

CHAPTER 33

ENVIRONMENT AND FOREST

India has always been in the forefront of preserving biodiversity, sustainable management of forests, reducing emissions intensity, and following sustainable consumption and production patterns. Specifically, India has been following a development path that takes into consideration the needs of the present generation without compromising the ability of future generations to meet their needs. Suitable attention has been given to protecting and conserving critical ecological systems and resources and invaluable natural and man-made heritage, which are essential for life-support, livelihoods, economic growth, and a broad conception of human well-being. Moreover, the effort has been to ensure equitable access to environmental resources and quality for all sections of society, in particular to ensure that poor communities which are most dependent on environmental resources for their livelihoods are assured secure access to these resources.

Recent Initiatives

In order to ensure that there is no further degradation of wetlands, the Ministry of Environment and Forests, Government of India has notified the Wetlands (Conservation and Management) Rules 2010. The rules specify activities which are harmful to wetlands such as industrialization, construction, dumping of untreated waste and reclamation and prohibit these activities in the wetlands. Other activities such as harvesting and dredging may be carried out in the wetlands but only with prior permission from the concerned authorities.

The National Green Tribunal (NGT) Act, 2010 came into force on 18th October, 2010. As per the provisions of the NGT Act 2010, the National Environment Appellate Authority (NEAA), established under the NEAA Act, 1997 stands dissolved and the cases pending before NEAA stand transferred to the NGT. The Act provides for the establishment of a NGT for the 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.

Coastal ecosystems are a critical reservoir of our biodiversity and provide protection from natural disasters such as floods and tsunamis and are a source of livelihood to hundreds of millions of families. Hence, as a major national initiative in this direction, the Coastal Regulation Zone Notification has been published in the gazette of India on 6th January, 2011. The government of India and world Bank have signed a loan agreement for the implementation of an integrated coastal Zone Management Project, which will be implemented at a total cost of ₹ 1156 crore. The World Bank will contribute an amount of ₹ 897 crore (77.7 per cent), the Government of India ₹ 177 Crore (15.4 per

cent), and the States ` 80 Crore (6.9 per cent). This project is for a period of five years and it is estimated that it will benefit 3.56 crore people directly 6.30 crore indirectly.

Climate Change

India has always maintained that economic and social development is its prime objective. At the same time, it has promoted clean energy solutions which include activities aimed at promotion of energy efficiency in industrial, residential and commercial use, solar power and projects that build fuel efficient transport infrastructure, clean energy hydro power plants, and efficient water supply and waste water systems. India also has programmes aimed at building a climate-resilient economy especially for helping farmers, fishing communities, and other vulnerable communities safeguard their livelihoods against the vagaries of a changing climate.

Climate change, as a global environmental problem has been receiving intense political attention at domestic and international levels. '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 fuel burning and land use changes have emitted, and are continuing to emit, greenhouse gases (mainly carbon dioxide (CO₂), methane, and nitrous oxide) into the earth's atmosphere. This increasing level of emissions of greenhouse gases has caused a rise in the amount of heat from the sun trapped in the earth's atmosphere, heat that would normally be radiated back into space. This has led to the major characteristics of climate change are rise in average global temperature, ice cap melting, changes in precipitation, and increase in ocean temperature. The efforts needed to address the climate change problem include mitigation of greenhouse gas emissions on the one hand and building of capacities to cope with the adverse impacts of climate change on various sectors of the society and economy on the other.

According to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007), over the century, atmospheric concentrations of carbon dioxide increased from a pre-industrial value of 278 parts per million to 379 parts per million in 2005, and the average global temperature rose by 0.74°C. Projections indicate that global warming will continue and accelerate. Thus climate change represents additional stress on ecological and socio-economic systems that are already facing tremendous pressure due to rapid economic development. With climate change, the type, frequency, and intensity of extreme events, floods, and droughts are expected to increase. Hence addressing climate change is a major challenge in terms of policies and resources needed to address it at domestic and international levels.

Global Greenhouse Gas (GHG) emissions have risen sharply since 1945. As per a working paper published by the World Resources Institute, total GHGs were estimated at 44,153 MtCO₂ equivalents (million metric tons) in 2005. This is the most recent year for which comprehensive emissions data are available for every major gas and sector (Box 12.10). Total global emissions grew by 12.7 per cent between 2000 and 2005, an annual average of 2.4 per cent. CO₂ is the predominant gas accounting for 77 per cent of world GHG emissions in 2005 followed by methane (15 per cent) and nitrous oxide (7 per cent).

North America accounted for 18 per cent of world GHG emissions, China for 16 per cent, and the EU for 12 per cent in 2005. India's share stood at 4 per cent in 2005.

