthesis which is so vital for life on this earth. They are rightly called as earth's lungs.





Ecological uses

- Wild life habitat: Forests are the homes of millions of wild animals and plants. About 7 million species are found in the tropical forests alone.



Lion





Tiger





Deer





Bear







Ecological uses

- Regulation of hydrological cycle: Forested watersheds act like giant sponges, absorbing the rainfall, slowing down the runoff and slowly releasing the water for recharge of springs.
- About 50-80 % of the moisture in the air above tropical forests comes from their transpiration which helps in bringing rains.



Ecological uses

- **Soil Conservation:** Forests bind the soil particles tightly in their roots and prevent soil erosion. They also act as wind-breaks.
- **Prevention of Soil Erosion** Water moves slowly through forested soils and stays free of sediments.
- **Control of Run-off** Leaves and branches of trees break the impact of rain, causing it to drip rather than have a strong force. Rain is absorbed by the ground, reducing surface run-off.
- **Reduction of Wind Erosion** Trees are used as windbreaks and slow down the force of wind.



Ecological uses

- Pollution moderators: Forests can absorb many toxic gases and can help in keeping the air pure. They have also been reported to absorb noise and thus help in preventing air and noise pollution
- Removal of Pollutants The roots of trees absorb soil and water pollutants.
- Sulphur dioxide is used for metabolism of trees. Thus, forests aid in the cleansing of air, water and soil.



Ecological uses

- Driving energy flow and nutrient cycling



Ecological uses

- Provisions for Healthy Survival of Local Communities and Mankind Forests provide employment and income, aesthetic pleasure and spiritual solace. They also provide food, fibre, honey, medicinal plants and minerals.



Over Exploitation Of Forests

- Since time immemorial, humans have depended heavily on forests for food, medicine, shelter, wood and fuel. With growing civilization the demands for raw material like timber, pulp, minerals, fuel wood etc. shot up resulting in large scale logging, mining, road-building and clearing of forests.



Deforestation

- Deforestation involves the cutting down, burning, and damaging of forests
- Deforestation can be defined as the change of forest with depletion of tree crown cover of more than 90%.
- The total forest area of the world in 1900 was estimated to be 7,000 million hectares which was reduced to 2890 million ha in 1975 and fell down to just 2,300 million ha by 2000.



Major Causes of Deforestation

- Population explosion
- Agriculture: shifting cultivation, overgrazing, cash-crop economy, etc.
- Raw materials for industrial use : cutting trees for sale as timber or pulp
- Fuel requirements
- Poverty
- Mining



Major Causes of Deforestation

- Growing food needs
- Dams
- Infrastructure creation for logging
- Forest fires
- Acid rain
- Development projects and housing projects



Major Causes of Deforestation

- Causes of Deforestation in India
- State-sponsored agricultural expansion
- Rapid industrialisation
- Urbanisation
- Growing consumerism
- Policies and programmes of unsustainable development like subsidies offered
- for making the paper and plywood industry a viable and profitable venture
- Lack of education and awareness programmes regarding (a) real cost of the



Major Causes of Deforestation

- destruction of forests, and (b) legal provisions for the safeguarding of the
- forests
- Absence of strict implementation of laws
- Not including people at all levels in planning, decision making and
- implementation (i.e. absence of social engineering)
- Not taking the correct decisions by decision makers on the basis of accurate



Major Causes of Deforestation

- knowledge and information
- The campaign to safeguard forests is not accompanied with social, economic
- and political reforms
- Corruption of government institutions
- Population growth and overpopulation
- The inequitable distribution of wealth and power



Major Consequences of Deforestation

- It threatens the existence of many wild life species due to destruction of their natural habitat.
- Decreasing levels of rainfall and rainy days
- Increasing rate of soil erosion
- Climate change
- Loss of biodiversity



Major Consequences of Deforestation

- Air pollution
- Decline in watershed functions
- Apparent loss of hardwood, fuel wood, and aesthetic stocks
- Flooding
- Desertification and sedimentation in rivers
- Long-term hydroelectric shortages



People and forests

- Forests are home to 300 million people around the world.
- More than 1.6 billion people depend to varying degrees on forests for their livelihoods, e.g. fuelwood, medicinal plants and forest foods.
- About 60 million indigenous people are almost wholly dependent on forests.
- Some 350 million people who live within or adjacent to dense forests depend on them to a high degree for subsistence and income.



People and forests

- Worldwide approximately 1.2 billion people depend on forest based farming systems.
- Mangrove forests, with worldwide coverage of only about 147 000 km², are of prime importance to the life cycles of the majority of the world's commercial fish species.



People and forests

- About 13 million persons are employed in the formal forestry sector worldwide.
- Gross output of the forestry sector: US\$354 billion
- Global trade in wood products: US\$150 billion.
- Countries having highest contribution from forests to GDP: Bhutan, Finland, Malaysia, Baltic States and some African countries.
- Small-scale forest product enterprises are among the top three non-farm rural commercial activities in most countries.