



पर्वतों के वसिवासी ।
पर्वतों के सुरक्षार्थी ॥

Ministry of Environment and Forests
GOVERNMENT OF INDIA

REPORT TO THE PEOPLE ON ENVIRONMENT AND FORESTS 2010-11



REPORT TO THE PEOPLE ON ENVIRONMENT AND FORESTS 2010-11



XI Conference of Parties
UN Convention on Biological Diversity
HYDRABAD-INDIA 2012



सत्यमेव जयते



वर्षा है हरियाली ।
बर्षा है सुराहाली ॥

Ministry of Environment and Forests
Government of India

© Ministry of Environment and Forests, Government of India, 2011

Material from this publication may be used for educational purposes provided due credit is given.
Material from this publication can be used for commercial purposes only with the permission from the Ministry of Environment and Forests.

Overall guidance

Ms. Mira Mehrishi, Additional Secretary, Ministry of Environment and Forests, Government of India

Project Team

Ministry of Environment and Forests

Mr. Nilkanth Ghosh, Statistical Advisor

Dr. P. S. Rawat

Development Alternatives

Mr. George C Varughese

Mr. Anand Kumar

Mr. Avanindra Kumar

Ms. Kavita Syal

Mr. Rajiv Gupta

Layout & Printing

Ministry of Environment and Forests

K. K. Graphics

Grover Enterprises

Cover Design

Mr. Kamal Kumar



जयंती नटराजन
Jayanthi Natarajan



राज्य मंत्री (स्वतंत्र प्रभार)
पर्यावरण एवं वन मंत्रालय
भारत सरकार
नई दिल्ली - 110 003

MINISTER OF STATE (INDEPENDENT CHARGE)
ENVIRONMENT & FORESTS
GOVERNMENT OF INDIA
NEW DELHI - 110 003

Foreword

The survival of mankind depends almost entirely on preservation of nature. India was one of the foremost nations to conceptualize sustainable development thereby underscoring that environmental concern and issues cannot be isolated from livelihood and continuity of mankind. In a prophetic speech in Stockholm Conference in 1972, former Prime Minister, Smt. Indira Gandhi had raised an important question namely; "Are not poverty and need the greatest polluters?" In response to the prophetic question, it can only be highlighted that poverty alleviation measures may go a long way to redefine sustainable development through reducing emissions, preserving bio-diversity, protecting flora and fauna of the country and wildlife and through pivotal acts-the Air Act, Water Act and Forests (Conservation) Act as well as the Environment (Protection) Act.

The Ministry having made a number of sincere efforts to lead from the front have been striving to meet the environmental challenges with success. In this context, I am pleased to release the second "**Annual Report to the People on Environment 2010-11**" prepared by the Ministry of Environment and Forests, which is the nodal Ministry in our administrative system for planning, promotion, coordination and overseeing the implementation of environmental and forestry programmes in order to protect the environment and maintain a balance between conservation and development activities. The first such report was initiated when the Hon'ble President of India in her address to the Joint Session of Parliament on 4th June, 2009 announced the preparation of five Annual Reports to the people, including a Report on Environment.

This document is an indicative and not an exhaustive report of the initiatives taken up by the Ministry in the year 2010-11. A number of issues have been highlighted so as to initiate a debate on some of the significant environmental concerns in the country. It is expected that this report will provide an informative, even if, brief reading for all who are passionately interested in conserving environment and we hope to receive feedback particularly on the matters which influence the pressing environmental challenges in our country.

Jayanthi Natarajan
(Jayanthi Natarajan)





सचिव
भारत सरकार
पर्यावरण एवं वन मंत्रालय
Secretary
Government of India
Ministry of Environment and Forests



तिष्यरक्षित चटर्जी
Dr. Tishya Chatterjee

Preface

The Annual Report to the People on Environment and Forests 2010-11 presents an overview of programmes, policies and major initiatives of the Ministry of Environment and Forests in the year 2010-11 on Environment and Forestry related issues.

The objective of the report is to generate a national debate among various stakeholders and public at large on key environmental and forestry-related issues and challenges ahead that need to be addressed in the overall framework of sustainable development.

I hope the report will generate interest and the Ministry will receive constructive and positive feedback resulting in strengthening the capacity of the Ministry as well as its institutional structure to meet the future challenges in Environment Management.

(T. Chatterjee)



Content

Foreword	iii
Preface	v
List of abbreviations	xi
Executive Summary	xiii
Chapter 1 Mandate of the Ministry of Environment and Forests	
1.1 Need for the Report	1
1.2 Mandate of the Ministry	1
1.3 Key Achievements in 2010-11	1
1.3.1 Climate Change	1
1.3.2 Green India Mission	3
1.3.3 Mission Clean Ganga	3
1.3.4 Coastal Regulation Zone	3
1.3.5 Initiatives for the Rights of Forest Dwellers	4
1.3.6 Pollution Control	4
1.3.7 Issues of Genetically Modified Food Crops	5
1.3.8 Biosafety	5
1.3.9 Renewed Impetus to Science	5
1.3.10 Western Ghats	5
1.3.11 Himalayas	6
1.3.12 Sundarbans	6
1.3.13 Transparency in Environmental and Forestry Clearances	6
1.3.14 Website	6
1.3.15 Biodiversity	6
1.3.16 Wildlife	7
1.3.17 National Green Tribunal	8
1.4 Goals for the Next Year (2011-12)	8
Chapter 2 State of the Environment	
2.1 Introduction	11
2.2 Air Environment	11
2.2.1 Ambient Air Quality	11
2.2.2 Indoor Air Pollution	12
2.2.3 Impacts and Key Issues	12
2.2.4 Policy and Legal Measures	12
2.3 Water Environment	12

2.3.1	Impacts and Key Issues	13
2.3.2	Conservation of Rivers	13
2.3.3	Water Quality Monitoring of Rivers	13
2.3.4	Policy and Legal Measures	13
2.3.4.1	National River Conservation Plan	13
2.3.4.2	National Lake Conservation Plan	14
2.3.4.3	National Wetland Conservation Programme	14
2.3.5	Recent Initiatives	14
2.4	Solid Waste Management	14
2.4.1	Impacts and Key Issues	15
2.4.2	Policy and Legal Measures	15
2.4.3	Recent Initiatives	15
2.4.3.1	Treatment/Disposal Facilities	15
2.4.3.2	Co-incineration of High Calorific Value Waste	16
2.4.3.3	Hazardous Waste Management	16
2.4.3.4	Clean Technology Initiatives	16
2.4.3.5	Waste Minimisation Circles	16
2.4.3.6	Fly ash Utilisation	16
2.4.3.7	Inventory of Abandoned Dumps	16
2.4.3.8	Common Biomedical Waste Treatment Facilities	17
2.4.3.9	Mass Awareness	17
2.5	Forestry	17
2.5.1	Impacts and Key Issues	17
2.5.2	Policy and Legal Measures	17
2.5.3	Externally Aided Projects	18
2.5.4	Recent Initiatives	18
2.6	Biodiversity and Wildlife	18
2.6.1	Impacts and Key Issues	19
2.6.2	Policy and Legal Measures	19
2.6.3	Recent Initiatives	20
2.7	Coastal Resource Management	20
2.7.1	Policy and Legal Measures	20
2.7.2	Recent Initiatives	20
2.8	Climate Change and its Impact	21
2.8.1	Projected Impacts	21
2.8.2	Recent Initiatives	21
2.9	Biosafety	22
2.9.1	Policy and Legal Measures	22
2.9.2	Recent Initiatives	23
2.10	Environment Education, Awareness and Training	23
2.11	Environmental Information System	25

Chapter 3 Need for Inclusive Growth	
3.1 Introduction	27
3.2 Current Initiatives	27
3.3 Environmental Awareness	28
3.4 Environmental Communication	28
3.5 Women Empowerment	28
Chapter 4 Issues for Debate	
4.1 Introduction	31
4.2 Issues Affecting the Environment	31
4.3 Air Environment	32
4.4 Noise Environment	32
4.5 Water Environment	32
4.6 Solid Waste Management	32
4.7 Forestry	33
4.7.1 Low Productivity	33
4.7.2 Ownership and Management	33
4.8 Biodiversity and Wildlife	33
4.9 Biosafety	33
4.10 Coastal Resource Management	34
4.11 Climate Change	34

List of abbreviations

ALRI	Acute Lower Respiratory Infection	GEF	Global Environment Facility
AR4	Fourth Assessment Report	GSHE	Governance for Sustaining Himalayan Ecosystem
BFR	Brominated Flame Retardants	CETP	Common Effluent Treatment Plant
BMC	Biodiversity Management Committee	HPMP	HCFC Phase-out Management Plan
BMW	Biomedical waste	HCF	Health Care Facility
CCEA	Cabinet Committee on Economic Affairs	HFC	Hydroflourocarbon
CPB	Cartagena Protocol on Biosafety	IIT	Indian Institute of Technology
CPCB	Central Pollution Control Board	INCCA	Indian Network for Climate Change Assessment
CZA	Central Zoo Authority	ICZM	Integrated Coastal Zone Management
COPD	Chronic Obstructive Pulmonary Disease	IPR	Intellectual Property Rights
CRZ	Coastal Regulation Zone	ICIMOD	International Centre for Integrated Mountain Development
CSD	Commission on Sustainable Development	IPPC	International Plant Protection Convention
CoP	Conference of the Parties	IPZ	Island Protection Zone
CBD	Convention on Biological Diversity	ISFR	Indian State of Forest Report
CFC	Chloroflouro Carbon	JFMC	Joint Forest Management Committee
CTC	Carbon Tetrachloride	JICA	Japan International Cooperation Agency
DBT	Department of Biotechnology	LMO	Living Modified Organisms
DLC	District Level Committee	LCS	Low Cost Sanitation
ESA	Ecologically Sensitive Area	MAI	Mean Annual Increment
ESCAP	Economic and Social Council for Asia and Pacific	MoA	Memorandum of Agreement
ENVIS	Environmental Information System	MDI	Metered Dose Inhaler
EUN	Essential Use Nomination	MT	Metric Tonne
GAP	Ganga Action Plan	MLD	Million Litres per Day
GEAC	Genetic Engineering Approval Committee	MoEF	Ministry of Environment and Forests
GMO	Genetically Modified Organism	MEC	Monitoring cum Evaluation Committee
GANGES	Global Advisory Network Group on Environmental Sciences		

Annual Report to the People on Environment and Forests

MLF	Multilateral Fund	RDAC	Recombinant DNA Advisory Committee
MTA	Metric Tonnes per Annum	RCGM	Review Committee on Genetic Manipulation
NAPCC	National Action Plan on Climate Change	REDD	Reduced Emissions from Deforestation and Degradation
NAEB	National Afforestation & Eco-Development Board	RFD	River Front Development
NAAMP	National Ambient Air Monitoring Programme	SoE	State of Environment
NBA	National Biodiversity Authority	SSI	Small Scale Industry
NCZMA	National Coastal Zone Management Authority	SSFE	Small-Scale Forestry Enterprises
NEAMA	National Environment Assessment and Monitoring Authority	SICOM	Society of Integrated Coastal Management
NEP	National Environment Policy	SACEP	South Asia Co-operative Environment Programme
NEPA	National Environment Protection Authority	SAARC	South Asian Association for Regional Cooperation
NEERI	National Environmental Engineering Research Institute	SAPCC	State Action Plan on Climate Change
NGRBA	National Ganga River Basin Authority	SBB	State Biodiversity Board
NGT	National Green Tribunal	SBBC	State Biotechnology Coordination Committee
NLCP	National Lake Conservation Plan	SLAPCC	State Level Action Plans for climate change
NMSHE	National Mission for Sustaining the Himalayan Ecosystem	SPCBs	State Pollution Control Boards
NOC	No Objection Certificate	SRCA	State River Conservation Authority
NRCD	National River Conservation Directorate	TEEB	The Economics of Ecosystem and Biodiversity
NRCP	National River Conservation Plan	TSDF	Treatment, Storage and Disposal Facility
NTCA	National Tiger Conservation Authority	VDS	Very Dense Forests
NTFP	Non Timber Forest Product	UNEP	United Nations Environment Programme
NWCP	National Wetlands Conservation Programme	UNFCCC	United Nations Framework Convention on Climate Change
ODS	Ozone Depleting Substances	ULB	Urban Local Bodies
ODP	Ozone Depleting Potential	UNCED	United Nations Conference on Environment and Development
PRI	Panchayati Raj Institutions	WMC	Waste Minimization Circles
PA	Protected Areas	WGEEP	Western Ghats Ecology Expert panel

Executive Summary

The Ministry of Environment and Forests (MoEF) implements policies and programmes relating to conservation of the country's natural resources, including lakes and rivers, biodiversity, forests and wildlife, ensuring the welfare of animals and prevention & abatement of pollution.

The 'Annual Report to the People on Environment and Forests' is trying to make the citizens of India aware of our country's State of Environment and generate greater environmental consciousness amongst them. The objective of the report, therefore, is to act as a positive catalyst to initiate a national debate to raise the crucial environmental issues facing the nation and attempt to seek appropriate solutions paving the way for an eco-friendly development path.

This Report comprises of four chapters. The First Chapter encompasses the basic role and the mandate of the Ministry and elaborates upon the need for such a people-oriented document. This chapter also focuses on the major policies and programmes of the Ministry its achievements for 2010-11 and goals for 2011-12.

The Second Chapter unfolds the state of India's environment. It dwells upon: air quality, noise issues, water environment, solid waste management, forestry, bio-diversity and wildlife, coastal resource management and climate change. These themes present their current state and issues of concern, related policies as well as legal measures and recent initiatives taken by the Ministry to address these challenges.

The Third Chapter highlights the need for inclusive growth, while the Fourth Chapter presents issues for debate on each of these themes in detail.

The key issue of air pollution and the resultant ambient air quality can be attributed to emissions from transportation, i.e., road, rail, shipping and airways, industrial and domestic activities. The air quality has been an issue of social concern in the backdrop of various developmental activities. The norms for ambient air quality have been revisited and various industry-specific emission standards have been evolved afresh and notified, as the case may be. In fact, 446 ambient air quality monitoring stations have been operationlized in 182 cities/towns in 26 States and five Union Territories.

The issue of Noise has been a matter of concern in urban environment. A bilingual booklet has been brought out on Noise Pollution (Regulation and Control) Rules, 2000 by incorporating all amendments in Noise Rules for creating mass awareness. A beginning to monitor ambient noise has been made during the year, starting from seven metro cities.

Regarding the vital issue of conservation and cleanliness of India's water resources, the increasing population, urbanization, and growing demand from agriculture and industry have put a heavy burden on our water environment. The pollution load on rivers has increased over the years due to rapid urbanization and industrialization. Abstraction of water for irrigation, drinking, industrial use, and power-generation compounds the challenge.

The National River Conservation Plan (NRCP) includes works in 190 towns along polluted stretches of 39 rivers spread over 20 states. So far, under the National Lake Conservation Plan (NLCP), a total of 41 projects for conservation of 61 lakes have been sanctioned in 14 states at a sanctioned cost of Rs.1028.19 crores. Under the Mission Clean Ganga, the Ministry ensures that by 2020, no untreated municipal sewage and industrial effluents flow into the River Ganga. In fact, the water quality of River Ganga has improved in terms of BOD, despite the population increase, as a result of implementation of pollution abatement works.