While the worldwide emissions of GHGs have increased since 1945, with the largest increases taking place in carbon dioxide (CO₂) emissions, scientists attribute the global problem of climate change not to the current GHG emissions but to the stock of historical GHG emissions. Most of the countries, particularly the industrialized countries, having large current emissions are also the largest historic emitters and the principal contributors to climate change. A relatively small number of such countries are responsible for the largest chunk of the stock of global GHG emissions. The industrialized countries with the largest total emissions also rank among those with the highest per capita emissions. Per capita emissions are generally higher in wealthier countries.

India's Greenhouse Emissions

Although India ranks in the top five in terms of GHG emissions, the per capita emissions are much lower compared to those of the developed countries, even if the historical emissions are excluded. Its high level of emissions is due to large populace, geographical size and large economy. The most recent data available for India are the assessment carried out by the Indian Network for Climate change assessment (INCCA) in May 2010. The key results of the assessment are that the total net GHG emissions from India in 2007 were 1727.71 millions of CO₂ equivalent (eq.) of which carbon dioxide emissions were 1221.76 million tons, methane 20.56 million tons and nitrous oxide 0.24 million tons.

Climate change has enormous implications for the natural resources and livelihoods of the people. It will have wide-ranging effects on the people. It will have wide-ranging effects on the environmental and socio-economic and related sectors. Various studies indicate that the key sectors in India such as the agriculture, water, natural ecosystem, biodiversity and health are vulnerable to climate change. This is happening precisely at a time when it is confronted with huge development imperatives. The Indian Network for climate change Assessment (INCCA) released a report in November 2010 on assessment of the impact of climate change on key sectors and regions of India in the 2030s. The assessment covers four key sectors of the Indian economy, namely biodiversity, and health in four climate sensitive Ghats, the Coastal Area, and the North-east region. The report warns of impacts such as sea-level rise, increase in cyclonic intensity, reduced crop yield in rainfed crops, stress on livestock, reduction in malaria. This calls for urgency of action in reducing vulnerability to adverse impacts of climate change and enhancing adaptive capacity through sector-specific interventions and efforts.

Survey of Flora

The Botanical Survey of India (BSI) is the apex research organization under the Ministry of Environment and Forests, Government of India for carrying out taxonomic and floristic studies on wild plant resources of the country. It was established on 13th February, 1890 with the basic objective to explore the plant resources of the country and to identify the plants species with economic virtues. After independence the department was

reorganized in 1954 by Government of India as a part of scientific development of the country.

The Zoological Survey of India (ZSI) a premier institute under the Ministry of Environment and Forests, has been undertaking exploration and research on the exceptionally rich faunal diversity of this country since its inception in 1916, with its Headquarters at Kolkata and sixteen regional centres located in different parts of the country. In recent years, ZSI has reoriented its plan to work by grouping the survey and studies under six major programmes as follows: (i) Study of the fauna of states (ii) Fauna of conservation areas (iii) Fauna of important ecosystems (iv) Status survey of endangered species (v) Fauna of India and (vi) Ecological Studies & Environmental Impact Assessments (EIA). ZSI is recognized as the repository of Zoological specimens by MoEF under Biological Diversity Act, 2002. Its' Andaman and Nicobar Regional Centre have been recognized as lead institute under UNESCO.

Forest Resources and Survey

The Forest Survey of India (FSI) is located at Dehradun and its four zonal offices are located at Shimla, Kolkata, Nagpur and Bangalore. FSI is a national level organization for forest resource assessment of the country under the Ministry of Environment and Forests, Government of India. The main objectives of FSI include (1) to assess the forest cover of the country through Remote Sensing technology, analyze the changes and prepare State of Forest Report biennially; (2) conduct inventory in forests and non-forest areas at national level and develop database on wood volume and also estimate tree cover; (3) function as a nodal agency for collection, compilation, storage and dissemination of spatial database on forest resources etc.

Forest cover: India's forest cover in 2007 is 21.02% of the geographical area. 2.54% is very dense forest, 9.71% is moderately dense forest, and the rest 8.77% is open forest; including 0.46 million hectare mangroves. Excluding the area (18.31 million hectare) above tree line, the forest cover of the country comes of 22.26%. The North-East region of the country comprising States, account for about 8% of the geographic area of the country, but nearly one fourth of its forest cover.

Mangroves cover: Mangroves comprise salt-tolerant, evergreen, broad leaved trees having aerial roots like pneumatophores or stilt roots and viviparous germinated seedlings found mainly in tropical and subtropical inter-tidal regions of the world. Mangroves in India cover 4,639 km² showing a net increase of 58 km² over the previous assessment figures. West Bengal has nearly half of the country's mangroves.

