



XI Conference of Parties  
CONVENTION ON BIOLOGICAL DIVERSITY  
HYDERABAD INDIA 2012



सत्यमेव जयते

# ANNUAL REPORT 2011-12



(<http://moef.gov.in>)



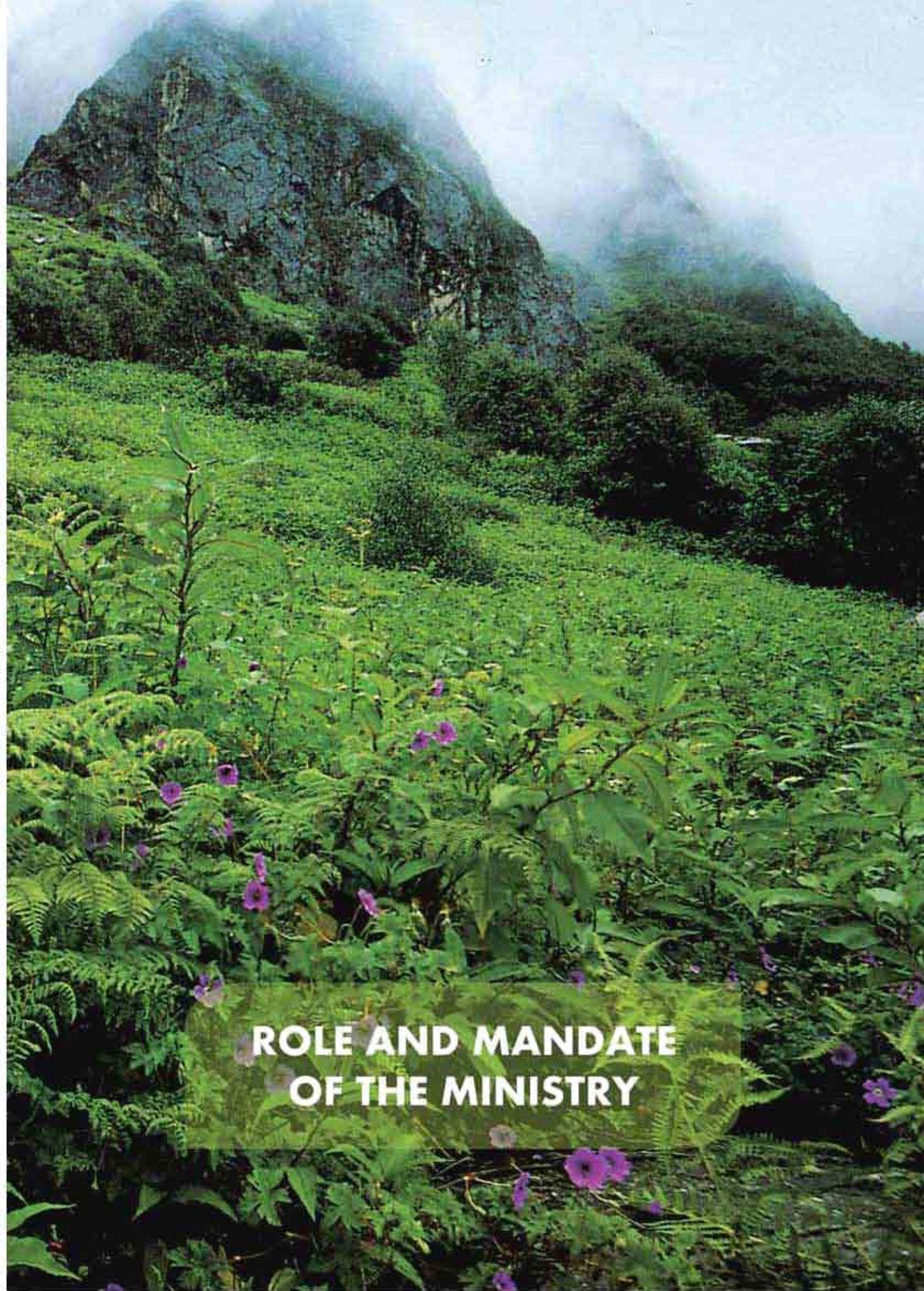
जहाँ है हरियाली ।  
वहाँ है खुशहाली ॥

**Ministry of Environment & Forests**  
**Government of India**



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**ROLE AND MANDATE  
OF THE MINISTRY**

## Role and Mandate of the Ministry

### Role of the Ministry

The Ministry of Environment & Forests (MoEF) is the nodal agency in the Central Government for overseeing the implementation of India's environment and forest policies and programmes relating to conservation of the country's natural resources including lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals and prevention and abatement of pollution. While implementing these policies and programmes, the Ministry is guided by the principle of sustainable development.

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, and
- 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, a National Conservation Strategy and Policy Statement on Environment and Development, 1992, National Forest Policy, 1988, a Policy Statement on Abatement of Pollution, 1992 and a National Environment Policy, 2006 also guide the Ministry's work.

The organization structure of the Ministry indicating various Divisions and its autonomous and subordinate offices is given at Annexure- I-A & I-B.

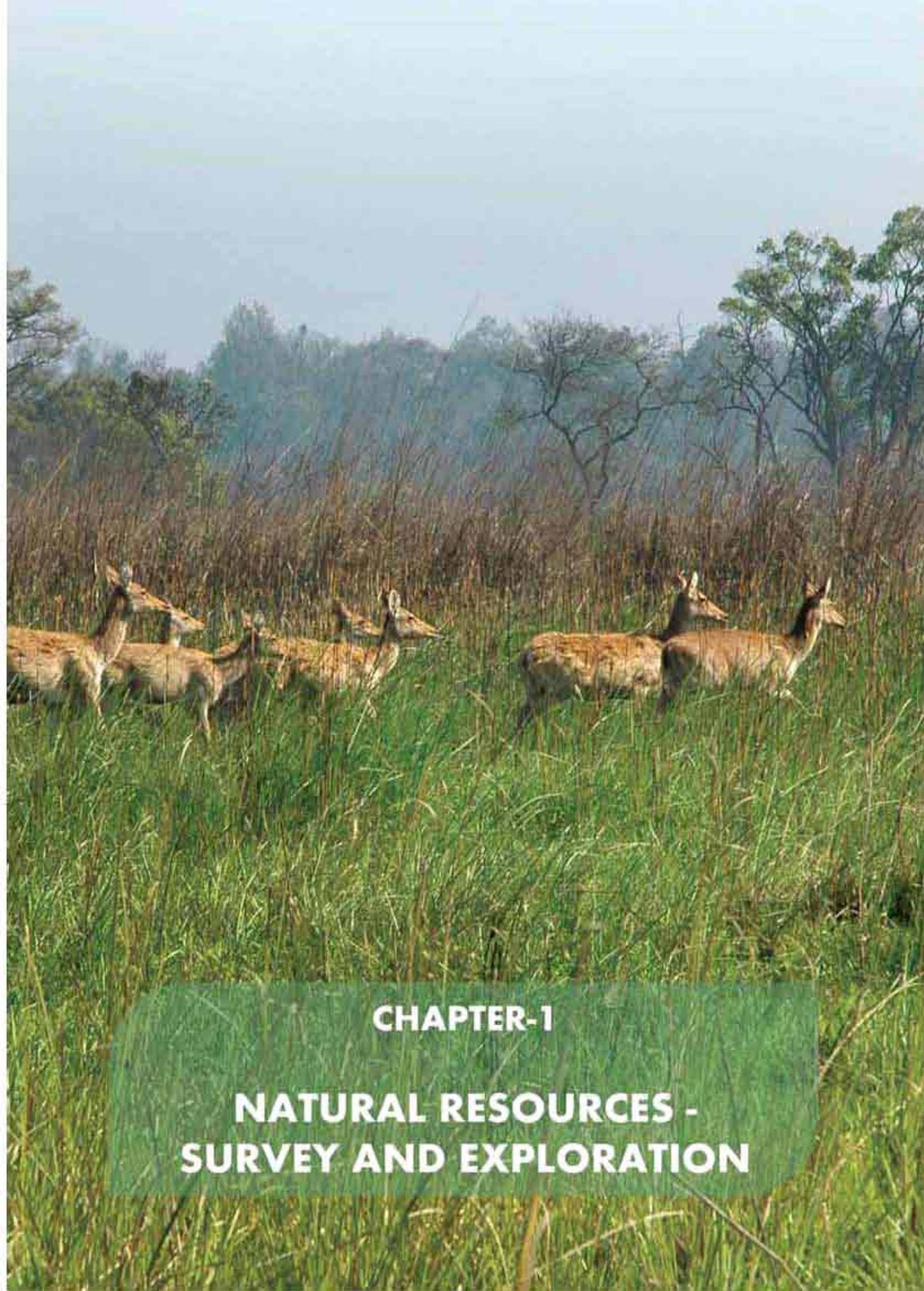


## Mandate of the Ministry

### Allocation of Business

- Environment and Ecology, including environment in coastal waters, in mangroves and coral reefs but excluding marine environment on the high seas.
- Survey and Exploration of Natural Resources particularly of Forest, Flora, Fauna, Ecosystems etc.
- Bio-diversity Conservation including that of lakes and wetlands.
- Conservation, development, management and abatement of pollution of rivers which shall include National River Conservation Directorate.
- Environmental Impact Assessment.
- Environment research and development, education, training, information and awareness.
- Environmental Health.
- Forest Development Agency and Joint Forest Management Programme for conservation, management and afforestation.
- Wildlife conservation, preservation, protection planning, research, education, training and awareness including Project Tiger and Project Elephant.
- International co-operation on issues concerning Environment, Forestry and Wildlife.
- Botanical Survey of India and Botanical Gardens.
- Zoological Survey of India.
- National Museum of Natural History.
- Biosphere Reserve Programme.
- National Forest Policy and Forestry Development in the country including Social Forestry.
- All matters relating to Forest and Forest Administration in the Andaman and Nicobar Islands.
- Indian Forest Service.
- Wild Life Preservation and protection of wild birds and animals.
- Fundamental and applied research and training including higher education in forestry.
- Padmaja Naidu Himalayan Zoological Park.
- National Assistance to Forestry Development Schemes.
- Indian Plywood Industries Research and Training Institute, Bangalore.
- Afforestation and Eco-development which shall include National Afforestation and Eco-Development Board.
- Desert and Desertification.
- Forest Survey of India.
- Indian Institute of Bio-diversity, Itanagar.
- Central Pollution Control Board.
- G.B. Pant Institute of Himalayan Environment & Development.
- Wildlife Institute of India and Indian Board for Wildlife.
- Indian Institute of Forest Management.
- Central Zoo Authority including National Zoological Park.
- Indian Council of Forestry Research & Education.
- Andaman and Nicobar Islands Forest and Plantation Development Corporation Limited.
- Prevention of Cruelty to Animals.
- Matters relating to pounds and cattle trespass.
- Gaushalas and Gausadans.
- The Prevention of Cruelty to Animals Act, 1960 (59 of 1960).
- The National Environment Tribunal Act, 1995 (27 of 1995).
- The National Environment Appellate Authority Act, 1997 (22 of 1997).

- The Water Prevention and Control of Pollution Act, 1974 (6 of 1974).
- The Water (Prevention and Control of Pollution) Cess Act, 1977 (36 of 1977).
- The Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981).
- The Indian Forest Act, 1927 (16 of 1927).
- The Wildlife (Protection) Act, 1972 (53 of 1972).
- The Forest (Conservation) Act, 1980 (69 of 1980).
- The Environment (Protection), Act, 1986 (29 of 1986).
- The Public Liability Insurance Act, 1991 (6 of 1991).



## **CHAPTER-1**

# **NATURAL RESOURCES - SURVEY AND EXPLORATION**

## Survey of Flora

### Botanical Survey of India

#### Introduction

The Botanical Survey of India (BSI) is the apex research organization under the Ministry of Environment and Forests, Government of India for carrying out taxonomic and floristic studies on wild plant resources of the country. It was established on 13<sup>th</sup> February, 1890 with the basic objective to explore the plant resources of the country and to identify the plants species with economic virtues. Sir George King, the then Superintendent of the 'Royal Botanic Garden' Calcutta was appointed as First ex-officio Honorary Director of the BSI. After independence the department was reorganized in 1954 by Government of India as a part of scientific development of the country. During the successive plan periods, the functional base of BSI was further expanded to include various new areas such as inventorying of endemic, rare and threatened plant species; evolving conservation strategies; studies on fragile ecosystems and protected areas, like wildlife sanctuaries, national parks and biosphere reserves; multiplication and maintenance of endemic and threatened plant species, wild ornamentals, etc., in Botanic Gardens and Orchidaria; documentation of traditional knowledge associated with plants and development of National Database of herbarium specimens/live collections/botanical paintings/illustrations, plant distribution and nomenclature, plant uses, etc.

#### Primary objectives of BSI

- Exploration, inventorying and documentation of phytodiversity in general and protected areas, hotspots



Fig-1. Kingcup, Marsh Marigold, *Caltha palustris* endemic to Arunachal Pradesh

and fragile ecosystems in particular; publication of National, State and District Floras.

- Identification of threatened/red list species and species rich areas needing conservation; ex-situ conservation of critically threatened species in botanical gardens.
- Survey and documentation of traditional knowledge (ethno-botany) associated with plants.
- Develop a National database of Indian plants, including herbarium and live specimens, botanical paintings/illustrations, etc.