Solid waste generation is predominantly an industrial and urban problem, aggravated due to increasing consumerism, resulting from rapid urbanization and economic growth. There is a need to set up adequate waste collection, processing, and disposal facilities to cope with the rising levels of waste generation to protect human health and the environment. Financial assistance has been provided to various State Pollution Control Boards for conducting awareness and training programmes on management of municipal solid waste and plastic waste. For treatment and disposal of bio-medical waste, there are 177 common treatment and disposal facilities across India. CPCB is conducting trial runs for co-processing of hazardous and other industrial wastes. Ministry is also taking steps to curb E-waste, or electronic waste, which may exceed eight lakh

tonnes by 2012. The draft notification of E-waste (Management and Handling) Rules was published by the ministry in May 2010. The concept of Extended Producer Responsibility (EPR) is introduced in these proposed rules as this strategy makes the producer (of electronic/electric equipment) responsible for the entire life cycle of the product, including its recycling and final disposal.

In order to deal with the critical issues like deforestation, degradation of our forests, along with the sustenance of forest-dependent communities, the National Afforestation and Eco-Development Board is providing support, both in physical and capacity-building terms, to the Forest Development Agencies (FDAs) through the National Afforestation Programme (NAP) to provide impetus to the institutionalization of Joint Forest Management (JFM). In 2010-11, State Forest Development Agency (SFDA) has been constituted to facilitate the fund flows to FDAs.

Biodiversity conservation is also one of the key issues of concern, witnessing the rise in the cases of bio-piracy in India. The Convention on Biological Diversity (CBD), adopted during the Earth Summit, in 1992, is the first comprehensive global agreement addressing all aspects pertaining to biodiversity. CBD highlights the urgent need to resolve complexities in access and benefit sharing of the available resources to ensure their benefits reach the traditional users. India has been very active in all international biodiversity negotiations, including the tenth biennial meeting of the Conference of Parties (CoP-10) to the CBD, held in Nagoya in October, 2010. Considering that India would be hosting the CoP-11 in October 2012, it has the opportunity to emerge as a world leader in conservation and sustainable use of biodiversity, and also set the global agenda for the coming decade for biodiversity in the context of sustainable livelihoods.

'Project Tiger' was launched in April 1973, with the view to protect our national animal and ensure maintenance of available population of tigers in India for scientific, aesthetic, cultural and ecological values. The Ministry is providing support for protection, conservation and development of tiger reserves.

This year, the Ministry has provided funding support to 39 tiger reserves in 17 states; reintroduced tigers in Sariska and

Panna tiger reserves, where tigers have become locally extinct; launched 'M-STRIPES' - a monitoring system for intensive protection of tigers; and signed a joint resolution with Nepal on 29th July, 2010 for trans-border biodiversity and tiger conservation. Officers from the Ministry recently participated in the International Tiger Forum (Global Tiger Summit) at St. Petersburg, Russia to endorse the Global Tiger Recovery Programme for tiger conservation at the global level.

Mangroves play a vital role in protecting the coastal areas from the tidal waves and the coral reefs play a similar role in conserving the coastal ecology. But, the existence of mangroves and corals seems to be in danger due to several developmental activities. India is home to some of the best mangroves in the world. The project titled "*Mangroves for Future (MFF): a strategy for promoting investment in Coastal Ecosystem Conservation*" is being coordinated by IUCN and Natural Resources, covering initially eight countries (including India) in south and South East Asia and western Indian Ocean. The Ministry has constituted a national coordination body to oversee and guide the entire India country programme under this IUCN-MFF (India) Programme as well as to review, monitor and evaluate its implementation.

In order to address the coral reef issue, Ministry has established a National Coral Reef Research Centre at Port Blair, under the International Coral Reef Initiative (ICRI), which is a partnership among governments, international organizations and NGOs across the globe.

The Ministry has been very active in terms of addressing the Climate Change issue that is bound to impact several natural and human systems. India participated in the sixteenth Conference of parties (CoP-16) to UNFCCC held at Cancun during November 29 - December 10, 2010 and the Durban Convention in South Africa (in December, 2011), resulting in important decisions on the global issues under negotiations. The Ministry has adopted the National Action Plan on Climate Change (NAPCC), which has a mix of both mitigation and adaptation measures. The Eight National Missions, which form the core of the National Action Plan, represent multi-prolonged, long term and integrated strategies for achieving key goals in the context of climate change.



Mandate of the Ministry of Environment and Forests

1.1 Need for the Report

This report is an annual feature of the Ministry of Environment and Forests with the view to monitor and review the various measures taken by the Government to strengthen the policy and regulatory frameworks pertaining to the environment and forests of the country. A number of steps have been taken in the last one year, in terms of institutional and legislative initiatives. In fact, while some of the programmes and schemes have been strengthened/implemented, some of the new ones have also been initiated.

The three laws governing the thrust of the Ministry are - the Environment (Protection) Act, 1986, the Forest (Conservation) Act, 1980 and the Wildlife (Protection) Act, 1972. These laws not only provide the appropriate legislative protection, but also the requisite authority to the Ministry to undertake a broad spectrum of conservation and protection activities.

1.2 Mandate of the Ministry

The Ministry of Environment and Forests is the nodal agency in the Central Government for overseeing the implementation of environmental and forestry programmes in order to protect the environment and maintain a balance between conservation and development activities.

The Ministry is also the nodal agency for the United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMOD) and the United Nations Conference on Environment and Development (UNCED). The Ministry 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) and South Asian Association for Regional Cooperation (SAARC) on matters pertaining to environment.

The broad objectives of the Ministry are:

- Conservation and survey of flora, fauna, forests and wildlife
- Prevention and control of pollution
- Afforestation and regeneration of degraded areas
- Protection of the environment
- Ensuring the welfare of animals

These objectives are well supported by a set of legislative and regulatory measures, aimed at the preservation, conservation and protection of the environment. Besides the legislative measures, the National Conservation Strategy and Policy Statement on Environment and Development, 1992; National Forest Policy, 1988; and the National Environment Policy, 2006 also guide the Ministry's work. The Ministry also serves as the nodal agency for international cooperation on matters pertaining to environment and natural resource conservation.

1.3 Key achievements in 2010-11

In the year 2010-11, a number of initiatives have been launched or given renewed impetus. Some salient initiatives are described below:

1.3.1 Climate Change

- All eight National Missions under National Action Plan on Climate Change (NAPCC) in specific areas of Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining the Himalayan Eco-system, Green India, Sustainable Agriculture and Strategic knowledge for Climate Change were approved by the Prime Minister's Council on Climate Change in May 2011 and are being implemented by the respective Nodal Ministry.
- The State Action Plan on Climate Change (SAPCC) being a mandated activity, Ministry of Environment and Forests (MoEF) requested all the State Governments to prepare SAPCC. So far, 18 States (namely, West Bengal,



- Odisha, Sikkim, Mizoram, Manipur, Meghalaya, Kerala, Andaman and Nicobar, Arunachal Pradesh, Assam, Tripura, Lakshadweep, Maharashtra, Andhra Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh and Karnataka) have prepared and submitted the draft document on SAPCC to the Ministry.
- "Climate Change and India: 4x4 Assessment- A Sectoral and Regional Assessment", under the aegis of the Indian Network for Climate Change Assessment (INCCA), has been devised to ascertain climate change impacts in 2030. This report attempts to assess observed and projected climate change for the year 2030 on four major climate sensitive regions in India namely, Himalayan region, the North-Eastern region, the Western Ghats and the Coastal Region for four key economic sectors such as the natural ecosystem and biodiversity, agriculture, water and health.
 - The Ministry has released a multi-institutional and multi-agency Science Plan titled 'National Carbonaceous Aerosols Programme' under the aegis of the INCCA to monitor aerosols and assess their impact on climate change, through various modeling techniques.
 - The Ministry has proposed to develop and implement a programme on "Long-term Ecological Observatories" under the aegis of the INCCA, which will include activities for experimental research in ecology. The broad topics of research would include climate, geology and soil science, hydrology, biodiversity, population ecology, community ecology, ecosystem and landscape-level dynamics, carbon fluxes, landuse change, and human ecology which will help in understanding ecology of fire and invasive plants, sustainable use of non-timber forest products, etc.
 - India has met the following compliance targets as per the control schedule of the Montreal Protocol:
 - Phase-out of production of CFCs with effect from 1st August 2008, 17 months prior to the Montreal Protocol schedule;
 - Complete phase-out of production and consumption of CFCs, CTC and halons with effect from 1st January, 2010.
 - The Executive Committee (Ex-Com) of the Multilateral Fund (MLF) had approved a total of 301 projects involving MLF funding of US \$257,427,713 for phase-out of production and consumption of 58,638 Ozone Depletion Potential (ODP) tonnes.
 - The Seventeenth International Day for the Preservation of the Ozone Layer was celebrated in Delhi on 16th September, 2011. The theme of this year's International Ozone Day was "HCFC phase-out - a unique opportunity". Smt. Jayanthi Natarajan, Hon'ble Minister of State for Environment & Forests (Independent Charge) was the Chief Guest. Around 650 school children, policy makers, technocrats and Government officials attended the function. A sticker, poster and India's Success Story were brought out for distribution on this occasion.
 - The 22nd Meeting of the Parties (MOP) of the Montreal Protocol held from 8th November, 2010 to 12th November, 2010 at Bangkok, congratulated India for its outstanding achievements for not seeking any CFCs for manufacturing of Metered Dose Inhalers (MDIs) under the Essential Use Nomination (EUN) provisions of the Montreal Protocol for the year 2011 and beyond.
 - The 22nd MOP of the Montreal Protocol, held from 8th to 12th November, 2010 at Bangkok, appreciated the role of Indian delegation for raising the issue of pre-blended polyols as a controlled substance and arriving at the decision to provide funding to the enterprises in A-5 Parties for conversion from pre-blended polyols with HCFC-141b to non-Ozone Depleting Substances (ODS) technologies.
 - India has been elected as a member of the Ex-Com of the MLF for the implementation of the Montreal Protocol for the year 2012.
 - An India-US Task Force on Hydrofluorocarbons (HFCs) was set up under the Co-Chairmanship of Mr. J. M. Mauskar, Special Secretary, MoEF, Govt, of India and Mr. Daniel Alan Reifsnnyder, Deputy Assistant Secretary, Department of State, USA, as a follow-up of the Indo-US workshop organized in February 2011. The Members of the Task Force were drawn from the Government, Industry and scientific community from India and USA. A draft Task Force Report has already been prepared and is under review by the two Governments.
 - A draft document of HCFC Phase-out Management Plan (HPMP) Stage-I has been prepared in consultation with the industry, industry associations and concerned line Ministries by the Ozone Cell, MoEF, in close cooperation with UNDP as the lead implementing agency and other associated agencies (UNEP, UNIDO and Bilateral Agency, Govt. of Germany). The HPMP outlines the overarching strategy and the sectoral

strategies for achieving the 2013 freeze and 2015 reduction targets as per the accelerated phase-out of HCFCs under the Montreal Protocol.

1.3.2 Green India Mission

The Government has put in place a National Mission for a Green India as part of the country's National Action Plan for Climate Change with a budget of Rs 46,000 crores (approx. USD 10 billion) over a period of 10 years. The overarching objective of the Mission is to increase forest and tree cover in 5 million ha (m ha.) and improve the quality of forest cover in another 5 m ha. Thus, the Mission will help in improving ecosystem services in 10 million ha. of land, and increase the flow of forest based livelihood services to, and income of, about 3 million forest dependent households.

1.3.3 Mission Clean Ganga

1. A Memorandum of Agreement (MoA) was signed on 6th July, 2010 by the Ministry of Environment & Forests (MoEF) with a consortium of seven IITs (Kanpur, Delhi, Chennai, Mumbai, Kharagpur, Guwahati & Roorkee) for the development of Ganga River Basin Management Plan (GRBMP). The Plan will outline comprehensive measures for restoration of the Ganga, with due regard to the issue of competing water uses in the river basin.
2. To bridge the vital deficit in sewage infrastructure capacity and other related activities for river conservation in towns along the River Ganga, the first phase of projects (worth Rs. 1450 crores) has been approved for development of sewer networks, sewage treatment plants and sewage pumping stations, electric crematoria, community toilets, development of river fronts, resuscitation of canals, and public campaigns.
3. The existing National River Conservation Plan (NRCP) funding pattern, i.e. 70:30 between the Centre and States, is being followed for these National Ganga River Basin Authority (NGRBA) projects. The Planning Commission has been requested to agree to the proposal of sharing the O&M costs of the assets created under NGBRA by the Central and State Governments on a 70:30 basis for five years, with the review at the end of two years. The States are expected to build the technical and financial capacity of ULBs to ensure O&M on a sustainable basis.
4. In addition to these measures, the Ministry is negotiating a major loan of about US\$ 1 billion with the

World Bank for Ganga cleaning, which is progressing on track.

5. To effectively tackle the problem of industrial pollution, a dedicated cell has been set up in CPCB for inspection and monitoring of industrial units discharging effluents into the river Ganga.

1.3.4 Coastal Regulation Zone

1. The Ministry has initiated the World Bank assisted Integrated Coastal Zone Management (ICZM) with an overall cost of Rs. 1155.63 crores in which the World Bank will contribute an amount of Rs. 897 crores (77.7%), Ministry Rs. 177.49 crores (15.5%) and the States Rs. 80.02 crores (6.9%). To implement the above project, Society of Integrated Coastal Management (SICOM) has been established as a registered body on 15th September, 2010. This Society will be implementing the above ICZM projects which have four major components namely, National Coastal Management Programme, and three ICZM projects in three States namely, Gujarat, Odisha and West Bengal.
2. Under the National component, the demarcation of the hazard line has been assigned to Survey of India for mapping the entire coastline of the mainland coast of the country, based on tides, waves, sea level rise and shoreline changes. In order to build a capacity in the country in the area of coastal management, a National Centre for Sustainable Coastal Management has been set up within Anna University, Chennai.
3. Two major initiatives have been undertaken by SICOM which include implementing an Integrated Coastal Zone Management Project at Dandi and surrounding villages and at Vedaranyam, keeping in view the historical importance of the *salt satyagraha* undertaken in these two villages by Mahatma Gandhi and Shri Rajaji, respectively.
4. With regard to the Integrated Coastal Zone Management projects in the State, the ICZM project is being implemented at Gulf of Kachchh in Gujarat (298 crores), Paradip-Dhamra and Gopalpur-Chilka stretch in Odisha (202 crores) and Digha-Shankarpur and Sagar islands in West Bengal (300 crores). The State components address the issues relating to coastal management, including improving livelihood of the local communities, disaster mitigation and promoting sustainable alternative livelihoods.
5. The Ministry had issued the draft Island Protection

Zone (IPZ) Notification on 25th February, 2010 and the Draft Coastal Regulation Zone Notification, 2010 on 15th September, 2010. After a series of discussions with the stakeholders, prior to issuing of the above Draft Notifications and holding consultations with fishermen associations, the above two Notifications have been finalized and issued on 6th January, 2011 as Coastal Regulation Zone Notification, 2011 and IPZ Notification, 2011. These two Notifications superseded the CRZ Notification, 1991.