Tree cover: India's tree cover (comprising sub hectare tree patches outside forest cover) has been estimated as 92,769 km² constituting 2.82% of geographical area of the country. Excluding the area above tree line, it comes to 2.99%.

Environmental Conservation

The National Environment Policy, 2006 recognizes that mangroves and coral reefs are an important coastal environmental resource. They provide habitats for marine species; protection from extreme weather events; and a resource base for sustainable tourism. The major efforts made on environmental Conservation are as under:

Coral Reefs: The four major coral reefs areas identified for intensive conservation and management are (1) Gulf of Mannar, (2) Gulf of Kutch, (3) Lakshadweep, and (4) Andaman and Nicobar Islands. The emphasis is on preventive aspects through monitoring and surveillance as the restoration work is both costly and time consuming. The Government of India is assisting to the State Forest Departments of all the four identified coral reefs areas in the country for activities like monitoring, surveillance, education & awareness. The Indian reef area is estimated to be 2,375 km². For encouraging targeted research on both hard and soft corals in the country, a National Coral Reef Research Centre at Port Blair has been established.

Forest Conservation:

The Forest Division of the Ministry of Environment and Forest has six Regional Offices located at Bangalore, Bhopal, Bhubaneswar, Lucknow, Shillong and Chandigarh with its Headquarter in the Ministry at New Delhi. The primary function of the Regional Offices is to monitor and evaluate the ongoing forestry projects and schemes with specific emphasis on conservation of forests and follow up action on the implementation of conditions and safeguards laid down by the Ministry while granting clearance to development projects under Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986.

Wildlife Conservation:

Realizing the huge task of conserving India's wildlife resources, the National Wildlife Action Plan (2002-2016) was adopted, emphasizing the need for peoples' participation and support for wildlife conservation. Wildlife Wing in the Ministry of Environment and Forest is apex body for wildlife conservation.

Central Zoo Authority: Zoos in India are regulated as per the provisions of the Wild Life (Protection) Act, 1972 and are guided by the National Zoo Policy, 1998. The Central Zoo Authority was established by the Government of India in the year 1992 through an amendment in the Wild Life (Protection) (1991 amendment) Act, 1972. The main objective was to enforce minimum standards and norms for upkeep and health care of animals in India zoos and restrain mushrooming of unplanned and ill conceived zoos. Recognition of Zoo Rules, 1992 was revised and notified on 11.11.2009.

Project Tiger: The Project Tiger was launched in April, 1973 with the objective "to ensure maintenance of a viable population of Tigers in India for scientific, economic, aesthetic, cultural and ecological values, and to preserve for all times, areas of biological importance as a national heritage for the benefit, education and enjoyment of the people." For

effectively control illegal trade in wildlife, a multidisciplinary Tiger and Other Endangered Species Crime Control Bureau (Wildlife Crime Control Bureau) has been constituted with effect from 6.6.2007.

Project Elephant: Project Elephant was launched in 1991-92 with objectives (1) to protect elephants, their habitat & corridors, (2) to address issues of man- animal conflict, and (3) welfare of domesticated elephants. Financial and technical support is being provided to major elephant bearing States in the country.

Highlights :

- The actual forest cover increased from 653898 sq km in 2001 to 690899 sq km in 2009. The area under dense forest increased from 395169 sq km to 402522 sq km and area under open forest increased from 258729 sq km to 288377 sq km, whereas, the areas under mangroves increased from 4482 sq km to 4581 sq km and area under scrub increased from 47318 sq km to 41525 sq km during the same period.
- The recorded area under forest increased from 768436 sq km in 2001 to 769512 sq km in 2009. The area under reserved forest increased from 423311 sq km to 430582 sq km and area under protected forest decreased from 217245 sq km to 206219 sq km, whereas, the areas under unclassified forest increased from 127811 sq km to 132711 sq km during the same period.
- The tree cover area increased from 81471 sq km in 2001 to 92769 sq km in 2007, whereas mangrove cover area increased from 4482 sq km to 4639 sq km during the same period.
- There are 100 national parks with total area of 38024 sq km, whereas, there were 514 wildlife sanctuaries with area as 155980 sq km in 2009.
- There were 1228103 numbers of taxonomic species in the world, out of which, 91206 (7.43%) were Indian species.
- The estimated population of tigers was between 1165 to 1657 in 2007-08, whereas, the estimated population of elephants was between 27669 to 27719 in 2007.
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- The revenue from forest increased from ` 15.24 billion in 2000-01 to ` 21.81 billion in 2007-08, whereas, expenditure on forest increased from ` 33.87 billion to ` 37.16 billion during the same period.

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