



Chapter - 24 Environment

The Ministry of Environment, Forest and Climate Change (MoEF&CC) is the nodal agency in the central government for overseeing the implementation of India's environment and forest policies and programmes relating to conservation of the country's natural resources.

- MoEF&CC is also the nodal agency for the UNEP, International Centre for Integrated Mountain Development (ICIMOD) and the UN Conference on Environment and Development (UNCED).
- It also coordinates with multilateral bodies such as the Commission on Sustainable Development (CSD), Global Environment Facility (GEF) and regional bodies such as Economic and Social Council for Asia and Pacific (ESCAP) on matters pertaining to the environment.

Botanical Survey of India (BSI)

- **Established in 1890**
- BSI is the **apex research organization under MoEF&CC for carrying out taxonomic and floristic studies** on wild plant resources of the country.
- Reorganised by the Government of India in 1954 for scientific development.
 - Expanded functions include inventorying endemic, rare, and threatened plant species, conservation strategies, documentation of traditional knowledge, and development of national databases.

Zoological Survey of India (ZSI)

- **Established in 1916, headquartered in Kolkata** with 16 regional centres across the country.
- Conducts surveys, exploration, and research on India's diverse fauna.
- Functions include Environmental Impact Assessment, ENVIS on faunal diversity, enforcement of **Wildlife (Protection) Act, 1972** establishment of marine aquaria and museums, and custodianship of National Zoological Collections.

Forest Survey of India (FSI)

- **Established in 1981** to assess the country's forest resources regularly.
- **Succeeded the Preinvestment Survey of Forest Resources** initiated in 1965 by the Government of India with FAO and UNDP sponsorship.
- **Mandated by the National Commission on Agriculture in 1976** for comprehensive forest resources survey.
- Functions refined in 1986 to meet national aspirations.

Biodiversity Conservation

Convention on Biological Diversity (CBD):

- Adopted during the **Earth Summit in Rio de Janeiro in 1992**.
- **Objectives:** Conservation of biological diversity, sustainable use of its components, fair and equitable sharing of benefits from genetic resources.
- **India ratified CBD in 1994**, resulting in enactment of Biological Diversity (BD) Act in 2002 and

preparation of National Biodiversity Action Plan (NBAP) in 2008.

- **Nagoya Protocol adopted under CBD** in 2010 for fair and equitable sharing of benefits from genetic resources.

Biosphere Reserves:

- **Initiated by UNESCO** under its **Man and Biosphere (MAB) Programme in 1973-74.**
- Indian National MAB Committee identifies and recommends potential sites for Biosphere Reserves following UNESCO guidelines.
- **India has 18 designated Biosphere Reserves**, 10 included in UNESCO's World Network of Biosphere Reserves.

Biodiversity Conservation Scheme Relating to Biosafety:

- **Initiated in 1991-92** for coordination among agencies dealing with biodiversity conservation.
- **Objectives** include implementing Cartagena Protocol on Biosafety, UNEP-GEF Supported Capacity building Project on Biosafety, and strengthening Biosafety Management System.
- **Cartagena Biosafety Protocol (CPB) negotiated under CBD in 2000** aims to ensure safe transfer, handling, and use of living modified organisms resulting from modern biotechnology. India is a party to the Protocol.

Forest Conservation

Forest (Conservation) Act, 1980:

- Forest Conservation Division - Part of the MoEF&CC dealing with proposals for non-forestry use of forest land under the act.
- Act establishes regulatory mechanism to permit only essential use of forest land for various development projects:
 - Drinking water projects
 - Irrigation projects
 - Transmission lines
 - Railway lines
 - Roads
 - Power projects
 - Defence related projects
 - Mining

Forest (Conservation) Rules - 2022:

- Supersedes Forest (Conservation) Rules, 2003.
- Linear proposals, proposals involving forest land up to 40 hectares (except cases of de-reservation), mining proposals over 5 hectares, and regularisation of encroachments explicitly dealt by IROs.

Forest Fire Prevention and Management (FPM):

- Centrally Sponsored Scheme addressing forest fire management to mitigate adverse effects.

Forest Policy Division:

- Responsible for **National Forest Policy (1988)**, **Indian Forest Act (1927)**, and its amendments.
- Handles policy and legislative matters related to forests for ministries and state governments.