1.3.5 Initiatives for the Rights of Forest Dwellers

The Ministry of Environment and Forests and the Ministry of Tribal Affairs constituted a Joint Committee in April 2010 to comprehensively review the implementation of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The Committee members were selected from a wide spectrum of stakeholders consisting of retired civil servants, forest officers, tribal department officers and representatives of Civil Society Organizations and NGOs. The Committee has submitted its final report and findings and the report is available on the Ministry's website.

1.3.6 Pollution Control

1. For control of air pollution, with a view to initiate policy measures and to prepare ambient air quality management plans, 446 ambient air quality monitoring stations are operational, covering 182 cities/towns, industrial areas in 26 States and five Union Territories. Presently, only the criteria pollutants, namely: sulphur dioxide (SO₂), nitrogen dioxides (NO_x) and fine particulate matter (PM₁₀) are monitored under National Ambient Air Monitoring Programme (NAAMP) by the Pollution Control Boards, Pollution Control Committees, Universities and Research Institutes. Besides, additional parameters for other toxic trace matters and polycyclic aromatic hydrocarbons are also being monitored in selected cities of the country. The continuous monitoring has been introduced in twenty seven cities namely, Agra, Ahmedabad, Bangaluru, Chandrapur, Chennai, Cuddalore, Delhi, Durgapur, Faridabad, Ghaziabad, Haldia, Howrah, Hyderabad, Jaipur, Jharia, Jodhpur, Kanpur, Kolkata, Lucknow, Mumbai, Panipat, Patna, Pune, Solapur, Tuticorin, Vadodara and Varanasi. A total of 81 manual monitoring stations have been added in the network under NAMP during 2010-11.

2. The Government has published a Notification on the Revised National Ambient Air Quality Standards, 2009 (NAAQS-2009) in the official Gazette on 16th November, 2009. These ambient air quality standards/ limits provide a legal framework for the control of air pollution and the protection of public health. In furtherance of these Standards, the CPCB is in the process of creating a roadmap for the generation, maintenance and monitoring of required infrastructure and for the development of protocols.
3. The monitored ambient air quality data during the year, while comparing with revised NAAQS-2009, indicates that the annual average levels of Sulphur Dioxide (SO₂) are within the prescribed air quality norms across the country and that of Nitrogen Dioxide (NO₂) are within the norms in most of the cities. However, the levels of fine particulate matter (PM₁₀) exceed the prescribed norms in many cities including Delhi. PM₁₀ and NO₂ are the emerging air pollutants.
4. 'National Ambient Noise Standards are in place in the Noise Pollution (Regulation and Control) Rules, 2000. The Noise Rules have been recently amended so as to make the 'night' (2200 hrs - 0600 hrs) quieter in residential areas and silence zones. National Ambient Noise Monitoring Network has been established with five stations in each of the seven cities, namely, Delhi, Lucknow, Bengaluru, Kolkata, Chennai, Hyderabad and Mumbai. The ambient noise levels are being monitored on a 24 X 7 basis.
5. A Centrally Sponsored Scheme has been undertaken by the Government for enabling the small scale industries (SSIs) to set up new and upgrade the existing Common Effluent Treatment Plants (CETP) to cover all the States in the country.
6. The Ministry of Environment & Forests (MoEF) has adopted a Comprehensive Environmental Pollution Index (CEPI) system of environmental assessment of the Industrial Clusters, evolved by the Central Pollution Control Board in collaboration with IIT, Delhi. For the first time, Comprehensive environmental assessment has been done by CPCB & Ministry for the 88 prominent Industrial clusters of the country on the basis of Comprehensive Environmental Pollution Index (CEPI) number. The present CEPI system is intended to be used as an early warning tool for categorizing industrial clusters/areas in terms of the severity of the overall pollution levels

7. The Ministry has notified the new Draft Bio-Medical Waste (Management & Handling) Rules, 2011 under the Environment (Protection) Act, 1986 to replace the earlier Rules (1998) and the amendments thereof.

1.3.7 Issues of Genetically Modified Food Crops

Genetic engineering (modern biotechnology) promises remarkable advances in medicine, agriculture, and other fields. However, being a relatively new field, much about the interaction of Genetically Modified Organisms (GMOs) with both biotic and abiotic environment is yet to be known. This raises apprehensions about the new technology, which includes its potential adverse effects on biological diversity and risks to human health. Government of India is one of the early movers in acknowledging these risks and addressing it through a robust legal framework. Genetically modified organisms (GMOs) and products thereof, including GM crops, are regulated in India by the 'Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/ Genetically Engineered Organisms or Cells, 1989 notified under the Environment (Protection) Act', 1986. These rules and regulations, commonly referred as Rules 1989, cover areas of research as well as large scale applications of GMOs and their products. These rules and regulations are implemented by Ministry of Environment and Forests (MoEF), Department of Biotechnology (DBT) and State Governments through various committees.

1.3.8 Biosafety

The Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety (CPB) was adopted in October 2010 at Nagoya after six years of intense negotiations. The Supplementary Protocol fulfils the commitment set forth in Article 27 of the CPB to elaborate international rules and procedures on liability and redressal for damage to biodiversity, resulting from trans-boundary movements of LMOs. The Protocol has been opened for signature at the United Nations Headquarters in New York from 7th March, 2011 to 6th March 2012. As of date, 36 countries are signatories to the Supplementary Protocol. The Protocol will enter into force on the 19th day after the date of deposit of the 40th instrument of ratification, acceptance, approval or accession. India has signed the supplementary Protocol on October 11, 2011.

1.3.9 Renewed Impetus to Science

1. The Ministry of Environment & Forests announced a series of measures to strengthen the scientific base underlying the activities of the Ministry, including a Global Advisory Network Group on Environmental Sciences (GANGES), a National Environmental Sciences Fellows Programme, an Expert Committee to Enhance the Scientific Capacity and an Action Plan to Enhance Forestry Science.
2. Indian Network for Climate Change Assessment (INCCA), established by the Ministry in October 2009, is a network-based programme to make science, particularly the "3 Ms" - Measuring, Modeling and Monitoring - the essence of our policy-making in the climate change space. It brings together over 120 institutions and over 220 scientists from across the country.

1.3.10 Western Ghats

1. The Western Ghats Ecology Expert panel (WGEEP) under the Chairmanship of Prof Madhav Gadgil has been constituted by the Ministry with the main objectives of identification and management of ecologically sensitive areas in the Western Ghats and to recommend measures for conservation, protection and rejuvenation of the Western Ghats region following a comprehensive consultation process with the people and the Government.
2. A web site www.westernghatsindia.org has been developed by the Panel, which serves as a medium of exchange and repository of information on ecology of Western Ghats region.
3. The Eastern and Western Ghats Research Programme addresses itself to location-specific problems of resource management in the Eastern and Western Ghats regions of the country. The region is suffering from destruction of habitats of its unique plant and animal life due to floods, deforestation, etc., besides shortage of food, fodder and fuel for the rural population and shortage of raw material for the industries. Under this programme, studies relating to Bio-diversity, land use, impact of developmental activities etc. are taken up to restore the environmental quality of the region. During the year, under Eastern and Western Ghats Research Programme, one new project was initiated, 14 studies were completed and 21 projects were reviewed and monitored for their progress.

1.3.11 Himalayas

Considering the fragility and importance of the Himalayas, a National Mission for Sustaining the Himalayan Ecosystem (NMSHE) has been included in the eight National Missions of the National Action Plan on Climate Change (NAPCC) with the objective of conserving and protecting Himalayan glaciers and its ecosystem. It is the only area-specific Mission. Its specific action area is to improve trans-boundary exchange of information through mutually agreed mechanisms and ICIMOD (being an independent 'Mountain Learning and Knowledge Centre') can play an important role in strengthening such trans-boundary exchange of information among the eight regional member countries of the Hindu Kush Himalayas area.

1.3.12 Sundarbans

India has a large grant project in the Sundarbans Mangroves with the West Bengal Forest Department for 300,000 USD. The project is under formalization and the focus of the project is the reduction in anthropogenic pressures on the mangrove forest resources through the provision of alternative livelihoods and income generating options and it seeks to pilot disaster preparedness initiative and reduce the risk of damage to lives and livelihoods from flooding and other related natural disasters that the area is prone to. Institutional building/strengthening is also a key component of the project.

1.3.13 Transparency in Environmental and Forestry Clearances

The Ministry has initiated a proposal to establish a National Environment Assessment and Monitoring Authority (NEAMA) to strengthen the regulatory framework and to improve the environmental governance in the country, particularly in the fields of environment impact assessment and coastal zone management. The earlier National Environment Protection Authority (NEPA) has been rechristened as NEAMA in line with its proposed mandate. A concept note on NEPA was uploaded on the Ministry's website on 25th May, 2010 for suggestions and as a part of the consultation process. A meeting was held in May, 2010 in New Delhi in which representatives of State Governments, State Pollution Control Boards/Pollution Control Committees, Central Pollution Control Board and line Ministries participated. A project titled 'Scope, Structure and Process of NEAMA' was awarded by MoEF to Indian Institute of Technology (IIT), Delhi and the draft study

report has been uploaded on the Ministry's website on 26th November, 2010 for comments. NEAMA is a part of the larger environmental regulatory reform agenda of the Ministry.

1.3.14 Website

1. As part of a continuous and ongoing process to bring more transparency and citizen-friendliness into its functioning and to become a more accountable and transparent Ministry, a new website was launched with a brand new interface on 29th September 2009. ENVIS Focal Point in the Ministry is responsible for maintenance and updation of the website of the Ministry (*URL: <http://www.moef.gov.in>*). Ministry's website has been revamped with better look, content and design, adopting latest technologies.
2. The website has been linked with the various Divisions of the Ministry in order to have up-to-date information on the subject concerned. Besides, the website is also regularly providing information on the new updates of the Ministry, response to media reports and other important issues of the Ministry from time to time with the objective of disseminating such information to all concerned.
3. In the spirit of ensuring greater transparency, the National Afforestation & Eco-Development Board (NAEB) has launched an enhanced website (*www.naeb.nic.in*) which provides information on all schemes and programmes of NAEB, guidelines, status of proposals, sanctions and evaluations.

1.3.15 Biodiversity

1. India is a party to the Convention on Biological Diversity (CBD), which was adopted during the Rio Earth Summit in 1992. Ministry is hosting the CoP-11 to the CBD in Hyderabad on 1-19 October, 2012. CoP-11 is expected to be the largest such conference to be held in the country, with participation of thousands of delegates from all countries of the world, including Heads of State/Governments, Ministers/Vice-Ministers, senior Government officials, heads and senior officers of UN and multilateral agencies, private sector, academia, civil society organizations etc. The event provides India with an opportunity to consolidate, scale-up and showcase our initiatives and strengths on biodiversity. India with a strong institutional, legal and policy framework, has the potential and capability to emerge

as the world leader in conservation and sustainable use of biodiversity, and also to set the global agenda on biodiversity in the context of sustainable livelihoods during the UN Decade on Biodiversity 2011-2020.

2. The Ministry has initiated a major new programme to value the immense wealth of natural resources and biodiversity in India. Collaborating with The Economics of Ecosystems and Biodiversity (TEEB) study, the Ministry has begun the process of valuating its natural capital and ecosystem services in terms of economic value.

1.3.16 Wildlife

1. The final draft of the Wild Life (Protection) Amendment Bill 2010 has been prepared, taking into consideration the numerous suggestions received from various stakeholders. This draft is now proposed to be put before the National Board of Wildlife for their consideration once it is reconstituted.
2. The National Tiger Conservation Authority (NTCA) has been strengthened / decentralized with three Regional Offices; AIGs posted at Nagpur and Bengaluru Regional Offices. Process is underway for posting IGFs in the three Regional Offices, besides an AIG at Guwahati.
3. The Project Tiger coverage has expanded with 40 tiger reserves spread out in 17 States with the core areas amounting to almost 1% of the country's geographical area. The final approval has been accorded by the NTCA for creation of a new Tiger Reserve (namely, Kawal) in Andhra Pradesh. In principle, approval has been accorded by the NTCA for the following five tiger reserves: i) Pilibhit (Uttar Pradesh), ii) Ratapani (Madhya Pradesh), iii) Sunabeda (Odisha), iv) Mukundara Hills (including Darrah, Jawahar Sagar and Chambal Wildlife Sanctuaries) (Rajasthan), v) and Kudremukh (Karnataka).
4. States have been advised to send proposals for declaring the following areas as Tiger Reserves:
 - i) Bor (Maharashtra),
 - ii) Suhelwa (Uttar Pradesh),
 - iii) Nagzira-Navegaon (Maharashtra)
 - iv) Satyamangalam (Tamil Nadu),
 - v) Guru Ghasidas National Park (Chhattisgarh),
 - vi) Mhadei Sanctuary (Goa) and
 - vii) Srivilliputhur Grizzled Giant Squirrel / Megamalai

Wildlife Sanctuaries / Varushanadu Valley (Tamil Nadu).

5. Detailed revised guidelines have been issued for the implementation of Project Tiger and relocation of villages vis-a-vis the provisions of the Wildlife (Protection) Act, 1972 and the Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006.
6. The second round of country level assessment (2010) relating to status of tigers, co-predators and their prey was released on 28th July, 2011. This is a sequel to the preliminary findings released in March this year. This study reports a countrywide increase of 20% in tiger numbers in 2010 with an estimated number of 1706 (1520-1909) tigers. The 2006 estimation was 1411 (1165-1657) tigers. The second round of independent assessment based on refined criteria was done in 2010-11 for 39 tiger reserves. This assessment is based on the globally used framework, as adapted to Indian conditions. Five independent teams conducted the evaluation using 30 indicators. The framework consists of six elements: context, planning, inputs, process, outputs and outcomes. The 39 tiger reserves were grouped in same landscape clusters as done in tiger estimation. An additional category comprising of tigers in 'red corridor' has been included, besides a separate category for reserves where tigers have gone locally extinct. Out of 39 tiger reserves, 15 were rated as 'very good', 12 as 'good', 8 as 'satisfactory' and 4 as 'poor'. In all, 28 tiger reserves were compared with the MEE ratings of 2005-06. It is inferred that the 'very good' category increased by 4%, 'good' category increased by 3% and 'satisfactory' decreased by seven per cent.
7. Approval of the CCEA was obtained for an upward revision of the cost estimates for the ongoing Centrally Sponsored Scheme of Project Tiger during the XIth Plan period from Rs.650 crores to Rs.1216.86 crores of central assistance. The upward revision has been necessitated due to the increased action for relocation of villages from the notified core/critical tiger habitats of tiger reserves, besides inclusion of additional components.
8. The Central Zoo Authority (CZA) is a statutory body of Ministry of Environment and Forests, Government of India, constituted in 1992 under the Wild Life (Protection), Act, 1972 to provide technical and other assistance to zoos in India. The CZA is in the process of finalizing the following guidelines for better management of zoos in India:

- *Protocol on transportation of wild animals:* This document will guide zoos regarding transportation of wild animals from one zoo to other and what arrangement to be made before and during the transportation of animals. The details on manpower, vehicle, and cage requirement, anesthesia to the animals, age and sex of animals, veterinary care of animals, and necessary permission is given in the document.
- *Guidelines for Developing Framework Mechanism for Mobilizing Corporate Financial Support for Supplementing Management of Zoos:* This document would guide the zoos on developing framework mechanism for mobilizing corporate financial support for supplementing management of zoos. It has details on ways of fund raising for zoos, activities that can be followed under fund raising scheme, constitution of charitable societies by zoos to plough back the revenue earned by the zoos and how one can market its zoo for the purpose of increasing revenue and fund raising etc.
- *Guidelines for the Utilization of Volunteers in Zoo Management in India:* This document would guide the zoos to prepare them for utilizing services of a volunteer for better management of zoos in India. This document reflects the details on the activities and fields where a zoo can employ the volunteer, nature of jobs, stipend and honorarium including certificates, volunteer ethics, disclaimer on risk and injury to volunteer, and assumption of risk, selection/ re-engagement criteria.
- *Guidelines on Minimum Dimension of Enclosures for Housing Exotic Animals of Different Species:* The Central Zoo Authority has framed guidelines on minimum dimension on housing for the animals listed in the schedule 1 and 2 of the Wild Life (Protection) Act, 1972 but did not have the guidelines for the exotic animals such as giraffe, hippo, zebra, etc. This document gives minimum dimension of enclosure for housing of exotic animals being kept in zoos in India.