#### Secondary objectives

- Revisionary/Monographic studies on selected plant groups.
- Qualitative analysis of nutritive value of ethno-food plants and other economically useful species.
- Capacity building in plant taxonomy through refresher courses and post M.Sc. certificate course.
- Environment Impact Assessment of areas assigned by the Ministry.

- Develop and maintain Botanical Gardens, Museums and Herbaria.
- Preparation of Seed, Pollen and Spore Atlas of Indian Plants.

### Activities undertaken during the year

#### Survey and Herbarium Consultation tours

Two hundred and eighty four field/exploration/live plant collection/EIA study/ethnobotanical tours, against the targeted 300 tours, were undertaken so far by different Regional centers and Headquarter units of BSI covering the States/Union Territories of Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Delhi & its environs, Goa, Gujarat, Jammu & Kashmir, Jharkhand, Lakshadweep, Karnataka, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. During these tours c. 25,325 specimens were collected of which c. 11,888 specimens belonging to 3027 species were identified. In addition 68 herbarium/library consultation tours, against the targeted 75 tours, were undertaken so far to various herbaria/library within and outside the department, for confirming the identities or for studying specimens for National, state, district or protected area floras. The important publications during the period include *Flowering Plants of India - Dicotyledons Volume 1*; *Indian Lichens - An Annotated Checklist*; *Materials for the Flora of Arunachal Pradesh Volumes II & III*; *Flora of Tamil Nadu-Grasses*; *Flora of Visakhapatnam District, Andhra Pradesh Volume 2*; *Flora of Pin Valley National Park, Himachal Pradesh*; *Hepaticae and Anthocerotae of Great Himalayan National Park, Himachal Pradesh*; *Meliolales of India, Volume 2*; *Oil Yielding Plants*; *Floral Diversity of*

*Tiger Reserves of India*; *Plants of Indian Botanic Garden and Plant Discoveries 2007, 2008, 2009 & 2010* [four issues] and *Bulletin of the Botanical Survey of India* four volumes (renamed as *Nelumbo* from Volume 51). Hindi publications include *Vanaspati Anveshan 2009 & 2010* (two issues) and *Vanaspati Vani* (five volumes) and Bengali publication namely *Paschim Banglar Udvid* Volumes 5 & 6 were also published. Besides, two books, viz. *Mushrooms of Sikkim - I: Barsey Rhododendron Sanctuary, Ferns and Fern-allies of Sikkim: A Pictorial Handbook - Part I*, were published jointly by BSI and the State Forest Department, Sikkim. In addition one book, *Crotalaria in India* was published through a private publisher. The ENVIS Centre in BSI on Floral Diversity published ENVIS Newsletters (Volumes 12 to 16) and three books viz., *Bibliography and Abstract of Papers on Flora of West Bengal*, *Bibliography and Abstract of Papers on Flora of North East India* and *Bibliography and Abstracts of Papers on Flora of Andaman & Nicobar Islands*.

#### National Flora (Flora of India)

Work on families Acanthaceae, Begoniaceae, Chenopodiaceae,



Fig-2. *Humboldtia brunonis* - endemic to the Western Ghats- between Wayanad and Sringeri Regions of Central Sahyadri.



Fig-3. *Impatiens devendrae* Pusalkar, endemic to Uttarakhand

Cyperaceae, Juncaceae, Lauraceae, Loganiaceae, Moraceae (excluding *Ficus*), Nyctaginaceae, Orchidaceae (subtribe Malaxaeae & Liparideae incl. Genera *Crepidium*, *Dienia*, *Liparis*, *Oberonia*, *Oreorchis*, *Siedenia*), Polygonaceae, Ranunculaceae (*Ranunculus*), Salicaceae, Thymelaeaceae have been completed. Checklist of Gymnosperms, Lichens, Marine algae, Cyanophyceae, Chlorophyceae, Xanthophyceae and Bryophytes (Mosses) of India have been completed. Besides Palynotaxonomic studies on families Nyctaginaceae and Thymelaeaceae of India have also been completed. Apart from that, work on the families Gramineae (Genus *Festuca*), Compositeae (Tribe *Vernonieae* & Tribe *Heliantheae*), Bignoniaceae, and Memecylaceae have been started and will be completed by 12<sup>th</sup> Five Year plan period.

### Regional/State/District Flora

Completed documentation of Aphyllorales of North Western Himalaya; Pteridophytic Flora of Western Himalaya; Seaweeds of South East Coast of India; Flora of Cold Deserts of North West Himalayas (Vol. II); Flora of Jammu & Kashmir (Vols. II, III & IV); Flora of Kerala (Vol. II); Flora of Little Nicobar Islands; Flora of Manipur (Vol. II); Flora of Mizoram (Vols. II & III); Flora of Nagaland (Vols. I & IV); Flora of Uttar Pradesh (Vols. I, II & III); Flora of Upper Siang District, Arunachal Pradesh; Ericaceae of Arunachal Pradesh; E - Flora of National Capital Territory of Delhi & its environs; Herbaceous Flora of Meghalaya; Bamboos of Meghalaya; Hepaticae and Anthocerotae of East Sikkim; Epiphyllous Liverworts of Eastern Himalaya and Gasteromycetes (Lycoperdales & related

fungi) of Uttarakhand. Besides, editing of Flora of West Bengal (Vols. II, III & IV); Flora of Karnataka (Monocotyledons) and Moss Flora of Tawang District, Arunachal Pradesh have also been completed. Apart from that, documentation of Flora of Gujarat (Vol. III); Flora of Uttarakhand (Vols. II & III); Alpine & Sub-Alpine Flora of Central Arunachal Pradesh; Flora of Anjaw District, Arunachal Pradesh and Flora of West Siang District, Arunachal Pradesh started during 11th Five year plan period will be completed by 12th Five year plan period.

### Protected Areas

Exploration and Documentation of Plant Diversity of 14 protected areas have been fully completed. These are Ballavpur Wildlife Sanctuary (West Bengal); Chakrasila Wildlife Sanctuary (Assam), Dalma Wildlife Sanctuary (Jharkhand); Dampa Tiger Reserve (Mizoram); Fumbonglho Wildlife Sanctuary (Sikkim); Kyangnolsa Alpine Sanctuary (Sikkim); Maenam Wildlife Sanctuary (Sikkim); Mahananda Wildlife Sanctuary (West Bengal); Mehao Wildlife Sanctuary (Arunachal Pradesh); Mookambika Wildlife Sanctuary (Karnataka); Narendrapur Wildlife Sanctuary (West Bengal); Parasnath Wildlife Sanctuary (Jharkhand); Senchal Wildlife Sanctuary (West Bengal) and Tendong Reserve Forest (Sikkim). In addition, exploration and documentation of plant diversity in 24 protected areas have been completed partly. These are Bakhira Bird Sanctuary (Uttar Pradesh); Bethuadaharai Wildlife Sanctuary (West Bengal); Bondla Wildlife Sanctuary (North Goa); Buxa National Park (West Bengal); Chambal Wildlife Sanctuary (Uttar Pradesh); Cotigaon Wildlife Sanctuary (South Goa); Darrah Wildlife Sanctuary (Rajasthan); Dihang Dibang Biosphere Reserve (Arunachal Pradesh); Gibbon Wildlife Sanctuary (Assam); Gorumara National Park (West Bengal); Govind Pashu Vihar National Park (Uttarakhand); Interview Island Wildlife Sanctuary (Andaman & Nicobar Islands);

Katerniaghat Wildlife Sanctuary (Uttar Pradesh); Little Nicobar Islands Wildlife Sanctuary (Andaman & Nicobar Islands); Madei Wildlife Sanctuary (Goa); Netravali Wildlife Sanctuary (Goa); Pabha Wildlife Sanctuary (Assam); Pani-Dihing Wildlife Sanctuary (Assam); Rajgir Wildlife Sanctuary (Jharkhand); Ranipur Wildlife Sanctuary (Uttar Pradesh); Salim Ali Wildlife Sanctuary (Goa); Shingba Rhododendron Wildlife Sanctuary (Sikkim); Sohelwa Wildlife Sanctuary (Uttar Pradesh) & Wayanad Wildlife Sanctuary (Kerala). Apart from that, exploration and documentation of plant diversity in 11 protected areas have been started and will be completed by 12<sup>th</sup> Five Year Plan period. These are Barnadi Wildlife Sanctuary (Assam); Buxa Wildlife Sanctuary, (West Bengal); Great Indian Bustard Wildlife Sanctuary (Maharashtra); Jamwa Ramgarh Wildlife Sanctuary (Rajasthan); Koderma Wildlife Sanctuary (Jharkhand); Koyna Wildlife Sanctuary (Maharashtra); Palkot Wildlife Sanctuary (Jharkhand); Phawngpui Blue Mountain Peak National Park (Mizoram); Rani Jhansi Marine National Park (South Andaman); Srivilliputhur Wildlife Sanctuary (Tamil Nadu) and Talle Valley Wildlife Sanctuary (Arunachal Pradesh)

### New Discoveries

During this period, the Scientists of BSI discovered, two genera 117 species, one subspecies & 21 varieties as new to science and 142 species, three subspecies and nine varieties (including three genera) as new records for India.

### Documentation of Traditional Knowledge of Plants

Twelve tours were undertaken to Sundergarh, Phulbani, Rayagada, Mayurbhanj, Jharsuguda, Angul, Bolangiri, Gajapati & Kandhamal districts of Orissa by scientists of CBL, Howrah and ethnobotanical uses of more than 1050 species were recorded. Apart from that, three tours were



Fig-4. *Larsenianthus arunachalensis* is narrowly endemic to Arunachal Pradesh due to various anthropogenic activities.

undertaken to Junagarh district of Gujarat by Scientists of Arid Zone Regional Centre, Jodhpur and ethnobotanical uses of ca.186 species were recorded.

#### Ex situ Conservation

Fifty four threatened, 42 medicinal/economically important and 73 ornamental plant species were introduced for acclimatization and multiplication in the Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah, Botanic Garden of Indian Republic, NOIDA and Associated Botanic Gardens of different Regional Centers of BSI.

#### Digitization

About 15350 samples

of Textile designs, Natural dyes & Botanical illustrations and 60,000 archival documents, manuscripts Correspondences and Watt's Ledger have been digitized through photography and scanning respectively under the project "Conservation, Restoration and Digitization of the Old Archival Documents/ Correspondences/Manuscripts & Herbarium Specimens at ISIM, Kolkata" funded by MoEF. Besides, barcoding and digitization of 14,475 type specimens of Central National Herbarium (CAL) have also been completed under the project "Development of Indian Virtual Herbarium and Digital Herbarium" funded by MoEF. In addition, barcoding and digitization of 3,323 specimens of medicinal plants were also completed under a digitization project funded by Patanjali Ashram, Haridwar.

#### Botanical Exploration and Inventorisation of Phytodiversity

#### Field tours and Herbarium consultation tours

Sixty-five field tours were undertaken for floristic/ethnobotanical studies on flowering and non-flowering plants by different regional

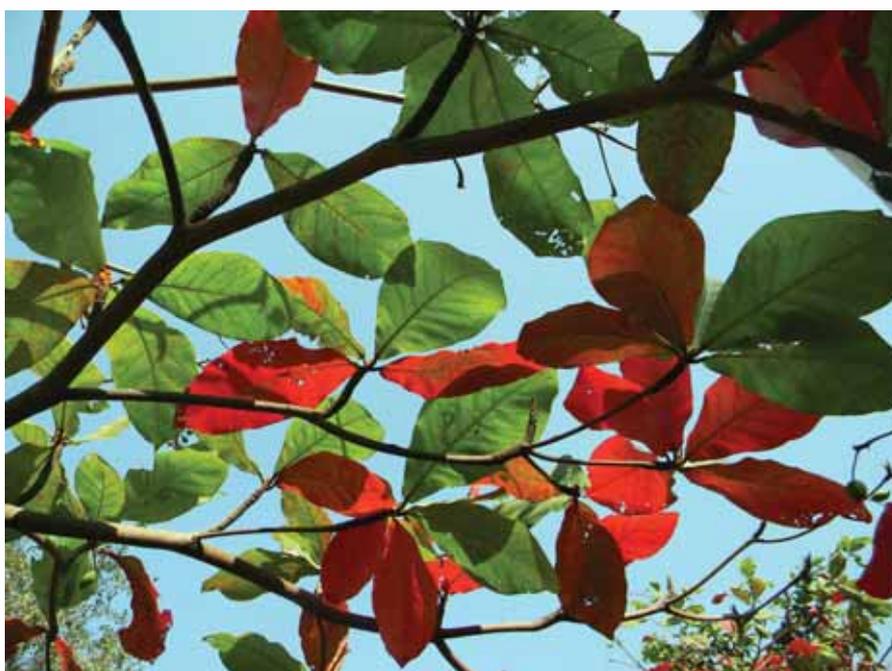


Fig-5. Colours in nature

centres and units of BSI covering the following areas:

