

Deforestation

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Deforestation is the purposeful clearing of forested land. The land is then converted to non-forest use. It is a serious environmental concern since it can result in the loss of biodiversity, damage to natural habitats, disturbances in the water cycle, and soil erosion. Deforestation is also a contributor to climate change and global warming.

In news: Healthy forests provide a pathway to fight climate change and unlock green recovery

Placing it in syllabus: Environment

Dimensions

- Causes
- Effects
- Deforestation and desertification
- Solutions
- REDD+ and India
- National Forest Policy and National Mission on Green India

Content:

Causes:

Deforestation can be a manifestation of both natural and human induced causes.

- Agricultural expansion continues to be the main driver of deforestation and forest fragmentation
- According to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, the overwhelming direct cause of deforestation is agriculture. Subsistence farming is responsible for 48% of deforestation; commercial agriculture is responsible for

32%

- Large-scale commercial agriculture (primarily cattle ranching and cultivation of soya bean and oil palm) accounted for 40 percent of tropical deforestation between 2000 and 2010, and local subsistence agriculture for another 33 percent.
- The degradation of forest ecosystems has also been traced to economic incentives that make forest conversion appear more profitable than forest conservation
- Other causes of contemporary deforestation may include corruption of government institutions, the inequitable distribution of wealth and power, population growth and overpopulation, and urbanization.
- Globalization is often viewed as another root cause of deforestation.
- Another cause of deforestation is climate change. 23% of tree cover losses result from wildfires and climate change increase their frequency and power. The rising temperatures cause massive wildfires.
- Some commentators have noted a shift in the drivers of deforestation over the past 30 years.
- During the late 19th century, deforestation was primarily driven by subsistence activities and government-sponsored development projects like transmigration in countries like Indonesia and colonization in Latin America, India, Java, and so on. By the 1990s the majority of deforestation was caused by industrial factors, including extractive industries, large-scale cattle ranching, and extensive agriculture

Effects:

Global Warming:

- Deforestation is a contributor to global warming, and is often cited as one of the major causes of the enhanced greenhouse effect.

- Tropical deforestation is responsible for approximately 20% of world greenhouse gas emissions.
- According to the Intergovernmental Panel on Climate Change deforestation, mainly in tropical areas, could account for up to one-third of total anthropogenic carbon dioxide emissions

Imbalances in Water Cycle

- The water cycle is also affected by deforestation.
- Shrinking forest cover lessens the landscape's capacity to intercept, retain and transpire precipitation.
- Instead of trapping precipitation, which then percolates to groundwater systems, deforested areas become sources of surface water runoff, which moves much faster than subsurface flows
- Trees extract groundwater through their roots and release it into the atmosphere.
- When part of a forest is removed, the trees no longer transpire this water, resulting in a much drier climate.
- Deforestation reduces the content of water in the soil and groundwater as well as atmospheric moisture. The dry soil leads to lower water intake for the trees to extract

Disruption in Weather Patterns:

- Deforestation disrupts normal weather patterns creating hotter and drier weather.
- Thus it increases drought, desertification, crop failures, melting of the polar ice caps, coastal flooding and displacement of major vegetation regimes

Soil Erosion and Landslides

- Soils are reinforced by the presence of trees, which secure the soil by binding their roots to soil bedrock.
- Due to deforestation, the removal of trees causes sloped

lands to be more susceptible to landslides.

- Deforestation increases the rate of erosion, because it decreases the amount of litter cover, which provides protection from surface runoff.

Decline in Biodiversity

- Deforestation on a human scale results in decline in biodiversity, and on a natural global scale is known to cause the extinction of many species.
- The removal or destruction of areas of forest cover has resulted in a degraded environment with reduced biodiversity.
- It has been estimated that we are losing 137 plant, animal and insect species every single day due to rainforest deforestation, which equates to 50,000 species a year

Increased Disease Burden:

- According to the World Economic Forum, 31% of emerging diseases are linked to deforestation.
- According to the US Center for Disease Control and Prevention (CDC), 75% of emerging diseases in humans came from animals.
- The rising number of outbreaks is probably linked to habitat and biodiversity loss.
- Since the 1980s, every decade has seen the number of new diseases in humans increase more than threefold.
- According to a major study by American and Australian scientists, degradation of ecosystems increases the risk of new outbreaks. The diseases that passed to humans in this way in the latest decades include HIV, Ebola, Avian flu, Swine Flu, and likely COVID-19.