1.3.17 National Green Tribunal

The National Green Tribunal (NGT) has been established under the National Green Tribunal Act, 2010 on 18th October, 2010 for the effective and expeditious disposal of

cases related 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. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multidisciplinary issues. The Tribunal's dedicated jurisdiction in environmental matters shall provide speedy justice and help reduce the burden of litigation in the higher Courts. The Tribunal is mandated to make an endeavour for final disposal of applications and appeals within six months of filing of the same. Five places of sitting have been notified for NGT. New Delhi is the Principal place for sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai are the other places for sitting of the Tribunal. It will also follow circuit procedure for making itself more accessible. The Tribunal has commenced its hearings from July, 2011.

1.4 Goals for the Next Year (2011-12)

The key policy initiatives and other important measures planned for the next year (2011-12) include the following:

1. Preparing State Action Plans on Climate Change (SAPCC) consistent with the strategy outlined in the National Action Plan on Climate Change (NAPCC).
2. Ensure implementation of hazardous wastes (Management Handling and Transboundary Movement) Rules, 2008 and Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (amended 2000).
3. Implementation and monitoring of standards, setting up of network of water, air and noise monitoring stations, identification of critically polluted areas and pollutants, preparation of plans, programmes, scientific inventorization, studies and projects.
4. Series of programmes to protect biodiversity in the International Year of Biodiversity (2010). As a mark of its commitment to biodiversity conservation, India will also host the Eleventh Conference of Parties to the Convention on Biodiversity in October 2012.
5. Conservation activities for rivers on a river basin approach. Prioritizing and implementing action for tackling pollution in major towns of Ganga. Adoption of new sewage treatment technology.
6. Strengthening of integrated development of wildlife habitats and providing adequate funds and training to forest personnel.

7. Setting up a National Centre for Climate Change Research that would serve as an arm of the Climate Change Division of the Ministry and provide advisory and technical support services in the areas of Climate Change Modeling, NATCOM, Negotiations and other technical works.
8. Setting up 'Environmental Information System' with CPCB for continuous water and air pollution monitoring on GIS platform.
9. Provide financial and technical assistance to 365 PAs in states/UTs, to undertake 5 recovery programmes for critically endangered species and for management of 10 conservation and community reserves.
10. Creation of database for clean technologies available in India and abroad.
11. Launch of project on assessment of "black carbon" and its impact on environment in consultation with other agencies of the Government.
12. The Intensification of Forest Protection Scheme, aiming at strengthening of forest infrastructure with increased effectiveness in control of forest fires, illicit felling, encroachments, scientific management of forests and involvement of local communities in protection of forests.

State of the Environment

2.1 Introduction

The main objective of the State of Environment reporting is to depict the trends and state of the environment and act as the basis for guidelines and strategies for our national environmental action planning. This chapter also provides an insight on various priority issues for India related to the current status of environment and natural resources, the pressures behind environmental changes, and highlights the issues and challenges along with measures undertaken by the Ministry to address these issues and their associated impacts.

The present chapter focuses on the current state of environment, pertaining to major environmental areas like air pollution, water pollution, solid waste management, forestry, biodiversity, wildlife, coastal resource management, climate change, and environmental education & awareness.

2.2 Air Environment

Air pollution and the resultant impacts in India could be broadly attributed to the emissions from vehicular, industrial and domestic activities. India's increasing population, coupled with rapid urbanization and industrialization has placed significant pressure on its infrastructure and natural resources. Apart from the outdoor air pollution in cities due to vehicular exhausts and industrial emissions, maximum rural households suffer from indoor air-pollution stemming from burning of fuel-wood, dung cakes and crop residues in their traditional cook stoves for meeting their cooking and energy needs.

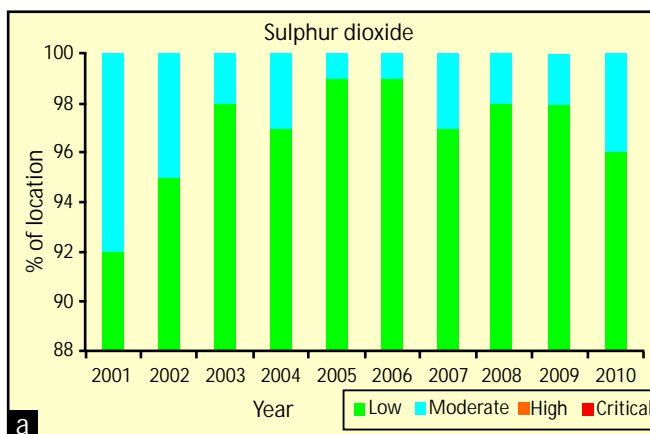
2.2.1 Ambient Air Quality

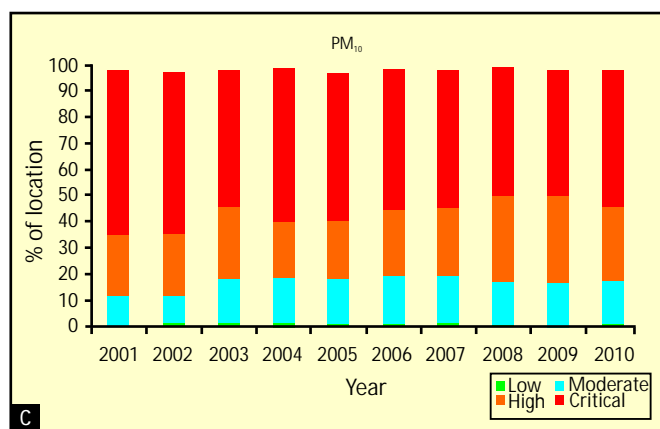
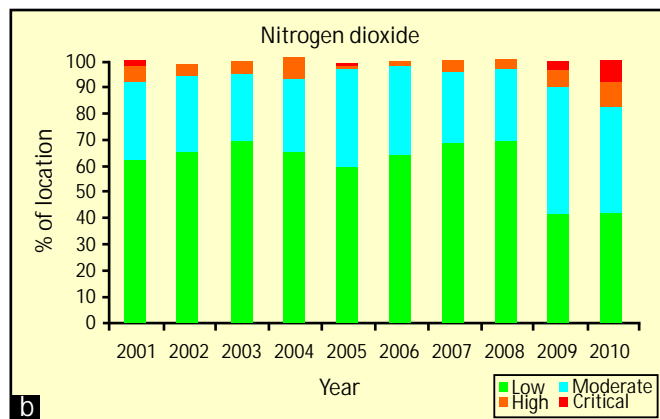
The norms for ambient air quality have been revisited and various industry-specific emissions standards are evolved afresh or revisited and notified from time to time. For control of air pollution, with a view to initiate policy measures and to prepare ambient air quality management plans, 456 ambient air quality monitoring stations are operational covering 190 cities / towns, industrial areas in 26 States and five Union Territories. Presently, only the

criteria pollutants namely, Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and particulate matter (PM₁₀) are monitored under National Ambient Air Monitoring Programme (NAAMP) by the Pollution Control Boards, Pollution Control Committees, Universities and Research Institutes. Besides, additional parameters for other toxic trace matters and Polycyclic Aromatic Hydrocarbons (PAHs) are also being monitored in selected cities of the country. Continuous monitoring has been introduced in 27 cities. Apart from these, a total of 91 manual monitoring stations have been added to the network under NAAMP during 2010-11.

Trend in percentage of locations (Residential areas till 2009 and residential/industrial/rural/others for 2010, adequate data) with low, moderate, high and critical levels of SO₂, NO₂, PM₁₀ is depicted in Figure below. With respect to SO₂, percentage of locations are limited to low and moderate category though fluctuating over the years. This indicates a low SO₂ pollution level (Figure a). NO₂ levels showed a reduction in the low category and an increase in moderate, high and critical level indicating an increase in the pollution level (Figure b). Location with respect to PM₁₀ showed similar trend in 2010 with a reduction in the low category (Figure c)

Figure: Yearly Trends of Low, Moderate, High and Critical levels of a. SO₂, b. NO₂ and c. PM₁₀ (Residential areas; percentage of location)





Source: CPCB, 2011

2.2.2 Indoor Air Pollution

In India, the household sector is the second largest energy consumer, after the industrial sector. More than 70 percent of Indian households use solid fuels and around 90 percent of the rural households do the same. In fact, 60 percent of Indian households depend on traditional biomass fuels for cooking and heating. Burning of traditional fuels like dung cakes and firewood gives out a huge amount of Carbon Dioxide when the combustion is complete, but if there is an incomplete combustion followed by oxidation then Carbon Monoxide is produced, along with hydrocarbons, which is hazardous to human health.

The Ministry has published a notification on the Revised National Ambient Air Quality Standards, 2009 (NAAQS-2009). These ambient air quality standards provide a legal framework for controlling air pollution and protecting public health. The CPCB is also in the process of creating a roadmap for the generation, maintenance and monitoring of required infrastructure and for the development of protocols.

2.2.3 Impacts and Key Issues

Polluted air can impact both human health and the ecosystem. This results in higher levels of respiratory symptoms and reduced lung function. High levels of ozone can cause serious damage to the crops which includes foliar injury, accelerated ageing, decreased plant growth, altered plant metabolism, and reduced crop yield. In humans, it causes Induction of respiratory symptoms, decrements in lung function, Inflammation of airways. Air pollutants can also cause considerable visibility reduction and aesthetic damage.

2.2.4 Policy and Legal Measures

Central Pollution Control Board is executing a nation-wide National Air Quality Monitoring Programme (NAQMP). The monitoring under the NAQMP is being carried out with the help of Central Pollution Control Board; Zonal Offices; State Pollution Control Boards; Pollution Control committees and National Environmental Engineering Research Institute (NEERI), Nagpur. The trend in annual average concentration in SO₂ levels in various cities shows a decreasing trend in Delhi, Kolkata, Mumbai, Chennai etc., during the last five years. The decreasing trend in Sulphur Dioxide levels may be due to various measures taken such as reduction of sulphur in diesel, use of LPG instead of coal as domestic fuel, conversion of diesel vehicles to CNG, etc. The annual average concentration in NO₂ levels in various Metropolitan cities has been found to be within the national standards. Various measures such as implementation of Bharat Stage-III norms have been taken to mitigate ambient NO₂ build-up.

The issue of noise has been a matter of concern in urban environment. A bilingual booklet has been brought out on Noise Pollution (Regulation and Control) Rules, 2000 by incorporating all amendments in Noise Rules for creating mass awareness. Monitoring of ambient noise has been started during the year in seven metro cities.

2.3 Water Environment

Increasing population, urbanization and growing demand of water for agriculture, industry, drinking water and hydroelectricity have severely impacted the water quality of rivers. CPCB has identified 150 polluted river stretches in the country based on analysis of water quality data over 2002 to 2008. Presently, there is a huge capacity deficit in the sewerage network and sewage treatment infrastructure. Against sewage generation of over 38,000

million litres per day (MLD) in the Class-I and Class-II towns, treatment capacity of only about 12,000 mld exists.

2.3.1 Impacts and Key Issues

Most human activities, whether domestic, agricultural or industrial, have an impact on water and the ecosystems. Water borne diseases can be, to a large extent, controlled by managing human consumption and production patterns. It is therefore pertinent to have an understanding of human activities, including water management initiatives, and their impacts on water and the environment.

2.3.2 Conservation of Rivers

The river cleaning programme in the country has initiated with the launching of the Ganga Action Plan (GAP) in 1985. The Ganga Action Plan was expanded to cover other rivers under National River Conservation Plan (NRCP) in the year 1995. NRCP presently covers polluted stretches of 39 rivers in 190 towns spread over 20 States at a sanctioned cost of Rs.7639 crores. The pollution abatement works are implemented on a cost sharing basis between the Centre and State Governments. The works include collection, transportation and treatment of municipal sewage, River Front Development (RFD), Low Cost Sanitation (LCS), Electric Crematoria, Improved Wood Based Crematoria, etc. So far, sewage treatment capacity of 4417 million litres per day has been created under the Plan. Prevention and control of industrial pollution is being addressed by the Central and State Pollution Control Boards/Pollution Control Committee.

2.3.3 Water Quality Monitoring of Rivers

National Water Quality Monitoring Programme comprises of 1700 stations, spread over 27 States and six Union Territories. The monitoring network covers 353 rivers, 107 lakes, nine tanks, 44 ponds, 15 creeks/seawater, 14 canals, 18 drains and 490 wells. Out of 1700 stations, 980 are on rivers, 117 on lakes, 18 on drains, 27 on canals, nine on tanks, 15 on creeks/seawater, 44 on ponds and 490 are groundwater stations. Bio-monitoring is also carried out on specific locations. In view of manpower and resource constraints, organic pollution related parameters are chosen for frequent monitoring i.e. monthly or quarterly while major cations, anions, other inorganic ions and micro pollutants (toxic metals & PoPs) are analyzed once in a year to keep track of water quality over a large period of time.

2.3.4 Policy and Legal Measures

The Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) monitor compliance of effluent discharge standards by the industries. CPCB has identified Grossly Polluting Industries which are discharging BOD load of 100 kg per day or more in the Ganga Basin. Action is being taken against the defaulting industries by CPCB and SPCBs under relevant provisions of Water (Prevention & Control of Pollution) Act, 1974 and Environment (Protection) Act, 1986.

2.3.4.1 National River Conservation Plan

The National River Conservation Directorate (NRCD), functioning under the Ministry of Environment and Forests is engaged in implementing the River and Lake Action Plans under the National River Conservation Plan (NRCP) and National Lake Conservation Plan (NLCP) by providing financial assistance to the State Governments. The objective of NRCP is to improve the water quality of the rivers, which are the major water sources in the country, through the implementation of pollution abatement works, to the level of designated best use. At present, the National River Conservation Plan (NRCP) includes works in 190 towns along polluted stretches of 39 rivers spread over 20 states. The rivers are:

S. No	River	S. No	River	S. No	River
1	Adyar	14	Gomati	27	Rani Chu
2	Beas	15	Khan	28	Sabarmati
3	Betwa	16	Krishna	29	Satluj
4	Beehar	17	Kshipra	30	Subarnarekha
5	Bhadra	18	Mahanadi	31	Tapti
6	Brahmani	19	Mandovi	32	Tapi
7	Cauvery	20	Mandakini	33	Tunga
8	Cooum	21	Mahananda	34	Tungabadra
9	Chambal	22	Musi	35	Tamrabarani
10	Damodar	23	Narmada	36	Vaigai
11	Dhipu & Dhansiri	24	Pennar	37	Vennar
12	Ganga	25	Pamba	38	Wainganga
13	Godavari	26	Panchganga	39	Yamuna

The pollution abatement works taken up so far under the NRCP include:

- Interception and diversion works to capture the raw

sewage flowing into the river through open drains and divert them for treatment.