- Western Himalaya: Tropical and Subtropical Zones of Siwaliks; Bageshwar-Almora, Sunderdunga Glacier; Ladakh (*Kargil, Zauskar valley*), Tangling (*Kinnaur*), Palampur, Malan (*Mandi*), Rohlang and Kullu (*Kullu District*), Kala top and Banikhet (*Chamba*) in Himachal Pradesh and Pithoragarh District;
- Eastern Himalaya: Sikkim (*Shingba Rhododendron Sanctuary, Yumthang, Zero point, Lachung, Bansoi, Dombang, Dombang Valley, Katau, Maenam Wildlife Sanctuary, Ralung, Ravangla, Pharmthang, Pullbazar, 10thMile.*)
- North - East India: Arunachal Pradesh (*Kurum Kumey, Anjaw, Anini and West Siang districts.*), Assam (*Gibbon Wildlife Sanctuary, Pani Dihing Wildlife Sanctuary, Pabha Wildlife Sanctuary, Barnadi Wildlife Sanctuary*), Mizoram (*Phawangpui Blue Mountain Peak and Pualreng Wildlife Sanctuary*), Meghalaya (*East and West Garo Hills districts*)
- Arid - Semi Arid: Gujarat (*Rajkot, Bhavnagar, Patan and Junagarh districts*); Rajasthan (*Darrah Wildlife Sanctuary, Jamwa Ramgarh Wildlife Sanctuary*)
- Gangetic Plains: Uttar Pradesh (*Ranipur Wildlife Sanctuary, Katerniyaghat Wildlife Sanctuary, Chambal Wildlife Sanctuary*), Jharkhand (*Dalma Wildlife Sanctuary, Koderma Wildlife Sanctuary, Palot Wildlife Sanctuary*), West Bengal (*Buxa National Park, Gorumara National Park, Bethuadahari Wild Life Sanctuary*)
- Deccan Peninsula: Madhya Pradesh (*Govindsagar Dam, Halali Dam, Mod Dam, Upper Lake*)



Fig-6. *Commelina forsskalii*, commonly known as Dayflower

- Western Ghats: K a r n a t a k a (*Mookambika Wildlife Sanctuary*), Goa (*Netravali, Cotigaon, Madei-Bondla Wildlife Sanctuaries* and *Dr. Salim Ali Bird Sanctuary*), Maharashtra (*Great Indian Bustard Wildlife Sanctuary*); Tamil Nadu (*Srivilliputhur Wildlife Sanctuary*)
- A & N Islands: South Andaman (*Tirur, Beadnabad, Manpur, Collinpur, Chidiyatapu, Mount Harriet National Park and Wandoor*) & Nicobar (*Little Nicobar*)

During these field tours, ca 8675 specimens have been collected. 5540 of these collected specimens belonging to ca 782 species were identified by scientists of different regional Centres and units which resulted in discovery of one genus and five species as new to science and nine species as new to India. Three species have been collected after 50 years.

#### Genus new to Science

- *Devendraea* Pusalkar, gen. nov. (Caprifoliaceae)

#### Species new to science

- *Crawfordia arunachalensis* S.S. Dash, R. Gagoi & A.A. Mao [Campanulaceae]



Fig-7. *Tamilnadia uliginosa*, popularly known as Divine Jasmine

- *Graphidastra himalayana* Jagdeesh & G. P. Sinha [Lichen]
- *Herpathallon sticticum* Jagdeesh & G. P. Sinha [Lichen]
- *Lasianthus chowdheryi* Karthig., Jayanthi & Sumathi [Rubiaceae]
- *Tylophora nicobarica* Murugan & M.Y. Kamble [Asclepiadaceae]

#### New Records for India

- *Arnebia linearifolia* A.DC. [Boraginaceae]
- *Corydalis meifolia* Wall. var. *violacea* Prain [Fumariaceae]
- *Arnebia euchroma* (Royle) I.M. Johnst. var. *grandis* (Bornm.) Kazmi [Boraginaceae]
- *Globba wardii* Burt & Smith [Zingiberaceae]
- *Bridelia moonii* Thwaites [Euphorbiaceae]
- *Alpinia luteo-carpa* Elmer [Zingiberaceae]
- *Memecylon minutiflorum* Miq. [Memecylaceae]
- *Leratiomyces squamosus* var. *thraustus* (Kalchbr.) [Fungi]

- *Plagiocchila hyalodermica* Grolle & M.L.So. [Bryophyte]

#### New Records for State

- *Trisetum micans* (Hook.f.) Bor from Jammu and Kashmir

#### Species Collected after 50 years or more

- *Isotachis indica* Mitt. [Hepaticae]
- *Rochelia laxa* I.M. Johnst. [Boraginaceae]
- *Codonopsis javanica* (Blume) Hook.f. & Thoms. [Campanulaceae]

#### National Flora (Flora of India)

- Taxonomic description of 65 species of Family Rocellaceae, Tribe *Vernonieae*, Family Bignoniaceae, Genus *Athyrium*, Family Pertusariaceae, Genus *Festuca*, Genus *Kobresia*, tribe Heliantheae, Family *Memecylaceae* completed
- Palynotaxonomic Studies on 80 species of Lauraceae of India completed

#### Regional/State Flora

- Taxonomic description of 754 species towards (1) Flora of Uttarakhand and (2) Flora of Gujarat completed.
- Taxonomic description of 124 species for Endemic and Threatened Pteridophytes of North West Himalaya, 45 species of Macrofungi of Siwalik Himalaya, 24 species of Aspidiaceae of north East India and 17 species of Bryoflora of Mizoram completed.
- Manuscript of 'Ericaceae of Arunachal Pradesh' comprising 213 taxa with over 100 photographs and manuscript of 'State Flora of Sikkim, Volume 2 (six families and 170 species) have been completed and submitted for publication.

## Protected Areas

- Taxonomic description of 346 species towards Flora of Gibbon Wildlife Sanctuary, Pani Dihing Wildlife Sanctuary, Pabha Wildlife Sanctuary, Ranipur Wildlife Sanctuary Chambal Wildlife Sanctuary, Jamwa Ramgarh Wildlife Sanctuary, Darrah Wildlife Sanctuary, Cotigao Wildlife Sanctuary, Netravali Wildlife Sanctuary, Great Indian Bustard Wildlife Sanctuary, Koyna Wildlife Sanctuary, Dalma Wildlife Sanctuary, Koderma Wildlife Sanctuary and Palkot Wildlife Sanctuary have been completed.



Fig-8. Purple Smithia (*Smithia purpurea*) is a small annual herb endemic to North-Western Ghat

## Documentation of Indigenous Knowledge of Plant Resources

- During this period two field tours to Bargarh and Balangir districts of Odisha were undertaken and 116 plants with information on 200 ethnobotanical uses collected. In addition to this, one ethnobotanical tour to Junagarh has been conducted and 660 specimens along with relevant ethnobotanical data were also collected.

## Studies of Nutritional Values of Wild Edible Plants of Meghalaya

- One tour was undertaken to the different parts of Meghalaya (Shillong, Soharim, Mawphlang, Laitkynsew, Mawryngkneng, Jowai, Laitlyngkot) from 01<sup>st</sup> August, 2011 to 10<sup>th</sup> August, 2011. Following eighteen plant specimens (different edible parts) were collected



Fig-9. Bamboo shoots, one of the most delicious and rich vegetable

and also procured from different tribal market to carry out the Phytochemical studies. Colour photographs of live plants were also taken.

*Zanthoxylum armatum* (leaves); *Gomphogyne cissiformis*; *Allium schoenoprasum*; *Solanum kurjii*; *Carica papaya*; *Allium porrum*; *Carpesium cernuum*; *Tricyrtis pillosa*; *Spilanthes acmella*; *Leea sambucina*; *Neptunia olearacea*; *Eurya acuminata*; *Gymnopetalum cochinchinensis*; *Hodgsonia heteroclita*; *Atrocarpus gomeziana*;



Fig-10. Daisy Fleabeane, (*Erigeron bellidioides*) flowers in full bloom

*Brassica*; *Flacourtia jangomas*;  
*Baccaurea sapida*

### Ex-situ Conservation in Botanic Gardens

- Eighty nine rare plants collected from Assam, Meghalaya and Andaman & Nicobar Islands have been introduced in Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah
- Twenty three rare and endangered species have been introduced in the other associated botanic gardens of different Regional Centres of BSI

### Monitoring of Botanic Gardens

- During the period BSI monitored the status of implementation of "Assistance to Botanic Gardens Scheme" towards conservation of threatened species in the following two botanical gardens funded

by MoEF.

- Botanic Garden of Kolkata Wildlife Society, Kolkata
- Botanic garden of Vinobha Bhave University, Hazaribagh, Bihar
- Five proposals, received for funding under 'Assistance to Botanic Garden' scheme of MoEF.

### Miscellaneous

#### Public Services rendered

- BSI disseminated scientific information to public and also assisted scientists, students and researchers in their pursuit of taxonomic research on plants. During the period scientists, students and visitors, including 19 VIPs, have visited the Botanic Gardens, Herbaria and Museums of BSI; 185 requests for information and supply of plant materials have been attended.

Identified 180 plant materials and supplied 1125 pages of photocopied literature.

### Maintenance and enrichment of Herbaria in Botanical Survey of India

- During the period 1258 specimens were mounted and 8,789 herbarium specimens were remounted. 20,359 herbarium sheets were dusted and fumigated. 14,268 herbarium sheets have been poisoned and 4,569 sheets have been incorporated in different herbaria of BSI.

### Publications

During the period BSI published the following books and Journals:

- *Bulletin of BSI (Nelumbo)*, Vol.: 53; *Vanaspati Vani*, Vol. 20; *Plant Discoveries 2010*; *Vanaspati Anveshan 2010*. Scientists of BSI have also published more than 115 research papers in different peer reviewed journals in India and outside during the period.

### Visit of Parliamentary Committees

- The Parliamentary Committee on Official language reviewed the status of implementation of official language in Sikkim Himalayan Regional Centre, Gangtok on 13<sup>th</sup> May, 2011.

### Revenue earnings

- During the period BSI earned Rs.20,18,025/- through (1) Entry Fee, Car Parking and Outsourcing of Boating and Battery Driven Vehicle in AJC Bose Indian Botanic Garden, Howrah, (2) Sale of departmental publications and (3) identification of plant specimens and supply of photocopied literature, etc.

### Implementing Organisation with details of Responsibilities

- **Headquarters:** Pharmacognosy, Cryptogamy, Ecology, Plant Chemistry, Flora Cell, Palynology and Library at Howrah; Publication Unit & Technical Section at Kolkata.

### Current Projects

#### Pharmacognosy Unit

- Pharmacognostic studies on medicinal Aconites of India
- Pharmacognostic studies on the selected plants of the Negative List of Export

#### Cryptogamic Unit

- A Checklist of Xanthophyceae in India
- Dicot Flora of Dihang Dibang Biosphere Reserve, Arunachal Pradesh
- Liverwort & Hornwort Flora of Sikkim
- Moss Flora of Darjeeling District, West Bengal
- Moss Flora of Tawang District, Arunachal Pradesh

#### Ecology Unit

- A Checklist of Dinophyceae in India



Fig-11. *Viola* sp. a flowering plant mostly found at higher altitudes

**Table-1.** State-wise status of projects undergoing during 2011

Name of State/UT	Status
Andaman & Nicobar Islands	<ol style="list-style-type: none"> <li>1. Flora of Little Nicobar Island - Manuscript Submitted</li> <li>2. Flora of North Andaman Islands (Narcondam, Peacock, Paget, Landfall)</li> <li>3. Flora of Rani Jhansi National Park</li> <li>4. Follicolous lichens of Andaman Islands</li> </ol>
Andhra Pradesh	Flora of Greater Hyderabad
Arunachal Pradesh	<ol style="list-style-type: none"> <li>1. Alpine and Sub-Alpine Flora of Central Arunachal Pradesh</li> <li>2. Family Ericaceae of Arunachal Pradesh</li> <li>3. Flora of Anjaw District</li> <li>4. Flora of West Siang District</li> <li>5. Hepaticae and Anthocerotae of Anjaw District</li> <li>6. Liverworts and Hornworts of West Siang District</li> </ol>
Assam	<ol style="list-style-type: none"> <li>1. Flora of Barnadi Wildlife Sanctuary</li> <li>2. Flora of Gibbon Wildlife Sanctuary</li> <li>3. Flora of Pabha Wildlife Sanctuary</li> <li>4. Flora of Panidihing Wildlife Sanctuary</li> </ol>
Bihar	Wetland Flora of Gangetic Plains in Bihar
Goa	<ol style="list-style-type: none"> <li>1. Flora of Cotigaon Wildlife Sanctuary, South Goa</li> <li>2. Flora of Netravali Wildlife Sanctuary, South Goa</li> </ol>
Gujarat	<ol style="list-style-type: none"> <li>1. Ethnobotany of Junagarh District</li> <li>2. Flora of Gujarat, Vol. III</li> </ol>
Jammu & Kashmir	<ol style="list-style-type: none"> <li>1. Endemic &amp; Threatened Pteridophytic Flora of NW Himalayas</li> <li>2. Flora of Cold Desert of NW Himalaya</li> <li>3. Flora of Jammu &amp; Kashmir, Volume V</li> </ol>
Jharkhand	<ol style="list-style-type: none"> <li>1. Application of Remote Sensing and GIS: A Case study in Dalma Sanctuary</li> <li>2. Flora of Koderma Wildlife Sanctuary</li> <li>3. Flora of Palkot Wildlife Sanctuary</li> <li>4. Wood Rotting Fungi of Koderma Wildlife Sanctuary</li> </ol>
Kerala	<ol style="list-style-type: none"> <li>1. Flora of Kerala, Volume V</li> <li>2. Seaweed Survey of Kerala Coast</li> </ol>
Maharashtra	<ol style="list-style-type: none"> <li>1. Ferns of Maharashtra</li> <li>2. Flora of Great Indian Bustard Wildlife Sanctuary</li> <li>3. Flora of Koyna Wildlife Sanctuary</li> <li>4. Follicolous Fungi of Maharashtra</li> </ol>
Meghalaya	Chemical composition and nutritive value of Wild Edible Plants of Meghalaya
Mizoram	<ol style="list-style-type: none"> <li>1. Bryoflora (Hepaticae &amp; Anthocerotae) of Mizoram</li> <li>2. Flora of Phawangpui Blue Mountain Peak, Mizoram</li> </ol>