Wildlife Conservation

Ministry of Environment, Forests and Climate Change (MoEF&CC) Wildlife Division:

- Divided into Wildlife and Project Elephant Divisions. Includes autonomous bodies:
 - **Wildlife Institute of India (WII)** for research and training.
 - **Central Zoo Authority (CZA)** for conservation and zoo management.
 - **National Tiger Conservation Authority (NTCA)** for tiger conservation.
- **Asiatic Lion Conservation Programme:**
 - Launched in 2019 to protect and conserve Asiatic Lion population and its ecosystem.
- **Wildlife Crime Control Bureau (WCCB):**
 - Established in 2007 to combat organised wildlife crime.
 - Mandated to collect intelligence, establish a centralised wildlife crime database, coordinate actions, capacity building, and advise the government.
- **Central Zoo Authority (CZA):**
 - Established in 1992 to oversee zoo functioning and enhance their role in conservation.
- **Project Elephant (PE):**
 - Launched in 1991-92 to protect elephants, their habitat, address man-animal conflict, and ensure welfare of domesticated elephants.
- **National Tiger Conservation Authority (NTCA)/Project Tiger:**
 - NTCA constituted under Wildlife (Protection) Act, 1972, for strengthening tiger conservation.
 - Project Tiger launched in 1973 to fund tiger conservation in designated tiger reserves.
 - **Increased tiger reserves from 9 to 55 across 20 states**, ensuring in-situ conservation and preventing extinction.
 - NTCA conducts country-level tiger assessments every four years.
 - India currently harbours almost 75% of the world's wild tiger population.
 - The current tiger population in India is 3,167, up from 2,967 in 2018 as per the 5th cycle of All India Tiger Estimation.
 - International Tiger's Day on 29th July, conceived in 2010.
- **Cheetahs in India:**
 - Inter-continental large wild carnivore translocation project to reintroduce cheetahs in India.
 - Cheetahs released in Kuno National Park, Madhya Pradesh, to restore ecosystems and enhance biodiversity.

Environmental Impact Assessment (EIA)

- Planning tool to integrate environmental concerns into developmental processes from the initial planning stage.
- **Introduced in India in 1978** for river valley projects and extended to large public sector projects, codified in **EIA Notification, 1994**.
- Mandates environmental clearance for 37 project/process categories based on investment criteria.

Control of Pollution

- **Air Pollution:**
 - Regulated under Air (Prevention and Control of Pollution) Act, 1981 and Environment (Protection) Act, 1986.
 - PM 10 and PM 2.5 particles targeted for control.
- **Measures to Combat Air Pollution:**
 - **National Ambient Air Quality Standards** and emission/effluent standards notified under EPA, 1986.
 - **National Air Quality Monitoring Programme (NAMP)** for ambient air quality monitoring.
 - Steps include introduction of cleaner fuels, ethanol blending, **BS-IV to BS-VI fuel standards transition**, and implementation of **National Air Quality Index (AQI)**.
 - **Graded Response Action Plan for Delhi and NCR** region to control particulate matter levels.
 - **Comprehensive directions issued by CPCB** for implementation of air pollution mitigation measures.
- **National Clean Air Programme (NCAP):**
 - Implemented under the **Control of Pollution Scheme** since 2019.
 - National-level strategy to reduce air pollution levels in cities and regions.

- **Aims for 20-30% reduction in Particulate Matter** concentrations by 2024 in 131 identified non-attainment cities.
- **Launched "PRANA" portal** for monitoring NCAP implementation.

Hazardous Substance Management

- **Chemical Safety Rules:**
 - Two sets of rules under **EPA 1986:**
 - **Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (MSIHC).**
 - **Chemical Accidents (Emergency, Planning, Preparedness, and Response) Rules (EPPR), 1996.**
 - MSIHC aims to prevent major accidents from industrial activities and limit their effects.
 - EPPR provides administrative structure at national, state, district, and local levels for planning, preparedness, and response to chemical accidents.
- **Hazardous Waste Management Rules (2008 & 2016):**
 - Address environmentally sound management of hazardous waste.
 - Provisions for authorization of hazardous waste generating and using units.
 - Establishment of Treatment Storage and Disposal Facility (TSDF) for disposal.
 - Regulation of import/export of hazardous waste in accordance with Basel Convention.
 - **2016 Rules:**
 - Includes 'Other-Waste' to widen scope.
 - Replaces authorization and registration with a single permission for all stakeholders handling hazardous and other waste.
 - Incorporates a waste hierarchy prioritising prevention, minimization, reuse, recycling, recovery, co-processing, and safe disposal.
 - Simplifies import/export procedures.
 - Revises list of regulated waste categories.
 - Includes waste like metal scrap, paper waste, and various electrical and electronic equipment categories for reuse, exempted from requiring Ministry's permission.
 - Adds waste items like waste edible fats and oils, household waste, critical care medical equipment, solid plastic wastes, and other chemical wastes, especially in solvent form.

Solid Waste Management

Solid Waste Management Rules, 2016:

- **Applicability:** Extend beyond municipal areas to various urban areas, industrial townships, railways, airports, defence establishments, etc.
- **Generator Responsibilities:** Mandates segregation of waste into wet (biodegradable), dry (plastic, paper, metal, wood), and domestic hazardous waste.
- **Local Body Mandates:** Required to frame bye-laws for imposing user fees and spot fines for littering and non-segregation.
- **Responsibility Extension:** Requires resident welfare associations, market associations, and institutions in certain areas to develop in-house waste handling and processing arrangements.
- **Amendment:** Amended in 2020 to include villages with populations over 3,000.