- Setting up Sewage Treatment Plants for treating the diverted sewage.
- Construction of Low Cost Sanitation toilets to prevent open defecation on river banks.
- Construction of Electric crematoria and Improved Wood Crematoria to conserve the use of wood.
- River Front Development works such as improvement of bathing ghats.
- Afforestation on the river banks, Public Participation & Awareness etc.

2.3.4.2 National Lake Conservation Plan

The Ministry is implementing the scheme of National Lake Conservation Plan (NLCP) since June, 2001 for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the country where degradation is primarily on account of discharge of waste water into the lake, through an integrated ecosystem approach. The mandate of the NLCP Scheme is pollution prevention and conservation of perennial lakes. So far under NLCP, a total of 41 projects for conservation of 61 lakes have been sanctioned in 14 States at a sanctioned cost of Rs. 1028.19 crores. Conservation works for 18 lakes have been completed so far, whereas in some cases the project implementation is in last stages of completion. Funding pattern under NLCP is on a 70:30 cost sharing between the Central and State Government.

2.3.4.3 National Wetland Conservation Programme

Central Government notified the Wetlands (Conservation and Management) Rules - 2010 vide notification no. GSR-951(E) dated 4th December, 2010. As per the provision under Rule 5 of these wetlands rules, Central Wetlands Regulatory Authority (CWRA) has been constituted under the chairmanship of Secretary (E&F). An Expert Group on Wetlands (EGOW) has also been set up for examining management action plans of newly identified wetland and also identification of new wetlands for the conservation and management.

2.3.5 Recent Initiatives

The revised guidelines on Common Effluent Treatment Plant (CETP) have been approved by the Ministry and the Planning Commission. The salient features of the revised CETP guidelines are as follows:

- (i) Central subsidy is proposed to be enhanced.
- (ii) All the three levels of treatment: Primary, Secondary and Tertiary are to be covered for assistance. Progressive technologies like Zero Liquid Discharge and Membrane Filtration will also be considered for assistance, subject to the ceiling.
- (iii) The management of the CETP is to be entrusted to a Special Purpose Vehicle registered under an appropriate statute.
- (iv) Performance guarantee at full design load is to be ensured upfront.

The Planning Commission in a meeting held on 18.11.2010 has agreed to enhance the Central subsidy from 25 % to 50%, subject to a ceiling of Rs. 20 crores per CETP in order to make the scheme of CETPs practical and in tune with the ground realities. The Memorandum for the revised scheme of CETPs has been prepared and sent for the comments of all the concerned Ministries / Departments.

2.4 Solid Waste Management

The problem of solid waste management has also got exacerbated over the years, due to changing life styles, increasing consumerism, rapid urbanization and economic growth. There is a critical deficiency in most cities in terms of waste collection, processing and disposal facilities. Management of plastic bags and PET bottles is a formidable challenge. Waste streams are becoming increasingly complex, requiring specialized treatment. According to recent estimates 6.23 million tonnes of hazardous industrial waste is being generated annually in the country against which the treatment capacity is only about 35%. Health care facilities need to be equipped for segregation of bio-medical waste and treatment and incineration of infectious components in dedicated facilities.

Municipal Solid Waste

The Ministry has reviewed the prescribed limits for non-paper recyclable material in waste paper consignments being imported from other countries. The revised guidelines and specifications for non-recyclable material in waste paper consignment have been notified. Financial assistance has been provided to various State Pollution Control Boards for organizing training workshops and public awareness on management of municipal solid waste.

Biomedical Waste

For treatment and disposal of Biomedical waste (BMW)

generated in the country, there are 177 common treatment and disposal facilities in operation which were developed by the private entrepreneurs. These are in addition to the 11,921 captive treatment and disposal facilities developed within health care facilities (HCFs). For effective management of bio-medical waste generated from Health Care Facilities (HCFs), Government of India promulgated Biomedical Waste (Management & Handling) Rules in July 1998 (hereafter referred as BMW Rules) under the Environment (Protection) Act, 1986.

E-waste

The tremendous growth and technological advancements in the electronic data management and communications have spurred economic growth and improved living standards. However, the dependence on electronic products has given rise to a new area of concern i.e. electronic waste. The high rates of obsolescence of products in use in the domestic sector such as TVs, refrigerators, washing machines and mobile phones as well as computers give rise to substantial E-waste generation and this is going up steadily, given the high growth rates in these segments. Based on a survey carried out by CPCB, it was estimated that 1,46,800 tonnes of E-waste was generated in the country in the year 2005. It has been estimated that the quantity of E-waste (washing machine, refrigerators, computers, mobile phones and TV) will increase to 8,00,000 tonnes by 2012. It was also found that sixty-five cities in India generate more than 60% of the total E-waste generated in India. Ten states generate 70% of the total e-waste generated in India. E-waste contains materials that are both toxic and valuable such as lead, cadmium, mercury, polychlorinated bi-phenyls (PCBs), etched chemicals, brominated flame retardants (BFR), arsenic, asbestos and nickel etc. and also recoverable materials such as plastics, iron, glass, aluminum, copper and precious metals such as silver, gold, platinum, and palladium, etc.

2.4.1 Impacts and Key Issues

E-waste, if not handled in an environmentally sound manner poses risk to human health and environment. Illegal processing of E-waste is being carried out in some places of the country where the E-waste is burnt openly for recovery of metals. *Brominated flame retardants (BFR)*, can give rise to dioxins and furans during incineration. Arsenic or asbestos may act as a catalyst to increase the formation of dioxins during incineration. The dioxins are carcinogenic in nature.

2.4.2 Policy and Legal Measures

In September 2008, Hazardous Waste (Management, Handling and Transboundary Movement) [MW (MH2TM)] Rules 2008 were notified and E-waste was included in Schedule IV of the rules at serial number 18. By inclusion in schedule IV means any person or unit desirous of recycling of E-waste has to obtain registration from concerned SPCBs/PCCs. The registration is granted by SPCBs/PCCs only after ensuring that the unit has environmentally sound recycling facilities. This inclusion of E-waste under the schedule IV of the [MW (MH2TM)] Rules, 2008 also ensures that handling of E-waste has to be done by the registered recyclers only. As an outcome of this regulatory intervention, presently 47 E-waste recycling facilities have been granted registration by different SPCBs/PCCs as on date. The total recycling capacity of these registered recyclers is 2,19,000 MTA (about 27 % of the total E-waste generation in India). The remaining E-waste generation is going into unorganized market for crude dismantling, recovery and reuse, creating havoc on environmental quality as well as occupational health.

The E-waste (Management & Handling) Rules, 2011 was notified in May 2011, which will take effect from May 2012. Concept of Extended Producer Responsibility was introduced in this rule, making producers responsible for environmentally sound management of their end of life products including collection and their channelization to registered dismantler or recycler. These rules will apply to every producer, consumer or bulk consumer involved in the manufacture, sale, and purchase and processing of electrical and electronic equipment or components as specified in schedule I, collection centre, dismantler and recycler of E-waste.

The Ministry of Environment and Forests notified the draft "Plastics (Manufacture, Usage and Waste Management) Rules, 2009" to replace the Recycled Plastics Manufacture and Usage Rules, 1999 (amended in 2003) to regulate the manufacture and usage of plastic carry bags. The draft rules were widely published for public comments. An expert committee was constituted by the Ministry to examine these comments and to suggest economic instruments. These Rules were finalized as Plastic Waste (Management and Handling) Rules 2011 and notified on 04.02.2011.

2.4.3 Recent Initiatives

2.4.3.1 Treatment/disposal Facilities

At present, Common Treatment, Storage and Disposal

Facilities (TSDFs) have been developed for the disposal of land disposable Hazardous Waste (HW) at 29 different places in 16 States namely, Andhra Pradesh (2), Daman, Diu, Dadra & Nagar Havel (1), Gujarat (8), Haryana (1), Himachal Pradesh (1), Karnataka (1), Kerala (1), Madhya Pradesh (1), Maharashtra (4), Odisha (1), Punjab (1), Rajasthan (1), Tamil Nadu (1), Uttar Pradesh (3), Uttarakhand (1) and West Bengal (1). Total waste handling capacities (disposal capacity) of these facilities is 34.21 million MT. Out of these, 14 facilities in eight states have incinerators with incineration capacity of 0.2 million MT per annum (28.05MT/hr). Six TSDFs are under construction.

2.4.3.2 Co-incineration of High Calorific Value Waste

The Ministry has approved the project on 'Trial runs for Co-processing of Hazardous Wastes and other wastes in Cement Plants, Power Plants, Iron and Steel industries' for a total cost of Rs. 5.04 crores. The first installment of Rs. 2.00 crores has been released to CPCB for carrying out trial runs for eight categories of hazardous waste in four plants each of cement, thermal power plants, iron and steel industries during the year 2010-11.

2.4.3.3 Hazardous Waste Management

As per information of Central Pollution Control Board (CPCB), there are 40,000 industries in the country generating about 7.66 million Metric Tonnes (MT) of hazardous waste every year, of which Landfillable waste is 3.39 million MT (44.26%), incinerable 0.65 million MT (8.50%) and Recyclable Hazardous Waste 3.61 million MT (47.13%). A national strategy on hazardous wastes is being prepared to facilitate implementation of an action plan for management of hazardous waste and to fulfill obligations under the Basel Convention on transboundary movement of hazardous waste including their minimization, environmentally sound management and active promotion of cleaner technology.

2.4.3.4 Clean Technology Initiatives

Adoption of cleaner technologies and cleaner production strategies is considered to provide a balance between Development and Environment through economic benefits by way of increased resource efficiency, innovation and reduced cost for environmental management. Key initiatives taken by the Ministry are:

- Five days structured Training Programmes on Capacity Building of Environmental Managers on Cleaner Production/Technology was organized at New Delhi, Hyderabad, Pune, Goa and Jaipur during the current

financial year. A total of 165 Environmental Managers of different sectors of industries were trained.

- Financial assistance was provided for pilot-scale demonstration projects to research institutions of the country for development and promotion of clean technology.
- The Ministry of Environment and Forests has sanctioned a project to Central Pollution Control Board to create a Data Base on the available cleaner technologies in the country as well as abroad.
- During 2010-11, following environmental standards have been notified, i.e., Incinerator for Dyes and Dyes Intermediates Industry; Incinerator for Organic Chemicals Manufacturing Industry; Iron Ore Mining; Cashew Seed Processing Industry; and Revision in norms for Oil and Grease under General Standards. This is in line with developments in other sectors and to control air and water pollution at source.

2.4.3.5 Waste Minimization Circles

To reduce and utilize the waste generated by SMEs, waste minimization circles (WMCs) have been established. These aim to reduce both resource and energy intensity in the participating SME units in a holistic manner. A total of 157 WMCs have been established till date in 41 industrial sectors.

2.4.3.6 Fly ash Utilization

The projections made by Planning Commission as well as Ministry of Power upto 2031-32 indicate that two-third of power generation in the country would continue to depend on coal. The annual generation of fly ash is expected to be around one hundred seventy five million tonnes by the end of XIth Five Year Plan Period, two hundred twenty five million tonnes by end of XIIth Five Year Plan Period and around five hundred million tonnes by 2031-32. The Fly Ash Utilization Notification was issued by Ministry in September 1999 to regulate the disposal of fly ash and ensure its proper utilization. Restriction was imposed to the extent that all brick kilns within the radius of fifty kilometres from coal/lignite based thermal power plants should use 25% fly-ash while making the bricks. A second Notification making amendments was issued in August, 2003 increasing the radius from the thermal power plants to 100 kms.

2.4.3.7 Inventory of Abandoned Dumps

Inventory of abandoned dumps was carried out by SPCBs. There are at present 92 abandoned dumps spread across

various states. Rehabilitation of these waste dumps has been initiated by respective SPCBs. A pilot project for remediation of contaminated sites and to draw up the National Action Plan, with the assistance of the World Bank, has been undertaken.

2.4.3.8 Common Biomedical Waste Treatment Facilities

For effective management of bio-medical waste generated from Health Care Facilities (HCFs), Government of India promulgated Biomedical Waste (Management & Handling) Rules in July 1998 (hereafter referred as BMW Rules) under the Environment (Protection) Act, 1986. There has been increase in the number of CBWTFs over the years. Presently there are 177 CBWTFs to facilitate proper treatment and disposal of bio-medical waste in the country. Central Board constituted an expert committee for evaluation of the new state of the treatment technologies for disposal of Bio-Medical Waste of Occupational Environment and Health, Maulana Azad Medical College, New Delhi

2.4.3.9 Mass Awareness

Central Pollution Control Board launched a weekly TV program 'Paryavaran Darshan' on 5th June 2010 on the occasion of World Environment Day. The program is being telecast by national broadcasting agency viz. Doordarshan through DD National (total 19 channels) and 18 regional centres. The Regional Kendra broadcast shall be in the local language and cover region specific environmental issues with co-operation from the State Pollution Control Board.

2.5 Forestry

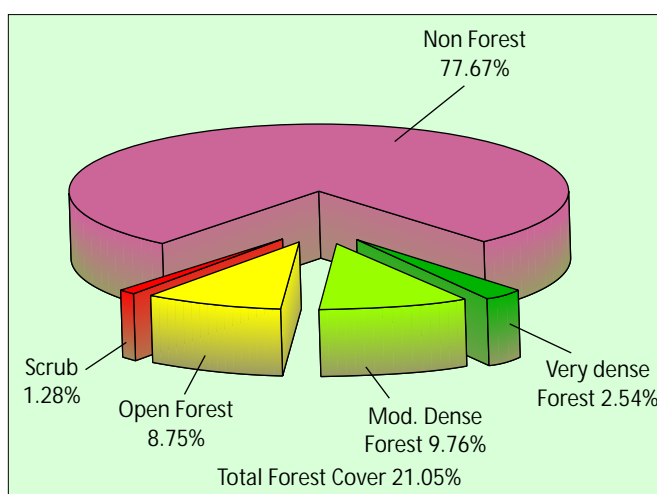
Forests are not just trees, but part of an ecosystem that underpins life, economies and societies. Forests provide a wide range of services which include prevention of soil erosion, floods, landslides, maintenance of soil fertility, and fixing carbon from the atmosphere as biomass and soil-organic carbon.

As per the India State of Forest Report (ISFR) 2011, the Forest and Tree Cover of the country is 78.29 m ha. which is 23.81% of the geographical area of the country. This includes 2.76% of tree cover. The area covered by Very Dense Forests (VDF) is 83,471 km² (2.54%), that with Moderately Dense Forests (MDF) is 320,736 km² (9.76%) and Open Forests is 287,820 km² (8.75%).