Economic Impact:

- Damage to forests and other aspects of nature could halve living standards for the world's poor and reduce

global GDP by about 7% by 2050, a report concluded at the Convention on Biological Diversity (CBD) meeting in Bonn in 2008.

- Historically, utilization of forest products, including timber and fuel wood, has played a key role in human societies, comparable to the roles of water and cultivable land.

Deforestation and desertification:

- Desertification is a process by which fertile land is transformed into desert as it becomes progressively drier and unable to support any plant growth for food production.
- Unlike the natural desert ecosystem with well-adapted species still inhabiting the area, desertified lands are often devoid of natural life without a healthy ecosystem in place that would perform life-supporting services, like new soil formation and nutrient cycling.
- Deforestation is one of the leading human causes of desertification.
- Forests are being cut down at a much larger scale than ever before, to be used as fuel, to provide products we use in our daily life, or to simply create more space for agriculture to sustain a growing human population.
- When the trees and other vegetation in an area are gone, there are no roots that would hold soils in place, there is no canopy that would shield the ground from the direct rainfall or from the sun's heat.
- The bare soil then easily dries out and turns to dust, which can be blown and washed away in a single storm.
- Once the soil is degraded and the precious nutrients are lost, only infertile and lifeless swaths of land are left behind.
- Without trees, even the local climate becomes drier due to the lack of water evapotranspiration from tree canopy, which reduces cloud formation in the region and

results in less rain.

Solutions:

Reducing emissions

- International organizations including the United Nations and the World Bank, have begun to develop programs aimed at curbing deforestation.
- The blanket term Reducing Emissions from Deforestation and Forest Degradation (REDD) describes these sorts of programs, which use direct monetary or other incentives to encourage developing countries to limit and/or roll back deforestation.

Payments for conserving forests

- In Bolivia, deforestation in upper river basins has caused environmental problems, including soil erosion and declining water quality.
- An innovative project to try and remedy this situation involves landholders in upstream areas being paid by downstream water users to conserve forests.
- The landholders receive US\$20 to conserve the trees, avoid polluting livestock practices, and enhance the biodiversity and forest carbon on their land.

Land rights to Indegenous Communities

- Indigenous communities have long been the frontline of resistance against deforestation.
- Transferring rights over land from public domain to its indigenous inhabitants is argued to be a cost-effective strategy to conserve forests.
- This includes the protection of such rights entitled in existing laws, such as India's Forest Rights Act

Monitoring deforestation

- Deforestation is typically assessed by quantifying the

amount of area deforested, measured at the present time.

- From an environmental point of view, quantifying the damage and its possible consequences is a more important task, while conservation efforts are more focused on forested land protection and development of land-use alternatives to avoid continued deforestation

Forest management

- Forest management is a branch of forestry concerned with overall administrative, legal, economic, and social aspects, as well as scientific and technical aspects, such as silviculture, protection, and forest regulation.
- This includes management for timber, aesthetics, recreation, urban values, water, wildlife, inland and nearshore fisheries, wood products, plant genetic resources, and other forest resource values

Reforestation

- Reforestation means re-establishing forests that have either been cut down or lost due to natural causes, such as fire, storm, etc. Whereas, the term “afforestation” means establishing new forest on lands that were not forest before (e. g. abandoned agriculture)
- In many parts of the world, especially in East Asian countries, reforestation and afforestation are increasing the area of forested lands.
- The amount of forest has increased in 22 of the world’s 50 most forested nations.

REDD+ and India:

- In simple terms, REDD+ means “Reducing Emissions from Deforestation and forest Degradation”, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing

countries.