Name of State/UT	Status
Orissa	1. Ethnobotany of Orissa 2. Poaceae of Orissa
Rajasthan	1. Flora of Darrah Wildlife Sanctuary 2. Flora of Jamwa Ramgarh Wildlife Sanctuary
Sikkim	1. Liverwort & Hornwort Flora of Sikkim 2. Microlichens of Sikkim 3. Pteridophytic Flora of North Sikkim 4. Studies on Russulales of West Sikkim 5. Studies on Wild Mushrooms of North Sikkim
Tamil Nadu	1. Flora of Srivilliputhur Wildlife Sanctuary
Uttar Pradesh	1. Flora of Chambal Wildlife Sanctuary 2. Flora of Nawabganj Birds Sanctuary 3. Flora of Ranipur Wildlife Sanctuary
Uttarakhand	1. Flora of Uttarakhand 2. Macrofungal flora of Siwalik Himalayas
West Bengal	1. Flora of Bethuadaharai Wildlife Sanctuary 2. Flora of Buxa National Park 3. Flora of Buxa Wildlife Sanctuary 4. Flora of Gorumara National Park 5. Flora of West Bengal, Volume V 6. Moss Flora of Darjeeling District

### Plant Chemistry Unit

- Chemical Composition and Nutritive Value of Wild Edible Plants of Meghalaya
- **Indian Botanic Garden, Howrah:** Established in 1787 at Howrah, the IBG has an area of ca 273 acres with a National Orchidarium, 25 Lakes and number of conservatories. Initially served as platform for introduction of such

- commercially important plants, as cardamom, pepper, nutmeg, cotton, tobacco, indigo, coffee, sago, teak, cinchona, rubber, jute, mahogany, etc.,
- Has 2132 species under cultivation including (two living types and) 1092 exotics.
  - Every year over five lakh people visit the garden for education, awareness and recreation purposes.

**Table-2.** Budget Allocation

(Rs. in Thousand)

Plan				Non Plan			
BE	RE	Expenditure Upto	%	BE	RE	Expenditure Upto	%
2011-12	2011-12	29.02.2012		2011-12	2011-12	29.02.2012	
150000	165000	124147	75.24	257800	228500	223888	97.98

- **Central Botanical Laboratory, Howrah:** Established in 1954 at Kolkata and later shifted to Howrah with Economic Botany, Cytology & Plant physiology section.

#### Current Projects

- Ethnobotany of Odisha state
- Revision of the Family *Memecylaceae* in India
- **Industrial Section, Indian Museum, Kolkata:** Established in 1887 at Kolkata has 20,000 exhibits of economic plants and plant products arranged in eight Bays for public awareness; 70,000 herbarium specimens; 18 volumes containing 700 samples of Indian textiles in silk, cotton, muslin and wool, representing one of the 20 sets captioned Textiles Manufactures and Costumes of the People of India, and a 15 volume companion set on Natural Dyes.
- **Central National Herbarium, Howrah:** Established in 1795 at Howrah, holds ca 2.05 million specimens of seed plants, 10,000 type specimens, 12,000 Wallichian specimens and 10,000 non-flowering plants. The unit has been responsible for discovery of nine genera and 235 species new to science.

#### Current Projects

- Flora of Buxa National Park, Jalpaiguri, West Bengal
- Flora of Dalma Wildlife Sanctuary, Jharkhand
- Flora of Gorumara National Park, Jalpaiguri, West Bengal
- Flora of Koderma Wildlife Sanctuary (Jharkhand)
- Flora of Palkot Wildlife Sanctuary (Jharkhand)
- Flora of West Bengal, Vols. IV & V
- Palynological studies on Thymelaeaceae

- Palynotaxonomic studies of Lauraceae of India
- Revision of the Genera *Carex* L. and *Kobresia* Willd. in India
- Revision of the Genus *Festuca* in India
- Revision of the Tribe *Vernonieae* in India
- Alpine and Sub-Alpine Flora of Central Arunachal Pradesh
- Wood Rotting Fungi of Koderma Wildlife Sanctuary (Jharkhand)

- **Arunachal Pradesh Regional Centre, Itanagar:** Jurisdiction - Arunachal Pradesh. Established in 1977, the circle has 13,500 herbarium specimens, including 34 types representing 20 species discovered as new to science. The associated garden of 48 ha at Sankie View has ca 400 species under cultivation.

#### Current Projects

- Flora of Anjaw District, Arunachal Pradesh
- Flora of Kurung-Kumey district, Arunachal Pradesh
- Flora of West Siang District, Arunachal Pradesh
- Hepaticae and Anthocerotae of Anjaw District
- Liverworts and Hornworts of West Siang District
- Monocot Flora of Dihang Dibang Biosphere Reserve, Arunachal Pradesh
- Revision of the Family *Ericaceae* of Arunachal Pradesh
- Revision of Family *Aspidiaceae* in N.E. India
- **Eastern Regional Centre, Shillong:** Jurisdiction - Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura. Established in 1956 at Shillong,

the circle has ca 2,71,000 herbarium specimens, including 508 types representing five genera and 89 species discovered as new to science. The associated garden of 10 ha at Barapani has ca 800 species under cultivation.

### Current Projects

- Bryoflora (*Hepaticae & Anthocerotae*) of Mizoram
- Flora of Gibbon Wildlife Sanctuary, Assam
- Flora of Pani-Dihing Wildlife Sanctuary, Assam
- Flora of Pabha Wildlife Sanctuary, Assam
- Micropropagation of RET plants of NE India (*Nymphaea & Cymbidium*)
- Multiplication and conservation of Rare/Endangered/Economically important plants in Botanic Garden of BSI-ERC.
- **Sikkim Himalayan Regional Centre, Gangtok:** Jurisdiction - Sikkim. Established in 1979, the circle has 40,000 herbarium specimens, including six types representing six species discovered as new to science. The associated garden in the campus has ca 200 species, mostly orchids, under cultivation.

### Current Projects

- Studies on Russulales of Sikkim Himalayas: Part I - West Sikkim
- Pteridophytic Flora of Sikkim
- Flora of India: Rubiaceae
- State Flora of Sikkim, Vol. II *Saxifragaceae & Crassulaceae*
- **Central Regional Centre, Allahabad:** Jurisdiction - Madhya Pradesh, Chhattisgarh, Uttar Pradesh. Established in 1962 at Allahabad, the circle has ca 69,000 herbarium specimens, including three types.

Seventeen species and seven varieties have been described as new to science from here. The associated garden of two ha in the campus has ca 570 species under cultivation.

### Current Projects

- Flora of Chambal Wildlife Sanctuary, Uttar Pradesh
- Flora of Katarniaghat Wildlife Sanctuary, Uttar Pradesh
- Flora of Ranipur Wildlife Sanctuary, Uttar Pradesh
- Microlichens of Sikkim
- Revision of Family *Rocellaceae* in India
- Revision of the tribe *Heliantheae* in India
- Studies on Family *Pertusariaceae* in India
- **Botanic Garden of Indian Republic, NOIDA:** Jurisdiction - National Capital Territory Region of Delhi. 4300 indigenous saplings and 554 seedlings of medicinal plants have been procured different parts of Terai region and Orissa for BGIR. Database on Oil Yielding Plants completed; hard copy format published (2008). Seeds Database initiated.
- **Northern Regional Centre, Dehradun:** Uttarakhand, Chandigarh, Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir. Established in 1956 at Dehradun, the circle has ca 1, 21,500 herbarium specimens, including 112 types representing two genera and 66 species discovered as new to science. The associated gardens of 23 ha at Dehradun, Pauri and Khirsu have ca 500 species under cultivation.

### Current Projects

- Endemic & Threatened Pteridophytic Flora of North Western Himalayas

- Flora of Govind Pashu Vihar National Park
- Flora of Jammu & Kashmir, Vols. IV & V
- Flora of Uttarakhand, Vols. III & IV
- Macrofungal flora of Siwalik Himalayas
- Revision of the Family Bignoniaceae in India
- Revision of the Genus *Athyrium* in India
- Revisionary Studies on Genera *Pyrrosia* Mirbel and *Phymatopteris* Pic.-Ser. in India
- **Arid Zone Regional Centre, Jodhpur:** Jurisdiction - Rajasthan, Gujarat. Established in 1972 at Jodhpur, the circle has ca 24,800 herbarium specimens, including 17 types representing nine species discovered as new to science. The associated garden of six acres in the campus has ca 185 species under cultivation.

#### Current Projects

- Flora of Darrah Wildlife Sanctuary, Rajasthan
- Flora of Gujarat, Vol. III
- Floristic Survey of Rajkot, Bhavnagar & Patan districts, Gujarat
- Ethnobotany of Gujarat (Junagarh District)
- **Western Regional Centre, Pune:** Jurisdiction - Maharashtra, Karnataka, Goa, Daman, Diu, Dadra & Nagar Haveli. Established in 1955 at Pune, the circle has ca 1,70,000 herbarium specimens, including 571 types representing two genera and 146 species discovered as new to science. The associated gardens of 19.5 ha at Mundhwa and in the campus have ca 400 species under cultivation.

#### Current Projects

- Flora of Cotigaon Wildlife Sanctuary, South Goa
- Flora of Netravali Wildlife Sanctuary, South Goa
- Flora of Madei, Bondla and Dr. Salim Ali Wildlife Sanctuary, North Goa
- Flora of Great Indian Bustard Wildlife Sanctuary, Ahmednagar, Maharashtra
- Ferns of Maharashtra
- Collection of Red listed/endemic plants for Mundhwa Garden and Office Campus
- **Deccan Regional Centre, Hyderabad:** Jurisdiction - Andhra Pradesh, Orissa. Established in 2005 at Hyderabad, the circle has ca 10,000 herbarium specimens.

#### Current Projects

- Floral Inventorying of the areas in and around Hyderabad
- Poaceae of Odisha State
- **Southern Regional Centre, Coimbatore:** Jurisdiction - Tamil Nadu, Kerala & Lakshadweep Islands. Established in 1955 at Coimbatore, the circle has ca 2,75,000 herbarium specimens, including 2594 types representing 08 genera and 155 species discovered as new to science. The associated garden of 19 ha at Yercaud and in the campus has ca 1100 species under cultivation

#### Current Projects

- Flora of Wayanad Wildlife Sanctuary, Kerala
- Seaweed survey of South East Coast of India.
- Floristic Survey of Sathyamangalam Forests

- Flora of Kerala, Vols. III, IV & V
- *Lamiaceae* under Flora of India
- Floristic Survey of Vellingiri, Siruvani & Anaikatti hills
- Introduction & multiplication of orchids in Associated Botanic Garden, Yercaud.
- **Andaman & Nicobar Regional Centre, Port Blair:** Jurisdiction - Andaman & Nicobar Islands. Established in 1972, the circle has 22,000 herbarium specimens, including 100 types representing two genera and 66 species discovered as new to science. The associated garden of 30 ha at Dhanikheri has ca 200 species under cultivation.

#### Current Project

- Flora of Little Nicobar Island
- Flora of Interview Island Wildlife Sanctuary
- Survey of Narcondum and other unexplored North Andaman Islands

## Survey of Fauna

### Zoological Survey of India

#### Introduction and Objectives

The Zoological Survey of India (ZSI), a premier institution under the Ministry, has been undertaking survey, exploration and research leading to the advancement of our knowledge on the exceptionally rich faunal diversity of the country since its inception in 1916. With its headquarters at Kolkata and 16 Regional Centers located at different parts of the country, ZSI in recent years re-oriented its plan of work by grouping the survey and studies under the following six major programmes :

- Fauna of States
- Fauna of Conservation Areas
- Fauna of Important Ecosystems
- Status Survey of Endangered Species

- Ecological Studies/Environment Impact Assessment Survey, and
- Computerization and Dissemination of Data

#### Primary Objectives

The current mandate of ZSI is survey, collection documentation (including the traditional knowledge associated with animals) and *ex situ* conservation of wild animal diversity of the country.

#### High priority areas include

- Digitization of present collections, preparation of fine scale distribution maps based on primary occurrence data and making it available in a searchable format.
- Publication of National and State faunas.
- Taxonomic studies, revisionary/monographic studies on selected animal groups.
- Identification of Red list species and species rich areas needing conservation and focus on data deficient species to collect more information on populations.
- Development of National database of Indian animals including Museum specimens, live specimens, paintings, illustrations etc. and maintenance of already existing collections with modern facilities and as per international standards of collection management.
- Developing and maintaining Museums and using such facilities for conservation education for people especially students.
- *Ex situ* conservation of critically threatened taxa.
- Capacity building in taxonomy, nomenclature, specimen collection, preservation and maintenance through training programmes.

#### Secondary Objectives

- To establish a panel of experienced and active taxonomists and obtain their



Fig-12. *Cervus unicolor* or Sambar

- consent to participate in fauna project.
- To prepare annotated checklist of different groups of animals, museum collections, based on published documents giving local names if any with locality and habitat. Make available the electronic version of checklist to the general public; and circulate it among the panel of zoologists who would, in turn, check for omissions, ambiguities, localities and habitat through active consultation with other local zoologists.
- To begin with, state faunas should be published electronically giving correct names, localities, habitats, sketches and photographs of important species on an interactive Fauna of India Website. This will act as an outreach programme for all the biologists, and other interested public.