Table: Forest and Tree cover of India in 2011

Class	Area (km ²)	% of Geographical Area
Forest Cover		
a) Very Dense Forest	83,471	2.54
b) Moderately Dense Forest	3,20,736	9.76
c) Open Forest	2,87,820	8.75
Total Forest Cover*	6,92,027	21.05
Scrub	42,177	1.28
Non forest	2,553,059	77.67
Total Geographical Area	3,287,263	100

(*includes 4662 Km² area under mangroves)



Source: India State of Forest Report 2011

2.5.1 Impacts and Key Issues

Population pressure, deprivation and inadequate institutional framework have often been viewed as the predominant underlying causes of forest depletion and degradation in India. Population and livestock pressures and the requirements of forest products for essential development generate pressure on forest resources like fuel-wood, fodder, timber, lumber, paper, which in turn triggers deforestation. Over-exploitation of the forest resources, as compared to its incremental and regenerative capacities, escalates the forest depletion and degradation process.

2.5.2 Policy and Legal Measures

The National Forest Policy, 1988 aims to increase the area

under forests in the country to 33% through massive afforestation programmes and protection of the existing forest cover, regulating management of forest based industries and building on the symbiotic relationship between forests and the forest dwellers.

The Ministry of Environment and Forests and the Ministry of Tribal Affairs constituted a Joint Committee in April 2010 to review the implementation of the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 popularly known as Forests Rights Act (FRA) in the country with a specific TOR outlined for the purpose. The Committee members were selected from a wide spectrum of background and expertise consisting of retired civil servants, forest officers, tribal department officers and representatives of Civil Society Organizations and NGOs.

India is playing a positive role and has taken a firm stance in favour of a comprehensive *REDD+* approach. It has presented an ambitious Green India Mission programme under its National Action Plan on Climate Change. The Mission will help in improving ecosystem services in 10 million ha. of land, and increase flow of forest based livelihood services to, and income of, about 3 million forest dependent households.

2.5.3 Externally Aided Projects

The Ministry, in order to supplement the efforts to increase the forest cover, is also implementing eleven state-sector externally aided projects through ten different state governments and one central-sector capacity building project with a total outlay of Rs. 6678 crores, with financial aid from Japan International Cooperation Agency (*JICA*). These projects are reimbursed their actual expenditure as per the loan agreements. The funds are utilized for rehabilitation of forest land with the aim to increase forest cover and to improve the livelihood of people in the villages adjoining the forests by ensuring people's participation. These measures include strengthening JFM institutions, augmenting the supply of fuel-wood and fodder, promote farm forestry, agro-forestry and sustainable *NTFP* collection, soil and water conservation measures with the aim to sustainable management of forests, increasing productivity from forests as well as diverting pressure from natural forests so that they can perform their legitimate environmental services.

2.5.4 Recent Initiatives

- Presently, there are more than one lakh JFMCs

managing an extent of 22 *mha* involving more than 23 million people residing within the periphery of forest area. The XI plan outlay for the scheme is Rs. 600 crores. The allocation for the year 2010-11 is Rs. 65 crores.

- During the year 2009-10, the total 1507 proposals involving about 86,967 ha. forests land have been accorded clearance under the forest conservation act. Similarly, during first nine months of the financial year 2010-11, total 1700 proposals involving about 35,530 ha forest land have been accorded clearance.
- The new state plan scheme titled 'Accelerated Programme of Restoration and Regeneration of Forest Cover' has been introduced during 2009-10, for providing additional central assistance to afforestation efforts.
- For managing mangroves more effectively, the Ministry has decided to work out modalities for setting-up a 'National Institute for Research in Mangroves and Coastal Bio resources' in West Bengal, in proximity to the Sundarbans.
- An initiative started by The Ministry in November 2005, the forest fire data generated by *MODIS* satellite system is overlaid on the forest cover map made by interpretation of satellite images. The coordinates of the forest fire points are listed and uploaded on the Forests Survey of India (FSI) website (www.fsi.nic.in). In March 2010, a sms/email alert service was launched under which if any Internet user gets registered on the FSI website with mobile number and email address then the user gets an sms/email alert every day, summarizing the forest fire points detected in his area of interest in the last 24 hours. The service has been received well and preliminary feedback suggests over 95% accuracy level.

2.6 Biodiversity and Wildlife

India is a recognized megadiverse country rich in biodiversity and associated traditional knowledge, with just 2.4% of the land area. India accounts for nearly 7% of the recorded species even while supporting almost 18% of human population. It is home to over 91,200 species of animals and 45,500 species of plants and has four identified hotspots. India is also home to about 7.6% of all mammalian species, 12.6% of avian species, 6.2% of reptilian species, and 6.0% of flowering plant species. Due to increasing anthropogenic pressures, many species are under threat. A network of 668 Protected Areas (PAs) has been established, extending over 1,61,221.57 sq. kms. (4.90% of total geographic area), comprising 102 National Parks, 515

Wildlife Sanctuaries, 47 Conservation Reserves and 4 Community Reserves. In all, 40 Tiger Reserves and 28 Elephant Reserves have been designated for species specific management of tiger and elephant habitats. UNESCO has designated five protected areas as World Heritage Sites, in view of their uniqueness and richness in flora and fauna. As the ecosystems and species do not recognize political borders, the concept of Transboundary Protected Areas has been initiated for coordinated conservation of ecological units and corridors with bilateral and/or multilateral cooperation of the neighboring nations. There are four categories of the Protected Areas viz, National Parks, Sanctuaries, Conservation Reserves and Community Reserves.

State-wise details of the Protected Area Network of the country

S. No	State/UT	No. of National Parks	No. of Wildlife Sanctuaries	No. of Conservation Reserves	No. of Community Reserves
1	Andhra Pradesh	6	21	0	0
2	Arunachal Pradesh	2	11	0	0
3	Assam	5	18	0	0
4	Bihar	1	12	0	0
5	Chhatisgarh	3	11	0	0
6	Goa	1	6	0	0
7	Gujarat	4	23	1	0
8	Haryana	2	8	2	0
9	Himachal Pradesh	5	32	0	0
10	Jammu & Kashmir	4	15	34	0
11	Jharkhand	1	11	0	0
12	Karnataka	5	22	2	1
13	Kerala	6	16	0	1
14	Madhya Pradesh	9	25	0	0
15	Maharashtra	6	35	1	0
16	Manipur	1	1	0	0
17	Meghalaya	2	3	0	0
18	Mizoram	2	8	0	0
19	Nagaland	1	3	0	0
20	Odisha	2	18	0	0
21	Punjab	0	12	1	2
22	Rajasthan	5	25	3	0
23	Sikkim	1	7	0	0
24	Tamil Nadu	5	21	1	0
25	Tripura	2	4	0	0
26	Uttar Pradesh	1	23	0	0
27	Uttaranchal	6	6	2	0
28	West Bengal	5	15	0	0
29	Andaman & Nicobar	9	96	0	0
30	Chandigarh	0	2	0	0
31	Dadar & Nagar Haveli	0	1	0	0
32	Lakshadweep	0	1	0	0
33	Daman & Diu	0	1	0	0
34	Delhi	0	1	0	0
35.	Pondicherry	0	1	0	0
	TOTAL	102	515	47	4

2.6.1 Impacts and Key Issues

Traditional and substantial dependence on biodiversity resources for fodder, fuel wood, timber and minor forest produce has been an accepted way of life for the rural population that accounts for nearly 74 per cent of India's population. With radical demographic changes, the land to man ratio and forest to man ratio has rapidly declined. The lifestyles and the biomass resource needs having remained unchanged, the remnant forests have come under relentless pressure of encroachment for cultivation, and unsustainable resource extraction rendering the very resource base unproductive and depleted of its biodiversity.

2.6.2 Policy and Legal Measures

Although a number of policy, legal and administrative measures are in place to address various aspects of biodiversity conservation [including Wildlife (Protection) Act, 1972, Forest (Conservation) Act, 1980, Biological Diversity Act, 2002, etc.], there is a need to promote greater harmony and synergy in these measures. Effective enforcement of existing laws needs attention. For tribal dominated areas, the implementation of existing laws is to be gauged in the light of sixth schedule of the Constitution. The Wild Life (Protection) Act, 1972 establishes the legal framework for the protection and conservation of various species of plants and animals and the proper management of their habitats. The Act includes, but is not limited to, the regulation and control of trade in parts and products derived from such species.

Under the National Biodiversity Act, a three tier structure has been established, namely, National Biodiversity Authority (NBA), State Biodiversity Boards (SBBs) and Biodiversity Management Committees (BMCs) to conserve biodiversity and promote its sustainable use and to ensure fair and equitable sharing of the benefits derived from the use of genetic resources including traditional knowledge.

A National Board for Wildlife (NBWL), chaired by the Prime Minister of India provides for policy framework for wildlife conservation in the country. The National Wildlife Action Plan (2002-2016) was adopted in 2002, emphasizing the people's participation and their support for wildlife conservation.

The Govt. of India constituted a statutory body, the Wildlife Crime Bureau on 6th June 2007, by amending the Wildlife (Protection) Act, 1972, a special act to protect the wildlife in the country. The bureau would complement the efforts of

the state governments, primary enforcers of the wildlife (Protection) Act, 1972 and other enforcement agencies of the country. The function of this act includes collection of intelligence, establishing of national crime database, coordination, implementation of international convention, capacity building for scientific and professional investigation and assisting the state governments to ensure success in prosecution.

2.6.3 Recent Initiatives

As per the findings of the recent (2011) all India estimation of tigers using the refined methodology, the total country-level population of tigers is 1706 (mid-value); the lower and upper limits being 1571 and 1875 respectively. The recent assessment of the tiger population is based on determining spatial occupancy of tigers throughout potential tiger forests and sampling such forests using camera traps in a statistical framework. This assessment is not comparable to the earlier total count using pugmarks owing to several shortcomings in the latter method. The new findings indicated the evidence of new areas populated by tigers, e.g. Kuno-Palpur Wildlife Sanctuary and Shivpuri National Park in Madhya Pradesh. The positive trends in tiger population estimates in source sites are encouraging. The fact that better protected tiger source sites have maintained viable tiger populations underscores the importance of strong managerial support. However, the area occupied by tigers outside protected areas has gone down considerably. This highlights the need for securing corridors for tigers to move between source sites.

Ministry has also constituted a National Tri-State-Chambal Sanctuary Management and Coordination Committee (NTRIS-CASMACC) for protection, conservation and recovery of critically endangered *Gharial (Gavialis gangeticus)* in its natural habitats in Chambal and Girwa rivers in three States of Madhya Pradesh, Rajasthan and Uttar Pradesh.

2.7 Coastal Resource Management

The coastal environment plays a vital role in a Nation's economy. The Indian coastline harbours productive habitats and rich biodiversity all along the 7500 km stretch, including the oceanic islands of Andaman & Nicobar and Lakshadweep. The Ministry has published a Coastal Regulation Zone (CRZ) Notification, 2011 on 6th January, 2011 which declares certain coastal zone as Island protection Zone and imposes a number of restrictions on the setting up and expansion of industries, operations or

processes in order to provide livelihood security to the local communities, including the fisherfolk and tribals, to promote conservation and protection of Islands, unique environment and its marine area and to promote development through sustainable integrated management plan based on scientific principles taking into account the vulnerability of the coast to natural hazards.

Central Government has declared the coastal stretches of seas, bays, estuaries, creeks, rivers and back waters which are influenced by tidal action (in the landward side) up to 500 m from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as "Coastal Regulation Zone" (CRZ), on 19.2.1991.

2.7.1 Policy and Legal Measures

Ministry has issued the Coastal Regulation Zone Notification, 2011 in supersession of Coastal Regulation Zone Notification, 1991 after a series of consultations with the various stakeholders including the fishermen community. The objective of the new Notification is to ensure livelihood security to fishing and other local communities living in coastal areas, to conserve/protect coastal stretches and to promote development based on scientific principles.

The notification covers the categorization of CRZ areas, permissible and prohibited activities, regulation of permissible activities in CRZ areas, procedure for clearance, preparation of Coastal Zone Management Plans, demarcation of hazard line along the coastline including shoreline change, mapping and areas requiring special consideration etc.

2.7.2 Recent Initiatives

Keeping in mind the changing scenario of the coastal environment and impact of climate change, the Ministry is taking the following steps for coastal management:

- A national training programme for conservation of mangroves for managers and researchers held from 1st to 4th April 2010, sponsored by MoEF at GEER foundation, Gandhinagar, Gujarat.
- A draft Island Protection Zone Notification has been issued, providing special dispensation for Andaman and Nicobar and Lakshadweep Islands, inviting suggestions.
- In view of the livelihood security of coastal communities, the Ministry has initiated an Integrated

Coastal Zone Management Project with the World Bank assistance at an outlay of about Rs. 1153 crores. Under this project various components including mangrove afforestation, coral restoration, shoreline protection, hazard mitigation, alternative livelihood are being implemented. To implement the above project, Society of Integrated Coastal Management (SICOM) has been established as a registered body. This Society will be implementing the Coastal Zone Management projects having four major components namely, (i) National Coastal Management Programme, and three ICZM projects in three States namely, Gujarat, Odisha and West Bengal.

2.8 Climate Change and its Impact

Climate Change is recognized as a global environmental Phenomenon that requires urgent attention. It is high on the political agenda of the international community as there is a realization that human-induced global warming is an existential threat to the planet. In general, the impacts of climate change will be disproportionately higher for developing countries and the poor of all countries, thus exacerbating inequities in access to adequate food, clean water, and other resources. India, with its geo-physical and climate characteristics, is vulnerable to the occurrence of extreme events. The country is highly susceptible to climate change, not only because of high physical exposure, but also because livelihoods and economic activities are closely tied to the natural resource base. International community is, therefore, engaged in finding ways to enhance global and national actions to address the problem in a cooperative manner.

2.8.1 Projected Impacts

As a part of India's Initial National Communication to the UNFCCC, impacts of climate change on water resources, agriculture, natural ecosystems and forestry, human health, infrastructure and energy were assessed and reported for the 2050s and 2080s. The assessment did not specifically articulate impacts at sub national level, especially the impacts on climate sensitive regions in India.

The INCCA report brings together a review of what is known about the impacts of climate variability in the four major climate sensitive regions in India, namely, the Himalayan region, the North-Eastern region, the Western Ghats and the Coastal region. Further, it presents an assessment of the impacts of climate change in the 2030s on four key sectors

of the economy that are climate dependent, namely, Agriculture, Water, Natural Ecosystems and Biodiversity and Human Health. The impact of climate variability in the four major climate sensitive regions are depicted below:

Temperature: An overall warming ranging from 1.7°C to 2.0°C by the 2030s for all the regions is projected with the maximum increase in North-eastern and Coastal regions of India.

Precipitation: All regions of India are projected to experience an increase in precipitation in 2030s with respect to 1970s with the maximum in the Himalayan region and minimum in the North Eastern region. The extreme precipitation events are likely to increase by 5-10 days in all the regions.

Agriculture: The report which has assessed impacts of climate change for four major crops such as maize and sorghum, rice, apple and coconut has projected a decrease in yield of maize and sorghum, rice and apple, whereas it has projected an increase in the coconut yield.

Water: Water yield is projected to increase in the Himalayan Region whereas it is variable across the other three regions.

Health: The report has projected that malaria disease is subjected to spread in new areas and there are chances of its transmission to reach a wider region.

Natural Ecosystem and Biodiversity: The report has projected a modification of varying degrees in the composition of the forest with increase in Net Primary Productivity in the range of 20-60%.

