DEFORESTATION-INDUCED WARMING - ENVIRONMENT

Deforestation-linked heat caused nearly 28,000 excess deaths a year in the tropics in 2 decades. A recent study revealed that tropical deforestation is causing thousands of additional heat-related deaths each year due to localized warming. This underscores the urgent need to address deforestation's wide-ranging impacts—from climate change to public health—through robust global and national initiatives.

Deforestation-Induced Warming - A Direct Link to Human Mortality

1. Context - The Deadly Impact of Deforestation

Key Finding - A recent, alarming study published in *Nature Climate Change* has established a direct and quantifiable link between deforestation and human mortality. The research reveals that warming caused specifically by deforestation led to nearly 28,000 additional heat-related deaths annually in tropical regions between the years 2001 and 2020.

2. Deforestation in the Tropics

Tropical Forests - These are highly biodiverse ecosystems located primarily in the equatorial belt, with major concentrations in South America (the Amazon), Africa (the Congo Basin), and Asia (Southeast Asia).

Ecological Significance - Tropical forests are vital to global climate stability.

1. **Carbon Sinks -** They act as massive carbon sinks, absorbing and storing vast quantities of greenhouse gases through photosynthesis.
2. **Climate Regulation -** They play a crucial role in regulating the global hydrological cycle and weather patterns.

Scale of Forest Loss (2001-2020) - According to the study, a staggering 1.6 million square kilometers of tropical forest cover was lost globally during this period. The regional breakdown is as follows-

Central and South America- 760,000 sq. km

Southeast Asia- 490,000 sq. km

Tropical Africa- 340,000 sq. km

Snapshot- Forest Cover in India (ISFR 2023)

Total Cover- India's total forest and tree cover is 827,357 sq km, which accounts for 25.17% of the country's total geographical area. This consists of 715,343 sq km (21.76%) officially classified as forest cover and 112,014 sq km (3.41%) as tree cover.

Trends and Distribution-

1. **Top States (Increase in Forest & Tree Cover)-** Chhattisgarh, followed by Uttar Pradesh, Odisha, and Rajasthan.
2. **Top States (Increase in Forest Cover only)-** Mizoram, followed by Gujarat and Odisha.
3. **Top States (Largest Forest & Tree Cover by Area)-** Madhya Pradesh, followed by Arunachal Pradesh and Maharashtra.

3. Primary Causes of Deforestation

Agricultural Expansion- This is the single largest driver, especially in tropical regions. It involves clearing vast tracts of forest for large-scale commercial farming of commodities like soy, palm oil, beef, and cocoa.

Logging and Timber Extraction- Both legal and illegal harvesting of timber for wood, pulp, and paper products contribute significantly to forest loss and degradation. The construction of logging roads fragments ecosystems and opens up previously inaccessible forest areas to further destruction.

Infrastructure Development- The expansion of cities, construction of new roads and dams, and large-scale mining operations lead to the direct clearing of forested land and disrupt the surrounding ecosystems.

Unsustainable Subsistence Activities- In many rural areas, local populations rely on forests for their livelihood. This can lead to degradation through the unsustainable collection of fuelwood and the practice of shifting cultivation (slash-and-burn farming) where forest is cleared for temporary agriculture.

4. The Widespread Impacts of Deforestation

Release of Stored Carbon Dioxide- Tropical forests are immense carbon sinks, storing carbon in their biomass (trunks, leaves) and soils. When these forests are burned or cleared, this stored carbon is released into the atmosphere as CO_2, a primary greenhouse gas, thereby accelerating global warming.

Loss of Local Cooling Effect (Transpiration)- Trees and plants draw water from the soil and release it into the atmosphere as water vapor through a process called transpiration. This natural process has a significant cooling effect on the local air, much like a natural air conditioner. When forests are cleared, this vital cooling mechanism is lost, leading to a measurable increase in local surface temperatures.