#### Activities undertaken during the year

- One Hundred and Twenty four extensive faunal surveys are being undertaken to different States / UT's including important ecosystems and some selected conservation / protected areas.
- Eleven status /ecological survey namely exploration of Hamilton species of fishes,

Rock toad, (*Bufoids meghalayana*), Hill Myna (*Gracula religiosa*), Chinkara and Desert cat, Non-human primates, Goral (*Nemorhaedus goral*), four horned antelope (*Tetracerus quadricornis*), Serow (*Nemorhaedus sumatraensis*), Indian Golden Gecko (*Calodactyloides aureus*) and Coral reefs and associated organisms in Palk Bay were carried out.

- One survey related to documentary work on mass migration of earthworms, one on ecological and molecular studies of turtles and one survey on physico-chemical parameter of sea water samples of adjoining coasts of Adyar river were carried out.
- Seven short and long duration intensive surveys for ecological and behavioral studies were also undertaken.
- Detailed taxonomic studies were carried out on the material collected during the present year and earlier surveys.
- The National Zoological collections were further enriched by the addition of 13929 example of specimens (Unnamed) and 19010 identified specimens belonging to 793 species.
- Identification and Advisory services were rendered to 115 individual/institution in India and abroad. The training courses were also organized under training and extension programme.
- Totally 10,000 specimens of identified species were digitized so for.

#### Faunal explorations and surveys

##### Wetland ecosystem

A total of twenty extensive surveys, five in Palair lake, Osman and Himayat Sagar from Andhra Pradesh, one in Damodar river from Jharkhand, one in Ganga river from

Uttarakhand, one in Cumbum Lake from Andhra Pradesh, two in Wyra Lake from Andhra Pradesh, one in West and East Khasi Hills from Meghalaya, two in Attapur lake from Andhra Pradesh, one in Pallikarani Marsh from Tamil Nadu, one in Meda from Maharashtra and one from Mawlyngot from Manipur and five surveys from South Andaman were also undertaken.

### Estuarine ecosystem

One survey was undertaken to Pennar estuary from Orissa.

### Marine/Island ecosystem

Ten extensive surveys one to Digha coast, Three to Chennai coast and two to Gulf of Mannar and Palk Bay from Tamil Nadu and four from Andaman.

### Biosphere Reserve / Conservation areas

Ten surveys, four to Sunderban, five to Jhilmil Jheel from Uttarakhand and one to Amboli reserve forest from Maharashtra were undertaken during the year.

### National Parks

Two surveys, One to Mahatma Gandhi National park and one survey to Saddle peak National park from Andaman.

### Wildlife Sanctuaries

Twelve surveys, one to Nannaj from Maharashtra, two to Singhori from Madhya Pradesh, one each to Kalatop-Khajjar and Chail from Himachal Pradesh, Bhimashankar from Maharashtra, Barnawapara from Chhatisgarh, Veerangana Durgavati from Madhya Pradesh, Lohabarrack Crocodile from Andaman, Koyna from Maharashtra, Malabar from Kerala and Dugong from Andaman.

### Tiger Reserves

Three surveys, one to Pakke from Arunachal Pradesh, two surveys to Sajnekhali from West Bengal.

### States and Union territories

Under the state fauna programme twenty one surveys in several districts of Andhra Pradesh, Himachal Pradesh, Karnataka,



Fig-13. *Crocodylus paluster* or Mugger Crocodile



Fig-14. *Gazella bennettii* or Chinkara

Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Uttarakhand, Uttar Pradesh and West Bengal were carried out.

#### Ecological / Status Survey

Totally eleven status/ecological survey namely exploration of Hamilton species of fishes, Rock toad, (*Bufoids meghalayana*), Hill Myna (*Gracula religiosa*), Chinkara and Desert cat, Non-human primates, Goral (*Nemorhaedus goral*), four horned antelope (*Tetracerus quadricornis*), Serow (*Nemorhaedus sumatraensis*), Indian Golden Gecko (*Calodactyloides aureus*) and Coral reefs and associated organisms in Palk Bay were carried out.

#### Some Important Research studies undertaken

- Survey and monitoring the health of coral reefs of India (sponsored by MoEF).
- Diversity and distribution of coral and their associated fauna of Rani Jhansi Marine National Park (sponsored by MoEF).
- GIS based mapping and analysis of ecological variables of reefs around the little Andaman Island (sponsored by MoEF).
- Survey and Monitoring of Coral reefs of

Andaman and Nicobar Islands (sponsored by Dept. of Environment and Forests, A and N Islands).

- Lead Institution: Great Nicobar Biosphere Reserve (sponsored by MoEF).
- Studies on the Faunal diversity of Great Nicobar Biosphere Reserve (sponsored by MoEF).
- Faunal Diversity of Protected Area in Chhattisgarh (sponsored by CAMPA, Chhattisgarh).
- District-wise Faunal Diversity of Chhattisgarh (sponsored by CAMPA, Chhattisgarh).
- Rapid EIA on the alignment of road in Great Nicobar Island, Andaman and Nicobar islands
- Preparation of Management Plan (Year 2012-2021) for Lohabarrack Crocodile Sanctuary.
- Strengthening of Marine Aquarium and Regional centre at Digha, West Bengal (sponsored by World Bank).

#### Studies of DNA material for molecular studies

- Memorandum of Understanding (MOU) has been signed with Indian Institute of Sciences, Bangalore for molecular study of Fishing Cat.
- A MOU between ZSI/ANRC, Port Blair and ICAR CARI, Port Blair has been signed for the collaborative study on Marine Sponges-Bar coding.

#### Research Activities

#### Discoveries of New Taxa / Species

During the surveys 13929 examples of various groups of animals were collected. Altogether 19010 examples belonging to 793 species were identified by the scientists of ZSI Head Quarter and regional centres. In addition 29 species new to science have

been described during the year and 15 species were added to new the fauna of India.

### Species New to Science

Class: Amphibia

Order: Anura

Family: Rhacophoridae

- *Raorchestes agasthyaenis*
- *Raorchestes crustai*
- *Raorchestes johnceei*
- *Raorchestes kadalarensis*
- *Raorchestes theuerkaufi*
- *Raorchestes manohari*
- *Raorchestes ravii*
- *Raorchestes thodai*
- *Raorchestes uthamani*
- *Raorchestes bijui*

Family: Nyctibatrachidae

- *Nyctibatrachus jog*
- *Nyctibatrachus pocha*
- *Nyctibatrachus grundis*
- *Nyctibatrachus pillai*
- *Nyctibatrachus shirdi*
- *Nyctibatrachus gavi*
- *Nyctibatrachus vrijeuni*
- *Nyctibatrachus periyar*
- *Nyctibatrachus acanthoderis*
- *Nyctibatrachus danieli*
- *Nyctibatrachus devein*
- *Nyctibatrachus indranelli*

Order: Gymnophiona

Family: Ichthyophidae

- *Ichthyophis davidi*

Class: Insecta

Order: Hymenoptera

Family: Pteromalidae

- *Ischyroptyx biharensis*
- *Merismomorpha intermedia*
- *Merismomorpha tamilnadensis*
- *Psilocera intermedia*

- *Psilocera namdaphaensis*

Family: Scelionidae

- *Paridris spinosus*

### New addition to the fauna of India

- *Pseudobiceros apricus*
- *Aplysia parvula*
- *Oziotelphus wagrakarowensis*
- *Aegiris villosus*
- *Aeolidiella alba*
- *Chalidoneura fulvipunctata*
- *Dermatobranchus rodmani*
- *Glossodoris rufomarginalis*
- *Glossodoris tomsmithi*
- *Kaloplocamus acutus*
- *Noumea alboannulata*
- *Noumea angustolutea*
- *Thuridilla indopacifica*
- *Thuridilla albopustulosa*
- *Acropoma argentistigma*

### Taxonomic studies

The research work carried out on the fauna collected from different states, protected areas and important ecosystems are as follows;

### Fauna of India

The following volume was published during the year 'Fauna of India: Eulophinae: (Insecta: Hymenoptera)''.

### Fauna of States

The details of number of species identified from different surveys of different states are given in Table-3.

### Tiger / Biosphere Reserve

Sunderban, West Bengal - Four species of Grasshopper, fourteen species of Crustacea and 44 species of Fishes were determined.

Eastern Ghat, Tamil Nadu - Twenty species of Protozoa, twenty seven species of Cladocera, six species of insects, six species

**Table-3.** State wise status of species identified from different surveys

States/UT's	Protozoa	Rotifera	Nematoda	Mollusca	Annelida	Crustacea	Cladocera	Decapoda	Insecta	Odonata	
Andhra Pradesh			3								
Assam	7		2								
Bihar				10					43		
Haryana			18							5	
Himachal Pradesh									16		
Jharkhand					5				9	216	
Karnataka						5			28		
Kerala									5	13	
Madhya Pradesh									9		
Maharashtra				35		75			56	12	
Manipur									2		
Orissa						3		3			
Rajasthan		7	4	10						5	
Tamil Nadu	13	9			9		6		2	4	
Uttarakhand						8			63	30	
Uttar Pradesh				160							
West Bengal					3	3					
States/UT's	Orthoptera	Hemiptera	Homoptera	Coleoptera	Lepidoptera	Arachnida	Echinodermata	Fishes	Amphibia	Reptilia	Mammalia
Andhra Pradesh								28			
Assam								3			
Haryana					27			3	2		
Himachal Pradesh			18	6	26						
Madhya Pradesh		73		44		16		3			
Maharashtra					13			10		15	
Manipur				2				9			
Meghalaya		3						8	8		
Orissa								3			
Rajasthan	5	17		9	9						
Tamil Nadu	5						13	40			
Uttarakhand					41						
Uttar Pradesh		4									
West Bengal								95	7		4

of Lepidoptera, three species of Butterflies, twenty nine species of Rotifera, two species of Ostracoda, twenty five species of fishes and twenty six species of Reptiles were studied and determined.

Jhilmil Jheel, Uttakhand - Thirty two species Lepidoptera, 12 species of Insecta, nine species of Crustacea, 15 species of Nematoda, five species of Platyhelminthes and three species of Amphibians were determined.

Gulf of Mannar, Tamil Nadu - Three species of Nematodes, three species of earthworms and 15 species of sponges were determined.

### Wildlife sanctuary

- Phansad, Maharashtra - One species of Arachnida, three species of Insecta, 11 species of Lepidoptera, six species of Collembola, two species of Crustacea and two species of Fishes were determined.
- Veerangana Durgavati, Madhya Pradesh - Twenty two species of Lepidoptera and eight species of Mollusca were determined.
- Singhori, Madhya Pradesh - Six species of Protozoa, 42 species of Coleoptera, 10 species of Lepidoptera and 16 species of Arachnida were determined.
- Chail, Himachal Pradesh - Two species of insects and three species of fishes were determined.
- Parmadan, West Bengal - Nine species of Arachnida were studied and determined.
- Malabar, Kerala - Five species of Pteromalidae and five species of Mollusca were determined.
- Govind, Uttarkhand - Eight species of Brachiopoda were studied and determined.
- Radhangari, Maharashtra - Ten species of Crustacea were determined.

- Simbalbara, Himachal Pradesh - Thirty three species of Coleoptera were determined.
- Kalatop-Khajjar, Himachal Pradesh - Eight species of Insects were determined.
- Kalesar, Haryana - Eight species of Fishes were determined.
- Kanyakumari, Tamil Nadu - Three species of Insects, three species of Hemiptera and seven species of sponges were determined.
- Sitamata, Rajasthan - Four species of Odonata, nine species of Homoptera were determined.

### National Parks

- Namdapha, Arunachal Pradesh - Six species of Pteromalidae were determined
- Keibul-Lamjao, Manipur - Six species of Reptiles were determined.
- Chandoli, Maharashtra - Twelve species of Insects and two species Crustacea were determined.

### Fauna of Important Ecosystems

- **Desert** (Aravalli) - A total of eight species of Odonata and 16 species of Lepidoptera were studied and determined.

### Wetland / Fresh water / Riverine

- Beas River, Punjab - A total of eight species of Fishes were studied and determined
- Palair and Cumbum Lake, Andhra Pradesh - 11 species of Fishes, four species of Hemiptera, three species of Coleoptera, five species of Mollusca, and four species of Cladocera were determined.
- Damodar river, Jharkhand - seven species of Mollusca were studied and determined.
- Kabini river, Karnataka - Fifteen species of Fishes were determined.

- Lakes of Udaipur, Rajasthan - Three species of Telenchidae (Nematoda) were determined.
- Konkan region, Maharashtra - Seven species of Fishes were studied and determined.

### Forests

- **East Khasi Hills, Meghalaya** - Twelve species of Hemiptera, one species of Earthworm, twenty two species of Fishes and eighteen species of Amphibia were studied and determined.
- **Jamini, Maharashtra** - Ten species of insects were determined.
- **Kairoyan Hills, Tamil Nadu** - One species of Reduvidae (Hemiptera) and one species of Cercopidae (Hemiptera) were identified.