2.8.2 Recent Initiatives

India has already taken a number of actions on a voluntary basis with its own resources in pursuance of a sustainable development strategy. India firmly believes that the issue of climate change and global warming is not country-specific but is inter-dependent in nature and requires cooperation among nations at the international, regional and bilateral level. To achieve this goal, India has followed a number of pro-active domestic policies. Some of these are outlined below.

- Adoption of National Action Plan on Climate Change which has a mix of both mitigation and adaptation measures. The Eight National Missions which form the core of the National Action Plan represent multi-prolonged, long term and integrated strategies for achieving key goals in the context of climate change. Adaptation is the focus of the NAPCC.

- India has announced a domestic goal of reducing the emission intensity or our output by 20-25% by 2020 in comparison with the 2005 level. This will be achieved through a multi sector sustainable development strategy through the 12th Five Year Plan. The Plan will include an ambitious programme for supporting actions aimed at addressing climate change both at the National and State levels.
- Action on several national missions has picked up pace. The National Mission for Enhanced Energy Efficiency is designed to implement a scheme for trading in energy efficiency certificates that will cover about 700 industrial units and achieve a saving of almost 17,000 MWs of energy by 2017. A process of setting up energy efficiency norms for buildings and implementing a standards and labeling system for several appliances is a part of the Mission. Fuel efficiency norms will also be adopted. Solar Mission will generate 20,000 MWs of power by 2020.
- Understanding the science of climate change is key to taking effective action. Ministry has established an Indian Network for Climate Change Assessment (INCCA) to carry out scientific studies of various aspects of Climate Change. INCCA has come up with a 4x4 assessment of climate change of four major sectors in four ecological regions of the country. An updated inventory of the GHG emissions was also brought out in 2010. Our first National Communication (NATCOM) was given to the international community in 2004. The second one is under preparation and will be submitted in 2012.
- India is among the few countries where the forest cover is actually increasing. Ministry has taken strong measures to conserve forests. Our forest cover is increasing by 0.8 million hectares every year and is helping to neutralize annually more than 10 per cent of India's greenhouse gas emissions. India is launching an ambitious Green India Mission to increase the quality and quantity of forest cover in 10 million hectares of land.
- A major new programme on coastal zone management has also been launched recently. Besides protecting environment in coastal areas, the programme will also help over 300 million people in our country that live in vulnerable areas near our coast line.
- Government has been engaged in building coalition of like minded countries at the international level to press for constructive solutions to this global pressing issue

and enhance bilateral cooperation. India took lead in organizing the conference of BASIC Ministers in February 2011 to discuss and coordinate such efforts.

2.9. Biosafety

Genetic engineering (modern biotechnology) promises remarkable advances in medicine, agriculture, and other fields. However, being a relatively new field much about the interaction of Genetically Modified Organisms (GMOs) with both biotic and abiotic environment is yet to be known. This raises apprehensions about the new technology which include its potential adverse effects on biological diversity and risks to human health.

2.9.1 Policy and Legal Measures

Government of India is one of the early movers in acknowledging the potential risks from modern biotechnology and addressing it through a robust legal framework which came into force in the year 1989 itself i.e. much before the recognition of the issue at international level. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. It was adopted on 29th January, 2000 and entered into force on 11th September, 2003. India is a party to the Protocol.

Genetically modified organisms (GMOs) and products thereof, including GM crops, are regulated in India by the 'Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/ Genetically Engineered Organisms or Cells, 1989 notified by the Ministry of Environment and Forests through their Notification No. 621 in Official Gazette of Govt. of India on 5th December, 1989 under the provisions of the 'Environmental Protection Act', 1986. These rules and regulations commonly referred as Rules 1989 cover areas of research as well as large scale applications of GMOs and their products. These rules and regulations are implemented by Ministry of Environment and Forests Department of Biotechnology (DBT) and State Governments through various committees.

The Government Notification mandates the creation of six committees. While the Recombinant DNA Advisory

Committee (RDAC) is of advisory nature in its function, the Review Committee on Genetic Manipulation (RCGM) established under the DBT, supervises research activities including small scale field trials. Approvals for large scale trials, releases and commercialization of GMOs are given by the Genetic Engineering Approval Committee (GEAC), the apex body established under the MoEF. The State Biotechnology Coordination Committee (SBCC) and District Level Committees (DLCs) have a major role in monitoring. The Rules, 1989 also mandates that every institution engaged in GMO research establish an Institutional Biosafety Committee (IBSC) to oversee such research and to interface with the RCGM in regulating it. In addition to the above, a Monitoring cum Evaluation Committee (MEC) has been set up by the RCGM to monitor the compliance and field performance of GM crops.

Rules, 1989 is supported by the following bio-safety guidelines which are regularly updated, keeping in tune with the international practices and developments in biotechnology:

- Recombinant DNA Safety Guidelines, 1990 & 1994
- Revised Guidelines for Research in Transgenic Plants and Guidelines for Toxicity and allergenicity Evaluation, 1998
- Guidelines and SOPs for the conduct of Confined Field Trials of Transgenic Plant, 2008
- Guidelines for the Safety Assessment of GM Foods, 2008
- Protocol for Safety Assessment of Genetically Engineered Plants /Crops, 2008.

These guidelines and protocols are being regularly updated through a consultative approach and following the international norms prescribed by the Organization for Economic Co-operation and Development (OECD), CODEX Alimentarius Commission and International Plant Protection Convention (IPPC).

The Government of India is following a policy of case by case approval of GM crops. Any company involved in the development of GM crops has to undertake extensive biosafety assessment which includes environmental safety assessment as well as food and feed safety even if it has been approved for commercial cultivation in other countries.

As of date, the GEAC has approved environmental release of only Bt cotton, expressing six events, which is under

commercial cultivation in India in more than 90 lakhs hectare of land area. Moratorium was imposed on commercial cultivation of Bt brinjal on 9th February, 2010, following a seven-city public consultation process, thus putting on hold the 14th October, 2009 recommendation of the Genetic Engineering Approval Committee (GEAC) for commercial release of Bt brinjal. Further consultation on the issue is in progress. In addition, 20 transgenic crops are under various stages of research and field trial.

2.9.2 Recent Initiatives

The Genetic Engineering Approval Committee (GEAC), the apex body under Rules, 1989 has the mandate to accord approval of activities involving (i) large scale use of GMOS in research and (ii) environmental release of GMOs. Rules, 1989 is implemented through biosafety guidelines and is continuously upgraded, taking into account scientific developments in biotechnology, international experiences and commitment. The recent initiatives towards strengthening of the biosafety management system include the following:

- Review of the Rules, 1989 to ensure harmonization with the commitment under CPB is in progress.
- Draft guidance document for information/data generation for safety assessment of GE plants during Biosafety Research Trials Level I (BRL-I) and BRL-II has been formulated and awaiting GEAC approval.
- Capacity building initiatives to strengthen the legal and administrative measures to support the proposed reforms is in progress.
- The GEAC website is being completely revamped to ascertain easy online availability of all the information pertaining to GMOs and GEAC approvals including minutes, biosafety data, guidelines etc.
- Under the Rules, 1989 State government has an important role in monitoring of the GM Crop field trial. Accordingly, GEAC in its meeting on 06.07.2011 decided that the procurement of No Objection Certificate (NOC) from State Government for conduct of GM crop field trials in the State is a pre-requisite for getting approval from GEAC.

2.10 Environment Education, Awareness and Training

The emergence of environmental issues at the top of the global agenda in the context of climate change concerns

underline the need for collective endeavour for protection of environment. This warrants informed and voluntary participation of all sections of the people in the movement for conservation and participation of environment. Awareness of people about emerging environmental issues and the interconnections between the life styles and environment is an essential prerequisite for such participation.

Population increase, rapid urbanization and industrialisation, increasing needs of energy etc., have impacted the availability of natural resources besides denting the quality of environment. The environmental damage already inflicted cannot be reversed unless there is collective thinking, will and effort. These call for public awareness and participation for bringing about an attitudinal change and finally restricting further damage to the environment. Effective implementation of environmental management and conservation programmes depends on education, awareness raising and training in the relevant areas. Without an adequate awareness of the impending challenges and their implications, few people would be motivated to participate actively in programmes on environmental conservation. Environment education and awareness thus assumes critical importance.

The 'Environmental Education, Awareness and Training' is a flagship scheme of the Ministry for enhancing the understanding of people at all levels about the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment.

The flagship programmes under environmental education and awareness include the National Environment Awareness Campaign (NEAC) and the National Green Corps (NGC) Programme which are implemented all over the country in a decentralized mode.

National Environment Awareness Campaign

The National Environment Awareness Campaign (NEAC) is launched all over the country every year on an agreed environmental theme in which more than 10,000 organisations including central and state government departments, education institutions, NGOs and other voluntary agencies participate. Diverse target groups encompassing students, youths, teachers, tribals, farmers, other rural population, professionals and the general public are covered under NEAC. The programme is implemented

through designated Regional Resource Agencies (RRAs) appointed for specific States/Regions of the country. The NEAC theme for 2010-11 is biodiversity conservation.

National Green Corps Programme

National Green Corps (NGC) Programme is a knowledge-based programme in which knowledge empowered teacher-in-charge of Eco-clubs transmits awareness to children through various activities. In less than ten years, that the programme has been in operation, it has been catapulted into a mass movement of children for maintaining and preserving the environment. 1,30,931 Eco-clubs have so far been established in NGC Schools across the country.

National Museum of Natural History

The National Museum of Natural History (NMNH), New Delhi is an institution devoted to Environmental Education (EE). The Museum was opened to the public in 1978 on June 5 on the occasion of World Environment Day. The Museum undertakes EE through the means of Exhibition programmes and Educational activities. Even though the primary target audience of the Museum is school students, it has developed programmes for other categories of people as well. The NMNH is the pioneer Museum which has initiated several specialized programmes to cater to the needs of persons with different abilities.

Paryavaran Mitra Programme

"Paryavaran Mitra", one of the largest sustainability and climate change education programmes in the world, was launched on 24 July 2010. Paryavaran Mitra is a programme for students that envision creating Paryavaran Mitra (Friends of the Environment) in schools across India. The goal of the programme is to create a network of young people across the nation who has the knowledge, awareness and commitment to meet the challenges of global citizenship and climate change.

Ganges River Dolphin Conservation Education

Ministry of Environment and Forests has initiated a two-year project on Ganges River Dolphin Conservation Education Programme in the north, north eastern and eastern region of India. A total of 20 locations have been identified in Assam, Bihar, Uttar Pradesh and West Bengal to conduct school activities in each location with 25 clusters of schools. To facilitate activities, partner NGOs have been selected for carrying out education activities focusing on river dolphins.

Global Learning and Observations to Benefit the Environment

The Global Learning and Observations to Benefit the Environment (GLOBE) Programme – an International Science and Education programme – provides a unique opportunity to the school students to carry out various measurements so that they can learn about scientific protocols and perform environmental learning activities, which have already been introduced as theory in the textbooks. The GLOBE programme not only helps the students to appreciate the contents of the textbooks through better understanding but also assists them in gaining complete knowledge of environment.

2.11 Environmental Information System

Realizing the need for environment information, the Ministry set up an Environmental Information System

(ENVIS) in 1983 as a comprehensive network on information collection, collation, storage, retrieval, and dissemination to various users including decision-makers, researchers, academicians, and policy planners. ENVIS network at present consists of a chain of 67 network partners, out of which 39 are on subject-specific and 28 are on State/UT related issues. These network partners are called ENVIS Centres and are located in the notable organizations/ institutions/State/UT Government Departments/Universities throughout the country. The Focal Point of ENVIS is located in the Ministry and coordinates the activities of all the ENVIS network partners to make ENVIS a web enabled comprehensive information system. ENVIS Focal Point in the Ministry is responsible for maintenance and updation of the website of the Ministry (URL: <http://www.moef.gov.in>) and disseminating information through the website to all concerned.

Need for Inclusive Growth

3.1 Introduction

Inclusive growth ensures that any development or economic growth in the country is equitable and reduces the disparities between rich and poor and other marginalized sections of society. While the nation needs to move towards a economy that reduces environmental risks and ecological scarcities, there is an immediate need to improve social equity and human wellbeing. This can only be done through the elimination of poverty and fulfillment of all basic needs. Protection of the environment has to be a central part of any sustainable inclusive growth strategy. Population growth, urbanization, and anthropogenic development which largely employ energy-intensive technologies have resulted in injecting a heavy load of pollutants into the environment.

An important feature of any environmental strategy is that environmental objectives require action in several areas, which typically lie in the purview of different ministries. The Ministry of Environment and Forests has the important role of monitoring the development process and its environmental impact in a perspective of sustainable development and to devise suitable regulatory structures to achieve the desired results. While this role is crucial, environmental objectives can only be achieved if environmental concerns are internalized in policymaking in a large number of sectors. This would require sharing of responsibility at all levels of government and across sectors with respect to monitoring of pollution, enforcement of regulations, and development of programmes for mitigation and abatement. Regulatory enforcement must also be combined with incentives, including market and fiscal mechanisms to encourage both industry and people in their day-to-day working lives to act in a manner responsive to environmental concerns. Sustainable use of natural resources requires community participation with a responsible role assigned to the communities for conservation.

3.2 Current Initiatives

To meet the basic needs of the poor, eliminate the vicious cycle of poverty and achieve the Millennium Development

Goals (MDGs) there are several initiatives being taken by the government in terms of education, access to safe water and sanitation and improved housing. It is often the poor who are directly dependent on natural resources for their livelihoods, whether it is agriculture, forest produce or fresh water and coastal resources. Thus, the poor are also most vulnerable to climate change and its impacts. The need of the hour is to ensure that sustainable jobs are created and ecosystems are made more resilient to support livelihoods. Initiatives to ensure this that are already in place include the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA), the National Rural Livelihoods Mission, Integrated Watershed Development Programme (IWMP) and Integrated Coastal Zone Management (ICZM).

There is also a significant disparity between urban and rural consumption of resources, especially energy. Recognizing this disparity, one of the pillars of the 12th five year plans is low carbon inclusive growth that will enhance the accessibility of energy in rural areas.

There will be new challenges faced by the poor and vulnerable due to adverse environment related impacts. These include weather related disasters, changes in rainfall patterns including scarcity of water, sea level rise and changes in species composition, including a decline of important species. There are several initiatives in place or in the pipeline that are in place to build resilience of communities to adapt to climate change such as the National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC). To take into account specific local level realities, these plans can be complimented by Local Adaptation Plan of Action (LAPAs), which are being formulated on a pilot basis in other developing countries.

While uncertainties exist in terms of climate change impacts, there are certain measures that can be put in place that will lead to the development of the poor and marginalised and be effective in adapting to climate change. These options will depend on the eco-system, however certain steps like the setting up of early warning systems, livelihood diversification, water management,

conservation initiatives and the diversification of species are some effective options. Other options to ensure food security include crop insurance, seed banks, efficient irrigation methods like drip and sprinkler and rain water harvesting, agro-forestry and other methods of crop diversification.

Several options also exist to increase resource efficiency such as waste management including waste to wealth initiatives, recycling, renewable energy, eco housing, clean technology promotion in the micro, small and medium industries as well as environmentally responsible initiatives from large initiatives.