Plastic Waste Management (Amendment) Rules, 2022:

- Plastic Waste Management Rules, 2016 amended to fast-track the elimination of single-use plastics and promote alternatives.
- **Classification of Plastics:**
 - Category 1: Rigid plastic packaging.
 - Category 2: Flexible plastic packaging, plastic sheets, carry bags, sachets, and pouches.
 - Category 3: Multi-layered plastic packaging.
 - Category 4: Compostable plastic packaging materials.
- **Plastic Packaging:** Mandates reuse of rigid plastic packaging to reduce fresh plastic usage.

- **Extended Producer Responsibility (EPR) Certificates:** Allows sale and purchase of surplus EPR certificates, establishing a market for plastic waste management.
- **Centralised Online Portal:** CPCB to establish a portal for registration and annual returns filing by producers, importers, brand-owners, and plastic waste processors by March 31, 2022.
- **Environmental Compensation:** Levies environmental compensation based on the polluter pays principle for non-fulfillment of EPR targets.
- **Committee for Recommendations:** CPCB committee to recommend measures for effective EPR implementation, including guideline amendments.
- **Annual Report on EPR Portal:** State PCBs to submit annual reports on EPR fulfilment by producers, importers, brand-owners, and waste processors to the CPCB.

International Conventions

Basel Convention:

- Adopted in 1989 in Basel, Switzerland.
- Aims to **protect human health and the environment from hazardous wastes.**
- Covers hazardous wastes and other wastes, such as household waste and incinerator ash.
- **India ratified the convention in June 1992.**

Rotterdam Convention:

- Came into force in 2004.
- Focuses on **prior informed consent for certain hazardous chemicals and pesticides in international trade.**
- **India acceded to the convention in 2005**, with Designated National Authorities in the Ministry of Agriculture and Farmers Welfare.

Stockholm Convention:

- Aims to protect human health and the environment from **persistent organic pollutants (POPs).**
- Started with 12 chemicals and now covers 23, targeting their restriction or elimination.
- **India ratified the convention in 2006** and developed a National Implementation Plan (NIP) through Global Environment Facility (GEF) funding.

Minamata Convention on Mercury:

- Adopted in 2013 in Minamata and Kumamoto, Japan.
- Aims to protect human health and the environment from the **adverse effects of mercury.**
- **India ratified the convention in 2018.**

Conservation of Wetlands

- Wetlands face pressures such as hydrological changes, siltation, pollution, invasive species, and over-harvesting.
 - The **National Wetland Conservation Programme (NWCP)** began in 1987 to assist state governments in conserving and managing wetlands.
- **India signed the Ramsar Convention in 1982** and currently has 80 Ramsar sites.
- The **Wetlands (Conservation and Management) Rules, 2010** were established to enforce Ramsar objectives, including the formation of the **Central Wetland Regulatory Authority (CWRA).**
- **World Wetland Day** is celebrated annually on February 2nd to raise awareness about wetland conservation.
- In 2021, the Ministry announced the launch of a Centre for Wetland Conservation and Management under the National Centre for Sustainable Coastal Management in Chennai.

Declaring Eco-Sensitive Areas in Western Ghats

- The Western Ghats is a global biodiversity hotspot and a treasure trove of biological diversity harbouring many endemic species of flowering plants, fishes, amphibians, reptiles, birds, mammals and invertebrates.
- The concept of Ecologically Sensitive Area (ESA) provides a mechanism to conserve biological diversity of an area while allowing for sustainable development to take place.

National Green Tribunal (NGT)

- **NGT was set up in 2010 under the NGT Act, 2010**, for the purpose of effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto.
- The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be **guided by principles of natural justice**.
 - It is mandated for disposal of applications or appeals finally within 6 months of filing.
- **NGT has five places of sitting, i.e., the Principal Bench in Delhi** and Zonal Benches in Pune, Kolkata, Bhopal and Chennai. Apart from this, the Tribunal holds three circuit Benches at Shimla, Shillong and Jodhpur.

Ozone Cell for Ozone Layer Protection

- Ozone, a triatomic molecule of oxygen, is formed from oxygen naturally in the upper levels of the earth's atmosphere by high energy ultraviolet (UV) radiation from the sun.
 - The UV radiation breaks down oxygen molecules, releasing free atoms, some of which bond with other oxygen molecules to form ozone.
 - About 90% of ozone formed in this way lies between 10 and 50 kilometres above the earth's surface, called the **Stratosphere**.
- The ozone found in the part of the atmosphere is called the ozone layer. The ozone layer absorbs all the harmful UV-B radiations emanating from the sun.
 - The UV-B radiation has the potential to cause skin cancer, eye cataract, suppress body's immune system, decrease crop yield etc., which led to the adoption of the **Vienna Convention for the Protection of the Ozone Layer in 1985** and the **Montreal Protocol on Substances that Deplete the Ozone Layer in 1987**.
 - All the 197 UN member countries of the world are the parties to the Vienna Convention and its Montreal Protocol.
 - The mandate of the Montreal Protocol is to phase out the production and consumption of the Ozone Depleting Substances (ODSs).
 - **India is a party to the Vienna Convention and the Montreal Protocol.**