### Marine / Island / Coastal

- Pallikarani marsh, Tamil Nadu - Totally nine species of Amoebae and sixteen species of Fishes were determined.
- Andaman and Nicobar - Five hundred fifty species of Scleractinian corals, one hundred four species of Echinoderms, fifty nine species of Nudibranchs, one hundred four species of Gastropods, thirty three species of Crustacea, one hundred sixty seven species of butterflies, Forty eight species of Ophisthobranchs, seventy three species of Mollusca, five species of Odonata, three species of Gorgonids, thirty five species of Dragonflies, eight species of Sponges, five species of Polyclads, one hundred twenty four species of Fishes, two species of Reptiles, seventy seven species of Birds and five species of mammals were determined.



Fig-15. *Raorchestes manohari*

### Other studies

- **Pictorial Handbook on Fishes of NE:** List of 400 species updated and photography is under progress.
- **Pictorial Handbook on Dragonflies and Damselflies of Rajasthan:** Description of 15 species were completed and two photo plates were prepared.
- **Pictorial Handbook on Fishes and Amphibians of Himachal Pradesh:** Diagnostic characters of 15 species of Fishes and 17 species of Amphibians were completed.
- **Pictorial Handbook on Butterflies of Arunachal Pradesh:** The manuscript has been submitted for the publication.
- **Identification and Advisory services:** The ZSI continued its task of rendering Identification and Advisory services free of cost to research and teaching institutions in India and abroad, Central and state Government/Agencies, NGO's, Industries and also to individuals on zoological specimens and related matters.
- **Development of National Zoological collections:** The ZSI as a National repository of Zoological

collections, maintains identified species belonging to all animal groups in the country. The National Zoological collections were further enriched by the addition of 13929 examples of specimens (unnamed) and 19010 identified specimens pertaining to 793 species.

### Training and Extension

During the year four programmes were organized (i) Environmental Day was observed on 7<sup>th</sup> June, 2011(ii) International Biodiversity Day was celebrated on 24<sup>th</sup> May, 2011(iii) A National Seminar on Traditional Knowledge and Social Practices Promoting Biodiversity Conservation' was organized on 24<sup>th</sup> September, 2011 (iv) A National Seminar on natural and Anthropogenic Hazards of Environment-their Impact on Biodiversity and Conservation, and Biotechnological Approach for its remedies' is being jointly organized at Vidyasagar College, Kolkata.

### Publications

- **Fauna of India**  
Eulophinae (Insecta: Hymenoptera)
- **Records of Zoological Survey of India:** Vol.111. Part -1
- **Occasional Papers:** No. 325, 328, 329, 330, 331 and 332.
- **Handbook and Pictorial guides:** Hand book on plant and soil Nematodes of Rajasthan.

### Special Publications

- Animal Discoveries
- Critically Endangered Animals of India
- Prani Vigyan Ki Vargikaran Shabdawali
- **State fauna Series:** Fauna of Tamil Nadu (Part-2)
- **Wetland Ecosystem Series:** Series No. 14, Chorus of Bihar

### State-wise status

There are 28 States and seven Union territories in the country. Based on the survey and taxonomic work carried so far, ZSI has published faunal documents pertaining to the states (including Union Territories) of Andhra Pradesh (eight volume), Arunachal Pradesh (two volume), Bihar (including Jharkhand (one volume), Delhi (one volume), Goa (one volume) Gujarat (two volumes), Lakshadweep (one volume), Madhya Pradesh (including Chhattisgarh ( two volumes), Manipur ( three volumes), Meghalaya (ten volumes), Mizoram (two volumes), Nagaland (one volume), Orissa (four volumes published), Sikkim (five volumes), Tamil Nadu (one volume), Tripura (four volumes), Uttarakhand (three volumes) and West Bengal (twelve volumes). State wise numbers of species identified from different surveys are given in Table-3.

### Regulatory Acts/ Rules governing the programme and promulgation of new Acts, if any, along with the details

The Regulatory Acts/Rules governing the programme of The Zoological Survey of India

**Table-4.** Comparison of progress

Sl. No.	Physical targets	Achievement during the Financial year 2010-11		Achievements during the Financial year 2011-12 (Till November, 2011)	
		Targets	Achievements	Targets	Achievements
1.	Surveys conducted	131	127	124	71
2.	Publication	35	36	26	10
3.	Species identified	1500	1650	1500	793

**Table-5.** Budget allocation of the scheme during the year and Progress of Expenditure  
(Rs. in Thousand)

Plan				Non Plan			
BE	RE	Expenditure Upto	%	BE	RE	Expenditure Upto	%
2011-12	2011-12	29.02.2012		2011-12	2011-12	29.02.2012	
144900	179900	171152	95.13	143500	168500	160273	95.11

are (i) Indian Wildlife (Protection) Act, 1972 with the objective of effectively protecting the wild life of the country and to control poaching, smuggling and illegal trade in wildlife and its derivatives. The objectives of this Act is to provide protection to the listed endangered fauna and ecologically important protected areas in the country. In addition, ZSI providing (1) status survey of endangered species (2) identification and supporting protection of endangered Wildlife to WCCB, Customs and Forest Department (3) providing Faunal Diversity of Protected Areas and (ii) The Biological Diversity Act, 2002, which recognizes the sovereign rights of states to use their own Biological Resources. The Act aims at the conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process or

purposes. ZSI is supervising in providing information for People's Biodiversity Rights as well as safe guarding designated faunal repository of the country.

### Implementing organizations along with details of responsibilities

Zoological Survey of India, Kolkata along with its 16 regional centres at different parts of the country is implementing all activities. The main responsibilities of ZSI and its 16 regional centre are survey, collection, documentation (including the traditional knowledge associated with animals) and *ex situ* conservation of wild animal diversity of the country.

High priority areas include:

- Survey and Identification of fauna.
- Publication of National and State faunas.
- Taxonomic studies, revisionary/monographic studies on selected animal groups.
- Identification of Red list species and species rich areas needing conservation and focus on data deficient species to collect more information on populations.
- Development of National database of Indian animals including Museum specimens, live specimens, paintings, illustrations etc. and maintenance of already



Fig-16. Spotted tree frog, (*Rhacophorus bipunctatus*)

existing collections with modern facilities and as per international standards of collection management.

- Developing and maintaining Museums and using such facilities for conservation education for people especially students.
- *Ex situ* conservation of critically threatened taxa.
- Capacity building in taxonomy, nomenclature, specimen collection, preservation and maintenance through training programmes.
- Digitization of present collections, preparation of fine scale distribution maps based on primary occurrence data and making it available in a searchable format.

**List of autonomous, attached and regional offices with updates under the administrative control of the Division.**

There are sixteen regional centres of Zoological Survey of India located at different parts of the country as follows:

- Andaman and Nicobar Regional Centre, Port Blair
- Arunachal Pradesh Regional Centre, Itanagar
- Central Zone Regional Centre, Jabalpur
- Desert Regional Centre, Jodhpur
- North Eastern Regional Centre, Shillong
- Estuarine Biology Regional Centre, Gopalpur on Sea
- Freshwater Biology Regional Centre, Hyderabad
- Gangetic Plains Regional Centre, Patna
- High Altitude Regional Centre, Solan



Fig-17. Saza (Serow), State Animal of Mizoram

- Marine Aquarium and Research Centre, Digha
- Marine Biology Regional Centre, Chennai.
- Northern Regional Centre, Dehradun
- Southern Regional Centre, Chennai.
- Sunderbans Regional Centre, Canning
- Western Regional Centre, Pune
- Western Ghat Field Research Centre, Kozhikode

**Forest Resources and Survey  
Survey and Utilisation (SU) Division**

Survey & Utilization (SU) Division deals with the matters related to Forest Survey of India, Dehradun, Andaman & Nicobar Forest & Plantation Development Corporation Limited, Port Blair, all State Forest Development Corporations, Export & Import of wood and wood products, Forest Certification, Sustainable Forest Management, International Tropical Timber Organization, National Forestry Database Information System, Sustainable Forest Management (SFM) Cell among the other matters.

The Division executes plan scheme 'Strengthening of Forestry Division' with five



Fig-18. A view of dry deciduous forests in Ranthambhore

components under which the main works of the division related to above mandate are executed. These works component wise are described in detail along with the achievements during the year.

## Forest Survey of India (FSI)

### Introduction

Forest Survey of India (FSI), an organization under Ministry of Environment & Forests, Government of India is engaged in the assessment of the country's forest resources on a regular interval. Established on June 1, 1981, the Forest Survey of India succeeded the "Pre-investment Survey of Forest Resources" (PISFR), a project initiated in 1965 by Government of India with the sponsorship of Food and Agriculture Organization (FAO) and United Nations Development Programme (UNDP) to ascertain the availability of raw material for establishment of wood based industries in selected areas of the country. Pre-Investment Survey of Forest Resources (PISFR) was reorganized into FSI in June 1981. The mandate of FSI was refined in 1986 in order to make it more relevant to the rapidly changing needs and aspirations of the country.

The Forest Survey of India is headquartered at Dehradun and has four zonal offices located at Shimla, Kolkata, Nagpur and Bangalore. The organization is

headed by a Director General who is assisted by two Joint Directors at headquarter who are looking after the National Forest Data Management Centre (NFDMC) and the Training & Forest Inventory (TFI) wings and supported by Deputy Directors, Assistant Directors and other technical staff. Each zonal office is headed by a Regional Director supported by Deputy Director and other technical staff. The Headquarter as well as the Zonal

offices work in close coordination to carry out the various activities of FSI.

### Some main activities of Forest Survey of India

- **Forests & Tree Cover Assessment:** Forest Survey of India (FSI) assesses forest cover of the country by interpretation of satellite data on a two-year cycle and presents the information in the form of 'India State of Forest Report'. With the release of the 'India State of Forest Report 2009' so far 11 cycles of forest cover assessment have been completed since 1987. Work for the 12th cycle is completed and final report of India State of Forest Report (ISFR) 2011 is ready for release. With the advancement of technologies of image processing and data quality of remote-sensing, the methodology of forest cover assessment has improved to provide more accurate data products for better operational management and planning. In addition to forest cover, assessment of tree cover of the country is also being carried out using the Trees Outside Forests (TOF) inventory data. The scale of interpretation has improved from 1:1 million (SFR 1987) to 1:50,000 bringing down the minimum mappable area to one hectare from 400 hectare. The spatial resolution of the sensor has come

down from the course resolution of 80 m x 80 m to a fine resolution of 23.5 m x 23.5 m.

**Atlas: Forest Types of India:** The FSI is also preparing for the first time a Atlas of forest types of India. This is based on the Champion & Seth Classification (1968), which is the standardized forest type classification system followed in India. The classification depicts India's rich forest diversity into 16 forest types groups and 200 types including subtypes and variations. The exercise has been undertaken under the National Natural Resource Management System Sub-Committee on Bio-Resources (NNRMS SC-B).

- **Forests & TOF inventory preparation:** Inventory of forests and Trees Outside Forests (TOF) is one of the major activities of FSI. Forest growing stock (wood volume) has traditionally been a key indicator of forest wealth and its estimation has formed a major activity of forest resource assessment/inventory. In India, systematic forest inventory began in 1864 when the preparation of working plan started and has remained central to the forest management at divisional/district level. A new National Forest Inventory (NFI) has been designed and adopted by FSI since 2002. The country has been divided into 14 physiographic zones & 60 districts randomly selected from these zones on probability proportional to size are inventoried in two years. The first such estimate was published in 'SFR 2003'. In addition to inventory of forests, Trees Outside Forests (TOF) resources are also inventoried concurrently to provide a national estimate of growing stock of TOF on a two year cycle. About 10,000 sample plots are laid out in TOF areas. In the recent past TOF resources have gained importance because of

their increasing role in social cause due to advent of FRA, Tribal Acts etc. A total target of 30 districts have been fixed for inventory of forest and TOF to be completed during the year 2011-2012.

- **Training:** Forest Survey of India (FSI) has been imparting training since 1981 on the modern techniques applied in forest inventory and surveys. During the current financial year, 100 forest personnel from the various State Forest Departments have been trained in the training courses run by the FSI till 31st December, 2011 on the following themes, to integrate modern technology and field applications:-
  - Application of Remote Sensing and GIS in Effective Forest Planning and Management.
  - Remote Sensing and its Application in Natural Resource Management.
  - Application of GPS in Forest Surveys and Demarcation.
  - Forest Inventory and TOF Inventory Techniques.

Since its inception, more than 4,000 Forestry Personnel from State Forest Departments have been trained at FSI. Recently in a capacity building effort, one week training on **Change detection and Vegetation Mapping** was organized at USDA Forest Service Remote Sensing Application Centre, (RSAC) at Salt Lake City, Utah from December 12<sup>th</sup> to 16<sup>th</sup> December 2011 for five officers from Forest Survey of India, one each from Indian Council of Forestry Research & Education and Ministry of Environment and Forests. The training was a good exposure to the latest technologies and their applications for natural resource monitoring and management. It has also provided a perspective on what could be the future collaborative areas for carrying out capacity building.



Fig-19. Sâw leng rama chul thlâm, a Typical jhum hut at Sâw leng Village in Mizoram

## Major Achievements

### Indo US Forest and Carbon Workshop

Forest Survey of India (FSI) has conducted a three day workshop on Indo-US Forest Inventory and Monitoring of Carbon Tools and Technologies during 7<sup>th</sup> - 9<sup>th</sup> June, 2011 at FSI Dehradun. During the workshop FSI and United States Forest Services (USFS) experts exchanged the methodologies and technologies being used for estimation and monitoring of forest and carbon.