Ministry of Environment and Forests is well aware of the fact that it is vital to involve the local people in the decision-making process of environmental conservation in a sustainable manner. In environmental terms, community-based initiatives, along with policy reforms, could go a long way in protecting the environment and enhancing the productivity of our natural resources. To deal with India's environmental problems in an effective way, it is important to empower people through awareness initiatives so that they can take collective decisions to benefit them and the local environment.

It has been seen that solutions at times emerge easily when governments involve people, using a participatory approach to solve problems. Centuries of careful tending of land on which people depend, is an example of their ability to coexist harmoniously with nature, and each generation has passed on its traditional understanding of managing natural resources to those who have followed. It has been witnessed that such a participatory approach at the community level is as crucial in terms of environmental protection, as has been proved by the success of India's joint forest management initiatives.

Understanding this dire need for inclusive growth, the Ministry involves invariably (wherever necessary) all possible stakeholders in this participatory process which encompasses the entire spectrum of local community representatives, civil society organizations/ NGOs, development sector, industrial sector/business houses, local and state government bodies and central government agencies.

3.3 Environmental Awareness

The environmental damage already inflicted cannot be

reversed unless there is collective action. This calls for public awareness and participation for bringing about an attitudinal change and finally restricting further damage to the environment. Effective environmental management and conservation depends on education, awareness raising and training in the relevant areas. Without adequate awareness of the impending challenges and their implications, few people would be motivated to participate actively in programmes on environmental conservation. Environmental education and awareness thus assume critical importance.

Promoting environmental awareness among all sections of the society entails fulfilling the following objectives:

- Mobilizing people's participation for preservation and conservation of environment.
- Spreading environmental education, especially in the non-formal system among varied sections of the society.
- Facilitating development of environmental education training materials and aids in the formal education sector.
- Promoting environmental education through existing educational institutions.
- Ensuring training and manpower development for environmental education, awareness and training.

3.4 Environmental Communication

The crux of environmental communication is to convince people that there are a number of problems that need urgent attention. This spells out the need for reaching the people with myriad channels of communication, ranging from print and electronic media to folk art and community communicators such as voluntary organizations (NGOs) and action groups to promote environmental awareness among the masses.

3.5 Women Empowerment

It is essential to involve women, especially in rural India, in the decision making processes pertaining to environmental conservation. Ministry is well aware of the significant role of women in household sanitation and health. It is the women of rural India who understand the importance of water scarcity as they are the drawers, carriers and household managers of water. There is need to ensure access to informal environmental education for women in

our country. Most environmental training programmes on soil regeneration, afforestation, energy-saving and water management do not provide learning opportunities for women. Hence, women need better opportunities to translate their knowledge and initiatives into concrete action and control over natural resources, such as water, as well as their own lives. Environmental management is bound to be very effective if women are offered more opportunities in the fields of education, economic and political life and in the decision-making process. All plans

and policies need to be made more gender inclusive.

Summing up the issue of inclusive growth, community participation could be successfully attained through mass awareness regarding environmental challenges. The Ministry is educating people regarding emerging environmental issues and the interconnections between life styles and environment for mass mobilization towards taking a green U-Turn for creating a more humane and environment-friendly world.

Issues for Debate

4.1 Introduction

To address India's environmental challenges, it is essential to focus on diverse response options and instruments for discovering the possible solutions. Emphasis must be placed on increasing the collective responsibility and accountability of all the stakeholders and promoting more co-operative efforts for ensuring a healthy environment.

Spreading awareness and empowering people to take decisions, at the local level, is an effective way of dealing with the environmental problems. In this chapter, some of the critical issues for the country's environment conservation efforts have been put forward before various stakeholders and people at large for their attention and suggestions there on.

4.2 Issues Affecting the Environment

1. Internalization of environmental costs/benefits into Economic Policy

Sustainable Development involves valuing the environment, thus placing proper values on the services provided by natural environments. The central problem is that many of these services are provided "free". They have zero price simply because no market exists where their true values could be revealed through the act of buying and selling (e.g biodiversity in a tropical forest). Zero/low price results in excessive exploitation of these natural resources, resulting in environmental degradation. Hence, there is a need to take the following measures:

- Greater use of market based instruments can facilitate better reflection of environmental costs, thus internalizing environmental aspects in economic policy-making.
- Efforts to integrate environmental values into appraisal of public investment projects need to be introduced, both at the level of understanding environmental effects and at the level of valuing those effects.

2. Natural Resource Management

Many environmental resources have become scarce and some have nearly reached threshold levels. In each location, causes for degradation of natural resources

must be assessed; comparison of demand on the natural resource with its carrying/assimilative capacity be made; and then plans be made for sustainable use of the resource. The deterioration in environmental resources hurts the poor more than the rich because of the dependence of poor people on the resource base for their livelihood and their inability to undertake the averting expenditures. To meet these challenges, following measures should be taken:

- Natural Resource Accounting and scope for designing user charges for environmental services that signal users about their scarcity values.
 - Perverse subsidies on resources should be withdrawn.
 - As far as possible, natural resources prices should reflect their social costs; and subsidies should be targeted only for the poor.
 - Green Accounting, as the idea of placing statistical coverage of environmental concerns in a national accounts framework needs to be explored
- ### 3. Legal reform for pollution prevention and control
- All our environmental legislations come under criminal laws. In implementation of the laws as well as in judicial decisions, the issue is compliance or non-compliance, and not the extent of compliance. The penalties for non-compliance are unrelated to the compliance costs. On the other hand, the economic compliance cost increases with the level of pollution prevention or abatement. This type of pollution control regime creates an opportunity for corruption and rent-seeking.
- Amendments to the environmental laws may be needed to introduce pollution charges and other economic instruments, thus permitting use of more judicious mix of the two regimes.
- ### 4. Administrative and institutional improvements
- Environment involves cross cutting issues and hence it is necessary to bring synergy in various Departments for better implementation of the environmental problems. Following measures should be taken for improving administrative and institutional functioning:
- Need to remove the barriers by exchange of information, visits, meeting, etc, so as to ensure better coordination for timely action for implementation of programmes and activities.

- Strengthening of institutions which, inter alia, includes technical manpower, knowledge-base and integrating science based approaches.
- Need to review our approach to the planning and management by mainstreaming the element of newer technologies and sound science so as to make it more responsive to the emerging environmental challenges.
- Providing more accurate and faster systems, the need to use GIS, GPS, ITeS etc becomes critical not only to the managers of the resources but also for faster and simpler ways of disseminating information.

4.3 Air Environment

The air pollution and the resultant air quality can be attributed to emissions from transportation, industrial and domestic activities. The air quality has been, therefore, an issue of social concern in the backdrop of various activities. The norms for ambient air quality have been revisited and various industry-specific emissions standards are evolved afresh or revisited and notified from time to time.

- Acceleration of national programmes for disseminating Information on improved fuel wood stoves, smokeless chullas, suited to local cooking practices and biomass resources.
- Strengthening of environmental monitoring system.
- Enforcement of emission Standards and preparation and implementation of action plans for both point and non-point sources.
- Promoting reclamation of wastelands through energy plantations for rural energy, through multi-stakeholder partnerships involving the land- owning agencies, local communities, and investors.
- Strengthening efforts for partial substitution of fossil fuels by bio-fuels, through promotion of bio-fuel plantation, promoting relevant research and development, and strengthening regulatory certification of new technologies.
- Recycling of paper, plastic, glass bottles, cardboard, and aluminum cans. This conserves energy and reduces production emissions.

4.4 Noise Environment

Key Challenges identified for maintaining the acceptable level of ambient noise and to improve the quality of life are - religious functions, festivals, marriages, processions industrial activities, use of public address system,

construction activities; use of generator sets for cell phone towers and standby source of electricity; vehicles and pressure horns; and bursting of fire crackers. The noise levels have been prescribed for generator sets and fire crackers. Use of horns has been banned in residential areas during night time and silence zones. Noise barriers are placed on flyovers, etc. in urban areas to absorb or reflect the noise, as the case may be. Apart from this, Ministry has issued various regulations from time to time to control noise pollution in ambient air, at source and at manufacturing stage.

4.5 Water Environment

The core challenge of water resources development and management in India is one of better management. There is a need to build/strengthen the institution to ensure efficient and equitable distribution of water resources. With growing population and increasing economic activity, the pressures on this basic but increasingly scarce resource have grown much faster than the ability of communities and higher level jurisdictions to cope with them. The bulk of the day-to-day environmental and social problems in India's cities and villages emanate from this core challenge. The solution lies in how quickly and how well communities learn to decentralize their management systems and mobilize community ownership and participation in decision making. Operationally, the environmental challenges include:

- Improving efficiencies and minimizing losses in extraction, transport and use of water.
- Addressing the spatial and temporal variations of available rainfall and devising the means to optimize its availability, now and for the future.
- Planning and designing water-related projects as environmental improvement opportunities to maximize the overall benefits, not simply to minimize negative impacts.
- Internalizing waste water minimization, reuse and recycling as an integral feature of all water related projects. Most projects have tended to increase supplies, without adequate attention to demand side management.
- Ensuring adequate reserves for ecosystem requirements.

4.6 Solid Waste Management

While Ministry have a robust regulatory framework in place,

the main challenge is to ensure effective implementation for sustainable waste management. Some of the priority areas that need to be considered are:

- Local bodies are required to identify and select waste processing and disposal sites which should be able to take care for 20-25 years.
- Improvement in the existing landfill sites should be taken up on priority.
- Financial institutions may be approached for seeking loans and State Governments may make arrangements with such institutions for the assistance of local bodies.
- Local bodies should seek authorization from concerned SPCB and interact with SPCB for seeking assistance for ensuring proper management of MSW.
- Training programmes/ workshops should be organized jointly by Directorate of Local/Municipal Administration and SPCB for benefit of staff at all level.
- Local bodies should organize awareness and interaction programmes with NGOs and citizen forums for improving existing systems.
- There is need to strengthen capacity by providing adequate infrastructure of CPCB, SPCBs and urban local bodies for better solid waste management. There is a need of enforcing compliance of various rules.

4.7 Forestry

4.7.1 Low Productivity

The forest productivity in India is low compared to the global average. The Mean Annual Increment (MAI), a measure of forest productivity, is 0.7 cu m/ ha. for Indian forests as against the world average of 2.1 cu m/ha. This has resulted in a demand-supply gap in various forest products, thus leading to forest degradation.

4.7.2 Ownership and Management

Though ownership of forests is largely with the Government, with forest departments being the biggest custodian, there is an increasing involvement of communities in management of forests over the years. The JFM programme is emerging as the alternative management strategy in India. It is estimated that around one lakh Joint Forest Management Committees (JFMCs) formed under JFM are managing around 28% of the total forest area of the country, in collaboration with the state forest departments. However, 69% of the forest area continues to be managed by the government, predominantly by the forest departments.

4.8 Biodiversity and Wildlife

Human activities, both directly and indirectly, responsible for current high rates of biodiversity loss are - habitat loss; fragmentation and degradation due to agricultural activities; extraction (including mining, fishing, logging and harvesting); and development (human settlements, industry and associated infrastructure). Habitat loss and fragmentation leads to the formation of isolated, small and scattered populations. Some of the major issues are:

- Poaching, hunting, smuggling and illegal trade in wildlife and its derivatives
- Control and Eradication of Forest Invasive species
- Forest fire control and management
- Over-exploitation of wild bio resources
- Conservation and Restoration of Unique Vegetation & Ecosystems
- Pollution of atmosphere, water, soil and Global climate change
- Mainstream the concerns of tiger in the landscape surrounding such source sites through restorative actions, while providing livelihood options to local people to reduce their dependency on forests.
- Strengthening of anti-poaching activities, including special strategy for monsoon patrolling, by providing funding support to tiger reserve states, for deployment of anti-poaching squads involving ex-army personnel/home guards, apart from workforce comprising local people, in addition to strengthening of communication/wireless facilities.

4.9 Biosafety

Biotechnology is a very new field, and much about the interaction of GMOs with various ecosystems is not yet known. Some of the concerns about the new technology include its potential adverse effects on biological diversity including agro-biodiversity and potential risks to human health. Potential areas of concern might be unintended changes in the competitiveness, virulence, or other characteristics of the target species; the possibility of adverse impacts on non-target species (such as beneficial insects) and ecosystems; the potential for weediness in genetically modified crops (where a plant becomes more invasive than the original, perhaps by transferring its genes to wild relatives); and the stability of inserted genes (the possibilities that a gene will lose its effectiveness or will be re-transferred to another host).

Biosafety concerns have led to the development of regulatory regimes in various countries for research, testing, safe use and handling of Genetically Modified Organisms (GMOs) and products thereof. India is one of the earliest countries to establish a biosafety system for regulation of GMOs through Rules, 1989. Rules, 1989 is implemented through biosafety guidelines. However, being pertaining to a scientific and complex technical issue, these policies and law need to be continuously upgraded taking into account scientific developments in biotechnology, international experiences and commitment.

4.10 Coastal Resource Management

India's coastal zone is endowed with a wide range of mangroves, coral reefs, sea grasses, salt marshes, sand dunes, estuaries, lagoons, and unique marine and terrestrial wildlife. The abundant coastal and offshore marine ecosystems include 6,740 sq. km. of mangroves, including part of the Sundarbans and the Bhitarkanika, which are among the largest mangroves in the world.

The key issues identified for effective coastal resource management include the following:

- Mapping, delineation and demarcation of the hazard lines all along the mainland coast of India;
- Mapping, delineation and demarcation, as required, of the ecological sensitive areas (ESAs), also all along the mainland coast of India;
- Capacity building of the Ministry as the secretariat for the NCZMA, and nation-wide training programme for integrated coastal zone management;
- Setting up and operationalization of the new National Centre for Sustainable Coastal Zone Management.
- Regular and periodic documentation of mangroves and associated flora and fauna.
- Capacity-building pertaining to bio-prospecting for drugs and other useful compounds from marine flora and fauna, patenting useful innovations as may be

appropriate including, inter alia, benefit-sharing with the local communities.

- Annual monitoring of mangrove cover is necessary and every state should use the existing capabilities or develop relevant capabilities.
- Proper institutional mechanisms need to be developed for involving local stakeholders, including local communities, in mangrove restoration and conservation programmes. The mangrove plantation programme should have the objective of increasing floral diversity in addition to increasing the mangrove cover.
- Capacity-building of the frontline forestry staff for coral monitoring through periodic up-gradation of their skills and knowledge, to ensure the enforcement of various rules and regulations to protect the precious coastal resources, to create policy provisions for mangroves that occur on privately-owned lands, and revenue lands among others. Economic evaluation of conserving coastal and marine biological resources.

4.11 Climate Change

Given the vulnerability of large sections of population to climate change, and keeping in mind the national and state strategy to address climate change as reflected in the NAPCC, the key challenges that have to be addressed by various stakeholders in the short term are:

- How should we involve various stakeholders in implementing NAPCC and SAPCC?
- How should India achieve a low-emission sustainable development growth model using a voluntary approach?

Answers to these two questions will help the economy and its various sectors to grow sustainably, while enhancing the capacity of the society and stakeholders at various levels to adapt to adverse effects of climate change.



जहाँ है हरियाली ।
वहाँ है ख़ुशहाली ॥

Ministry of Environment and Forests

GOVERNMENT OF INDIA

Paryavaran Bhawan, C.G.O. Complex, Lodhi Road
New Delhi - 110 003, India
<http://www.moef.gov.in>