Biodiversity Loss- Deforestation is a primary driver of biodiversity loss. It destroys the habitats of countless plant and animal species, pushing many towards extinction and disrupting vital ecosystem services they provide, such as pollination, seed dispersal, and maintaining soil fertility.

Human Health and Mortality- The study directly links deforestation-induced warming to an estimated 28,300 deaths annually. Extreme heat, especially when combined with high humidity, dramatically increases the risk of heat stroke, cardiovascular stress, and organ failure. Southeast Asia accounted for more than half of these deaths due to its high population density and the vulnerability of its population to extreme heat.

Socio-Economic Impacts- Deforestation disproportionately affects indigenous and rural communities who depend on forest resources for their livelihoods, food, and cultural practices. This often leads to loss of income, displacement, and social conflict.

5. Challenges in Addressing Deforestation

Economic Dependence- Many tropical countries rely heavily on revenue from agricultural exports and the timber trade, creating a powerful economic incentive that often conflicts with conservation goals.

Weak Governance- In many regions, poor enforcement of forest conservation laws, corruption, and unclear land tenure rights make it difficult to combat illegal logging and land grabbing.

Population Pressure- A rising global population increases the demand for food, land, and resources, putting continuous pressure on remaining forest areas.

Health Linkages- There is limited recognition in policy circles of the direct and deadly impact of deforestation on human health and mortality, making it harder to prioritize as a public health issue.

6. Global and Indian Initiatives to Counter Deforestation

Global Initiatives-

1. **UN-REDD Programme (2008)-** A joint effort of the FAO, UNDP, and UNEP, this UN programme aims to reduce emissions from deforestation and forest degradation in developing countries.
2. **The Paris Agreement (2015)-** This global climate accord explicitly acknowledges the crucial role of forests and includes provisions encouraging nations to reduce emissions from deforestation.
3. **Glasgow Leaders' Declaration on Forests and Land Use (2021)-** A commitment by over 140 countries to work collectively to halt and reverse forest loss by 2030.
4. **The Amazon Fund (2008)-** A pioneering fund designed to finance projects that prevent, monitor, and combat deforestation in the Amazon Biome.

India's Initiatives-

1. **National Mission for a Green India (GIM)-** A key mission under India's National Action Plan on Climate Change (NAPCC), it aims to increase forest cover and improve the quality of existing forests.
2. **Compensatory Afforestation Fund Act (2016)-** This Act mandates that any entity diverting forest land for non-forest purposes must pay compensatory levies, which are then used for afforestation and forest regeneration activities.

3. **Eco-Sensitive Zones (ESZs)-** These are designated buffer zones around National Parks and Wildlife Sanctuaries where certain activities are regulated to minimize impact on the fragile ecosystems.
4. **Joint Forest Management (JFM)-** A participatory governance model that fosters partnerships between state forest departments and local communities for the protection and management of forests.

7. The Way Ahead

1. **Strengthen International Cooperation-** Developed nations (Global North) must provide greater financial and technological support to developing nations (Global South) to help them transition to sustainable economic models that reduce reliance on deforestation.
2. **Integrate the Health Dimension-** The direct climate-health linkages of deforestation must be incorporated into national and international policy frameworks, treating forest conservation as a public health priority.
3. **Community Empowerment-** The rights and traditional knowledge of indigenous and local communities, who are often the most effective guardians of forests, must be recognized and integrated into conservation decision-making.
4. **Enhance Forest Monitoring-** Widespread use of advanced, satellite-based technologies for real-time tracking of deforestation is crucial.

Global Example- Global Forest Watch, supported by the World Resources Institute (WRI), provides a real-time monitoring system.

Indian Example- The Forest Survey of India (FSI) uses satellite data to produce its biennial State of Forest Reports.

Source- **https-//www.downtoearth.org.in/forests/deforestation-linked-heat-caused-nearly-28000-excess-deaths-a-year-in-the-tropics-in-2-decades**