### Monitoring of Land Use and Land Cover using Remote Sensing and GIS techniques in the Bellary, Chitradurga and Tumkur Districts of Karnataka

Land Use and Land Cover change assessment based on the analysis of multi-temporal satellite data has been carried out as part of Macro level Environmental Impact Assessment (EIA) study carried out for Bellary,

Chitradurga and Tumkur districts on the directions of the Hon'ble Supreme Court of India. The area affected due to mining activities has been assessed between the two periods i.e. 2000-2006 and 2006-2011 so as to identify the extent of mining and subsequently the area mined outside the leased area on qualitative basis. Overall, the present macro EIA study highlights the extent of mining and consequently the change in Land use and Land Cover during the period 2000-2011.

### Forest Fire Monitoring

Forest fire monitoring has been carried out in FSI since November 2005. As part of the process, the forest fire data generated by MODIS satellite system is overlaid on the forest cover map prepared by interpretation of satellite images. The latitude and longitude of the forest fire points are listed and uploaded on the FSI website ([www.fsi.nic.in](http://www.fsi.nic.in)). Since

March 2010, an SMS/e-mail alert service was launched under which any internet user registered on the FSI website via mobile number/email address, gets an SMS/email alert every day summarizing the forest fire points detected in his area of interest in the last 24 hrs. The service has been applauded well and preliminary feedback suggests over 95% accuracy level. Efforts are being made to reduce the reaction time of forest fire reporting from 24 hrs to six hrs. This shall be achieved by collaborating with NRSC for transfer of direct readout of the satellite data which will be sent through FTP to FSI. In addition it is envisaged that Nodal officers shall be created at the State Forest Departments level to disseminate the information received from FSI to the fire affected forest areas.

### Green India Mission

A meeting of officers of State Forest Departments was held as part of the expert

consultation for identification of landscapes and operating units under Green India Mission at Forest Survey of India, Dehradun on 4<sup>th</sup> November, 2011. The main objective of this conference was identification of operational areas ranging from 5,000 hectares - 10,000 hectares. For the purpose of the study of area at compartment level, South Seoni Division of Madhya Pradesh was selected.

### Aravalli Hills-Mining and Mapping Project

The task of the mapping of mining areas of the Aravalli hills and mining leases therein for 15 districts of Rajasthan is being carried out by FSI pursuant to the Hon'ble Supreme Court Order dated 19.2.2010 in IA No. 828 in W.P. (Civil) no. 202/1995.

As part of the same, delineation of 'Aravalli Hills' in the State of Rajasthan and creation of a mosaic and spatial database of high resolution satellite imageries of the Aravalli Hills (LISS IV, CARTOSAT II, Quickbird



Fig-20. Task of the mapping of mining areas of the Aravali hills

etc.) of the latest period have been completed. The generation of the forest cover map (FCM) of the Aravalli Hills based on LISS IV satellite data is presently being carried out.

### **Forest Cover Mapping of Punjab State using LISS IV satellite Data**

Forest Cover Mapping of Punjab State was carried out by FSI in 2008 as part of a project. This project entailed forest cover mapping of 17 districts of Punjab using IRS-P6 LISS IV (Spatial Resolution 5.8 m) and total 172 LISS IV scenes covering the whole of Punjab. Forest Cover assessed in all districts of Punjab has been mapped at the scale of 1:25000 with minimum mappable area of 0.125 hectare in different canopy density classes. Forest nurseries, road side plantation, rail side plantation, canal side plantation, new plantation areas (Government/Private) and plantation in agricultural land have been mapped under TOF category. Interpretation was followed by extensive ground verification in July, 2011 and November, 2011 respectively and the necessary corrections were incorporated subsequently. District wise Forest cover map of Punjab has been prepared.

### **National Spatial Data Infrastructure (NSDI)**

National Spatial Data Infrastructure (NSDI) for India is an initiative undertaken by Department of Science and Technology, Government of India. NSDI aimed at encouraging collection, aggregation and distribution of spatial data on different themes on a common defined set of standards and formats by different mapping agencies in India. FSI is the nodal agency for forestry sector for the DST endeavour aimed at creating a portal from which users may directly access and buy all kinds of spatial data generated by Indian mapping agencies.

### **Network of Regional Offices**

Six Regional Offices have been set up at Bangalore, Bhopal, Bhubaneswar, Lucknow,

Shillong and Chandigarh, with the Headquarter unit at New Delhi in the Ministry:-

### **Main functions (Objectives) of the Regional offices are:-**

- To monitor and evaluate all ongoing forestry development projects and scheme with specific emphasis on conservation of forests;
- To assist the State/UT Governments in preparation of the proposals involving diversion of forests land for non-forestry purposes under the provisions of Forest(Conservation) Act, 1980;
- To undertake physical inspection of site in cases of diversion of forestland involving an area of more than 40 ha.
- To monitor the implementation of conditions and safeguards stipulated by Central Government in the proposal approved under Forest (Conservation) Act, 1980.
- To assist the State/UTs in the preparation of management plans for working of forest under their control within the framework of guidelines issued by Central Government from time to time;
- To assist the State/UTs in streamlining collection, collation, storage and retrieval of data / covering all forestry activities and to transmit such data to the Central Government/ Central Data Processing Unit.
- To dispose of proposal for diversion of forestland up five ha. & to examine / process the proposal above five ha. to 40 ha.; except regularization of encroachment and mining.
- To render assistance in preparation of the National Forestry Action Plan.
- To assist Paryavaran Vahinies in the capacity of observers as well as technical advisors;
- To monitor implementation of conditions and safeguards laid down by the Ministry

for Environmental clearance under EPA 1986.

The Headquarter Unit at New Delhi in the Ministry is responsible for administration, supervision and co-ordination of all the activities relating to the functions assigned to the Regional Offices as enumerated above under the overall control of the Ministry of Environment & Forests.

### Forest Certification of Timber and Non-Timber Forest Products

Forest Certification has emerged as a voluntary market-driven mechanism in support of Sustainable Forest Management (SFM). Certification initiatives rely on consumers exercising purchasing choice in favour of products labelled as originating from forests certified to have been sustainably managed. Certification and Eco-labelling are the new mantras to enhance the product positioning for a premium price on one hand and ensuring better forest management practices on the other hand.

The report by National Forest Certification Committee was submitted in September, 2010 and was circulated to all the State Forest Departments to furnish their comments on the same. The Ministry has also constituted a **Core Committee** under the chairmanship of Director General of Forests & Special Secretary in the Ministry to undertake one-on-one consultation with stakeholders and firm up the concept of the envisaged Indian Forest Certification Council.

After one to one consultation with different stakeholders, a meeting was also held in the Ministry on 13<sup>th</sup> and 14<sup>th</sup> June, 2011, where all the stakeholders unanimously accepted the proposed framework of Indian Forest Certification Council and it was suggested that the Ministry should facilitate to prepare a draft concept note of Indian Forest Certification Council as per the recommendations received from various stakeholders.

The Ministry is in the process of preparing draft report of Indian Forest Certification Committee related to Standard setting, accreditation body set up, set up of administrative and technical committee, structure of council, composition, ToRs of the council, its objective activities and source of funding.

### Development of National Forestry Database Management System (NFDMS)

The main objectives of the scheme are:

- To prepare a blue print towards the development of National Forestry Database Management System to monitor the programmes. Forest Survey of India is its nodal agency.
- To develop Forest Statistics Database and to ensure advocate networking with the State / UTs Forest Department. The database system will collect, compile and disseminate information on the production and consumption pattern of forestry products including Timber, Non Wood Forest Products, Forest Trade and data related to Export, Import of Forestry Products. Scheme aims for development of National Forest Management System integrated with information systems of the States to ensure effective monitoring with a universal access of all stakeholders. It is taken care of by Statistical Cell under SU Division. Upgradation and compilation of forestry data being a continuous process, the cell would continue to work during 12<sup>th</sup> Five Year Plan.

Forest Survey of India has submitted an EFC Memo on Strengthening of Forestry Database and Monitoring of all the Central Sponsored Scheme during the current year 2010-11. It was also decided that the above objectives of 'National Forestry Database Management System' will be also be a part of schemes of FSI.

The Ministry in the current year has also reviewed the progress of the project 'Survey of Status, Current Utilization and Potential for Sustainable Utilization of Biodiversity Resources in Andaman & Nicobar Islands' sanctioned to Andaman & Nicobar Islands Forest & Plantation Development Corporation Ltd. (ANIFPDCL), Port Blair.

### **National Coordinated Programme for Assessment of Non-Timber Forest Products Resources**

The scheme was introduced during 11<sup>th</sup> Five Year Plan for assessment of Non Timber Forest Product Resource focuses on assessment, monitoring and evaluation studies in the broad areas of forestry trade, production and disposal of NTFPs in the country.

Planning Commission has recently suggested that the Ministry of Tribal Affairs, Govt. of India, shall be the nodal and administrative Ministry for operationalizing the Minimum Support Price for Minor Forest Produces (MFPs). Planning Commission has also given the responsibility to the Ministry of Environment & Forests for compiling National Level information regarding data related to MFPs such as:-

- Quick assessment of condition of 12-14 important MFPs
- Making available planting material
- Training on sustainable productivity
- Management plans and working plans of MFPs to be drawn up in a transparent manner in consultation with Gram Sabhas

The Ministry of Environment & Forests is consulting various States for their suggestions for quick assessment of conditions of 12-14 important MFPs, making available planting material, training of sustainable productivity and other issues. In this regard, few meetings at the national level were also conducted during this year with the Nodal Officer from the States dealing with NTFP Management. Even an advisory was circulated to some

major producing NTFP States regarding Minimum Support Price of Minor Forest Produce.

During the current year, the Ministry has released an amount of Rs. 15.89 lakhs to FRI, Dehradun for the ongoing research project on estimation of Biomass, Role of Wood Carving, Bamboo etc. During the current year, the Ministry has reviewed project on 'Ensuring Fair Returns to Primary Collectors of Non timber Forest Products' which is executed by FRI, Dehradun. During the year 2010-11, the Ministry has also sanctioned a project to Indian Council of Forestry Research & Education (ICFRE), Dehradun for preparation of Forestry Sector Report, 2010.

### **Other Works of the Division under mandate that may be mentioned are:**

- **Export & Import of forestry products and Tariff structure forestry items**

The Division deals with the formulation of guidelines and directions for domestic and international trade in forest produce and the necessary regulation of export and import of forest produce as per the Foreign Trade Policy as well as the applied Tariff rates.

- **International Tropical Timber Organization (ITTO) - India's Contribution**

The International Tropical Timber Organisation (ITTO) was established during 1983 and is governed by the International Tropical Timber Agreement (ITTA). The ITTO is a commodity organisation bringing together the producer and consumer member countries to discuss and exchange information and develop policies of all aspects of the World Tropical Timber Economy. The Headquarter of ITTO is at Yokohama, Japan. There are 60 member countries, out of which 33 are Producer member countries and 27 Consumer member countries. India belongs to the group of the producing member countries. The

ITTO's membership represents 90% of world trade in tropical timber and 80% of the world's tropical forests.

The International Tropical Timber Agreement (ITTA), 1994 has been replaced by a successor agreement, i.e. the ITTA 2006. India as a signatory to ITTA 1994 has ratified and deposited the instrument of ratification with the UN Secretary General in New York on 25<sup>th</sup> July, 2008.

The governing body of the ITTO is the International Tropical Timber Council (ITTC), which is composed of all the organization members. The Council is supported by four Committees namely:-

- Committee on Economic Information and Market Intelligence
- Committee on Reforestation and Forest Management
- Committee on Forest Industry
- Committee on Finance and Administration

Sh. A.M. Singh, IFS is a member of Expert Panel of ITTO from India and he has attended 42<sup>nd</sup> & 43<sup>rd</sup> expert panel meetings of ITTO in Yokohama, Japan during August, 2011 & February, 2012 respectively. The 47<sup>th</sup> session of the International Tropical Timber Council (ITTC), the governing body of ITTO was held at Guatemala during 14<sup>th</sup> - 19<sup>th</sup> November, 2011 and was attended by Deputy Inspector General of Forests, Survey & Utilisation Division as Indian delegate.

– **UK - India Forest Landscape Restoration Project**

During the year, the Ministry has approved the Phase I of UK - India Forest Landscape Restoration Project which is executed by Indian Council of Forestry Research & Education, Dehradun. The ICFRE, Dehradun has received Rs. 1.35 crores from DFID for the above project. During the 1<sup>st</sup> phase of the project, the UK Forestry Commission and their Forest Research Agency

(FRA) alongwith Indian counterpart agencies i.e. ICFRE, FRI, TERI, State Forest Department of Uttarakhand, Madhya Pradesh and Orissa States; Forest Survey of India; and Indian Institute of Forest Management undertook a review of the status of FLR in Madhya Pradesh, Orissa and Uttarakhand as pilot States for study, apart from the desk review of FLR initiatives at country level.

– **Sustainable Forest Management (SFM) Cell**

Sustainable Management of Forests is not a new concept in India. India remains committed to the goals of Sustainable Forest Management is a signatory to the "Objective 2000" of the ITTO.

The Ministry has sanctioned the three projects on Criteria & Indicators for Sustainable Forest Management to Indian Institute of Forest Management (IIFM), Bhopal. During the current year, IIFM has submitted its report on above three projects to the Ministry and the same will be reviewed in the Ministry with the representative of State Forest Departments and Senior Officers of the Ministry. The FRI, Dehradun had been entrusted with responsibility to execute a project for revising Working Plan Code by incorporating final C&I for SFM and annexing microplan processes for JFM areas and Eco-development areas.