- REDD+ is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
- It creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.
- Developing countries would receive results-based payments for results-based actions. REDD+ goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
- Complying with the UNFCCC decisions on REDD+, India has prepared its **National REDD+ Strategy**.
- The Strategy **builds upon existing national circumstances** which have been updated in line with India's **National Action Plan on Climate Change, Green India Mission and India's Nationally Determined Contribution (NDC)** to UNFCCC.
- The strategy seeks to address drivers of deforestation and forest degradation and also develop a roadmap for enhancement of forest carbon stocks and achieving sustainable management of forests through REDD+ actions.
- The Paris agreement on climate change also recognizes the role of forests in climate change mitigation and calls upon country Parties to take action to implement and support REDD+.
- India has communicated in its Nationally Determined Contribution under Paris Agreement, that it will capture 2.5 to 3 billion tonnes of Carbon dioxide through additional forest and tree cover by 2030.
- India's first biennial update report to UNFCCC has revealed that forests in India capture about 12% of India's total GHG emissions.
- Thus, the forestry sector in India is making a positive cost effective contribution for climate change mitigation.

National Forest Policy and National Mission on Green India

National Forest Policy 2018

- The Objective of the policy is to safeguard the ecological and livelihood security of people, of present and future generations, based on sustainable management of the forests for the flow of ecosystem services.

Key Provisions of the National Forest Policy (NFP), 2018 are:

- **Target:** Target of 33% of India's geographical area under forest and tree cover and in the hills and mountainous regions
- **Protection of forest:** Restrict schemes and projects which interfere with forests
- Stabilize ecologically sensitive catchment areas with suitable soil and water conservation measures, and also by planting suitable trees and grass like bamboo.
- **Funds:** Compensatory Afforestation Fund will be a major source of funds for taking up afforestation and rehabilitation works Funds from other national sectors like rural development, tribal affairs, national highways, railways, coal, mines, power, etc., will be taken for appropriate implementation of linking greening with infrastructure and other development activities.
- **Bodies to be established:** Establishment of two national-level bodies, National Community Forest Management (CFM) Mission and National Board of Forestry (NBF)
- **Addressing threats to forests:** Threats to Forests due to encroachments, illegal tree felling, forests fires, invasive weeds, grazing, etc. will be addressed within the framework of the approved Working Plan/Management Plan and also by ensuring community participation in forest management.
- **PPP Model:** Development of Public-private participation models for undertaking afforestation and reforestation activities in degraded forest areas and forest areas

available with forest development corporations and outside forests.

- **Harmonization with other laws:** Achieve harmonization between policies and laws like Forest Rights Act (FRA) 2006.
- **Climate Change:** Calls for integration of climate change mitigation and adaptation measures in forest management through the mechanism of REDD+ (Reducing Emissions from Deforestation and Forest Degradation plus) so that the impacts of the climate change is minimised

National Mission for Green India

- The National Mission for Green India (GIM) is one of the eight Missions outlined under the National Action Plan on Climate Change (NAPCC).
- It aims at protecting; restoring and enhancing India's diminishing forest cover and responding to climate change by a combination of adaptation and mitigation measures.
- It envisages a holistic view of greening and focuses on multiple ecosystem services, especially, biodiversity, water, biomass, preserving mangroves, wetlands, critical habitats etc. along with carbon sequestration as a co-benefit.
- This mission has adopted an integrated cross-sectoral approach as it will be implemented on both public as well as private lands with a key role of the local communities in planning, decision making, implementation and monitoring.
- Green India Mission hinges upon convergence with related Missions of the National Action Plan on Climate Change, other complementary National Mission Programmes and schemes for better coordination in developing forests and their fringe areas in a holistic and sustainable manner.
- The convergence aims at optimizing efficient use of

resources and avoidance of contrast activities which can disturb the balance in the ecosystem due to lack of coordination between different schemes.

Mould your thought: What are the causes and consequences of deforestation? Suggest solutions to overcome these problems.

Approach to the answer:

- Introduction
- Define Deforestation
- Mention the causes of deforestation
- Discuss its effects
- Write about the solutions at the national and International level
- Conclusion