– **Andaman & Nicobar Islands Forest and Plantation Development Corporation Ltd.**

Andaman & Nicobar Islands Forest and Plantation Development Corporation Limited (ANIFPDCL) is a Government of India Public Sector Undertaking, created in 1977 with the broad objectives of development and managing forestry plantations on the Islands. The Corporation has three main activities namely (i) Forestry Project, (ii) Red Oil Palm (ROP) and (iii) Katchal Rubber Project (KRP) in operation. Though once a 'Mini Ratna', it has now turned into a loss making undertaking

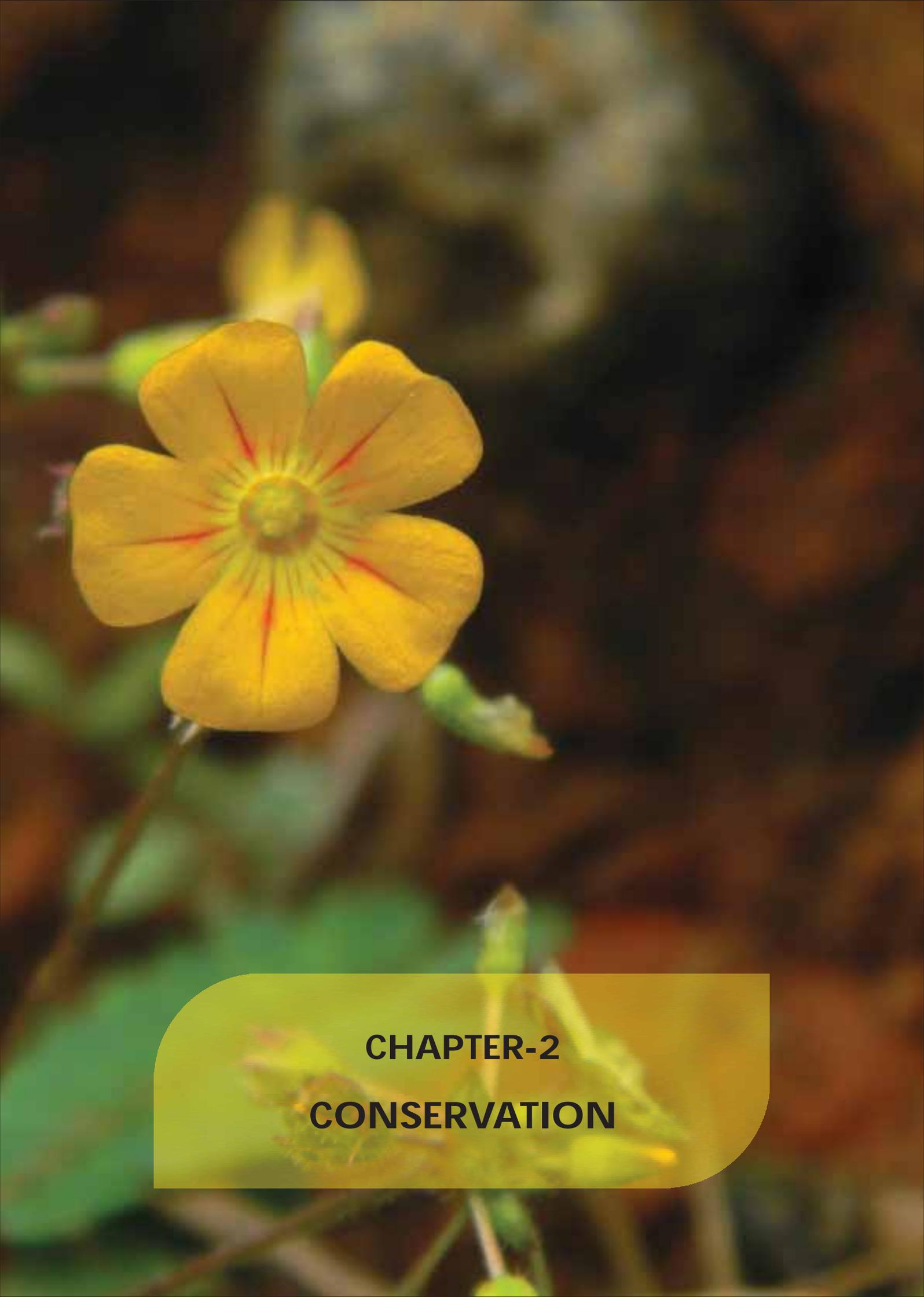
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mainly due to the fact that its main activity i.e. logging, has been curtailed by the Hon'ble Supreme Court's Order banning the felling of trees. Presently, the obligatory expenses of the Corporation like the payment of salaries, wages etc. are possible due to the sanction of interest bearing loans every year from the Govt. of India. During the year 2011-12, an amount of Rs.11.00 crores have been sanctioned and released to ANIFPDCL as an interest bearing loan for its statutory requirements.

In view of the above circumstances, a decision was taken for phased closure of

ANIFPDCL in a period of five years from 2011-2016, keeping in view that the majority of 1485 staff would be due for natural attrition during the five years period. Accordingly, a draft Cabinet Note was prepared for phased closure of ANIFPDCL alongwith pay / wage revision for processing.

In the meanwhile, Andaman & Nicobar Administration has proposed to take over the ANIFPDCL and revive it by diversifying its activities by venturing into eco-tourism provided its present liabilities are settled. The SU Division is in the process of preparing draft Cabinet Note & CNE for the same.



**CHAPTER-2**  
**CONSERVATION**

## Environmental Conservation

### Conservation and Management of Mangroves & Coral Reefs

#### Introduction

The Ministry of Environment & Forests is at the forefront in regard to the Conservation and Management of Mangroves & Coral Reefs. It accords high priority to the conservation and management of mangroves and coral reefs in the country.

#### The National Environment Policy and the Scheme

The National Policy, 2006 recognizes that Mangroves and Coral Reefs are an important coastal environmental resource. They provide habitats for marine species; protection from extreme weather events; and a resource base for sustainable tourism. The National Environment Policy underlines the need to mainstream the sustainable management of mangroves into the forestry sector regulatory regime and adopt a comprehensive approach to Integrated Coastal Zone Management.

#### Mangroves

Mangroves are plants that survive high salinity, tidal regimes, strong wind velocity, high temperature and muddy anaerobic soil - a combination of conditions hostile for other plants. The mangrove ecosystems constitute a symbiotic link or bridge between terrestrial and marine ecosystems. They are found in the inter-tidal zones of sheltered shores, estuaries, creeks, backwaters, lagoons, marshes and mud-flats. Mangrove vegetation has been reported in all the coastal States/UTs. India is home to some of the best mangroves in the world. West Bengal has the maximum of mangrove cover in the country followed by Gujarat and Andaman & Nicobar Islands. However, not all coastal areas are suitable for mangrove plantation as mangrove requires an appropriate mix of saline and

freshwater, and soft substrate like mudflats to be able to grow and perpetuate. The Government has identified 38 mangrove areas on a country wide basis for intensive conservation and management. (Table-6)

The Government seeks to sustain mangroves in the country by both regulatory and promotional measures. The Coastal Regulation Zone Notification, 2011, recognizes the mangrove areas as ecologically sensitive and categorizes them as CRZ-I(i), which implies that these areas are accorded protection of the highest order. Under the promotional measures, as said before, the Government has identified 38 mangrove areas on a country wide basis for intensive conservation and management. During the last financial year (2010-11), a sum of Rs.7.10 crores were released to various Coastal States/UTs under the Centrally Sponsored Scheme for 'Conservation and Management of Mangroves'.

#### State/UT wise Mangrove Cover

Mangrove ecosystems are rich in biodiversity and harbor a number of floral and faunal species (both terrestrial and aquatic) many of which, e.g. the tiger, gangetic dolphin, estuarine crocodile etc. are critically endangered. They also act as nurseries for fin fish, shell fish, crustaceans and mollusks. Mangrove forests are regarded as the most productive ecosystems in the world on account of the large quantities of organic and inorganic nutrients released in the coastal waters by these ecosystems.

The mangroves besides providing a number of ecological services also play a major role in protecting coastal areas from erosion, tidal storms and surges (tsunamis). They help in land accretion by trapping the fine debris particles. They are also an important source of honey, tannins, wax, besides fish. Presently, these are one of the most threatened ecosystems on account of both anthropogenic factors (reclamation of

Table-6. Mangroves Sites in India

State/Union Territories	Mangrove areas
West Bengal	1. Sunderbans
Orissa	2. Bhaitarkanika 3. Mahanadi 4. Subernarekha 5. Devi-Kauda 6. Dhamra 7. Mangrove Genetic Resources Centre 8. Chilka
Andhra Pradesh	9. Coringa 10. East Godavari 11. Krishna
Tamil Nadu	12. Pichavaram 13. Muthupet 14. Ramnad 15. Pulicat 16. Kazhuveli
Andaman & Nicobar	17. North Andamans 18. Nicobar
Kerala	19. Vembanad 20. Kannur (Northern Kerala)
Karnataka	21. Coondapur 22. Dakshin Kannada/Honnavar 23. Karwar 24. Manglore Forest Division
Goa	25. Goa
Maharashtra	26. Achra-Ratnagiri 27. Devgarh-Vijay Durg 28. Veldur 29. Kundalika-Revdanda 30. Mumbra-Diva 31. Vikroli 32. Shreevardhan 33. Vaitarna 34. Vasai-Manori 35. Malvan
Gujarat	36. Gulf of Kutchh 37. Gulf of Khambhat 38. Dumas-Ubhrat

land, discharge of waste etc) and natural factors like global warming.

Sundarbans in West Bengal accounts for almost half of the total area under mangroves in India. The Forest Survey of India has been

assessing the mangrove cover using remote sensing since 1987.

In the first assessment, the estimated extent of the mangrove cover was 4,046 km<sup>2</sup> which was carried out at 1:1 million scale.



Fig-21. Mangroves, home to a variety of species, need conservation

Subsequently, from 1989 to 1999 the mangrove covers were assessed regularly on a two-year cycle at 1:250,000 scale. Assessment from 2001 onwards has been carried out at 1:50,000 scale. State/UT-wise mangrove cover as assessed by FSI in different assessments is given in the Table-7.

The current assessment shows that the mangrove cover in the country is 4,662.56 km<sup>2</sup>, which is 0.14 percent of the country's total geographical area. The very dense mangrove comprises 1403 km<sup>2</sup> (30.10% of the mangrove cover), moderately dense mangrove is 1658.12 km<sup>2</sup> (35.57% of the mangrove cover) while open mangroves cover an area of 1600.44 km<sup>2</sup> (34.33% of the mangrove cover). Compared with 2009 assessment, there has been a net increase of 23.34 km<sup>2</sup> in the mangrove cover of the country. This can be attributed to increased plantations particularly in Gujarat State and regeneration of natural mangrove areas.

In case of Mangroves, the objectives of the Scheme are to help the coastal State Governments/Union Territories in rehabilitation of degraded Mangrove Areas and enhance Mangrove cover by replantation in the open mud flats etc. Financial Assistance is given to coastal State Governments/Union Territories for implementation of Management Action Plan on Mangroves under the Scheme. 100% assistance is given on grant basis to Coastal States/UTs for activities like Survey and Demarcation, Afforestation, Restoration, Alternative/Supplementary Livelihoods, Protection Measures and Education & Awareness.

The mangrove plantation with an average, annual target of 3,000 hectares is undertaken on a country wide basis. The areas supported are among the 38 areas as already identified by MoEF for intensive conservation. During 2010-11, financial assistance to the tune of Rs. 7.10 crores had

Table-7. State/UT-wise status of mangrove cover

(Area in km<sup>2</sup>)

S. No.	State/UT	Assessment Year												
		1987	1989	1991	1993	1995	1997	1999	2001	2003	2005	2009	2011	Change w.r.t. 2009
1	Andhra Pradesh	495	405	399	378	383	383	397	333	329	354	353	352	-1
2	Goa	0	3	3	3	3	5	5	5	16	16	17	22	5
3	Gujarat	427	412	397	419	689	901	1031	911	916	991	1,046	1058	12
4	Karnataka	0	0	0	0	2	3	3	2	3	3	3	3	0
5	Kerala	0	0	0	0	0	0	0	0	8	5	5	6	1
6	Maharashtra	140	114	113	155	155	124	108	118	158	186	186	186	0
7	Orissa	199	192	195	195	195	211	215	219	203	217	221	222	1
8	Tamil Nadu	23	47	47	21	21	21	21	23	35	36	39	39	0
9	West Bengal	2,076	2,109	2,119	2,119	2,119	2,123	2,125	2,081	2,120	2,136	2,152	2155	3
10	A&N Islands	686	973	971	966	966	966	966	789	658	635	615	617	2
11	Daman & Diu	0	0	0	0	0	0	0	0	1	1	1	1.56	0.56
12	Puducherry	0	0	0	0	0	0	0	1	1	1	1	1	0
	<b>Total</b>	<b>4,046</b>	<b>4,255</b>	<b>4,244</b>	<b>4,256</b>	<b>4,533</b>	<b>4,737</b>	<b>4,871</b>	<b>4,482</b>	<b>4,448</b>	<b>4,581</b>	<b>4,639</b>	<b>4662.56</b>	<b>23.56</b>

been distributed among West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa and Gujarat for Conservation & Management of Mangroves.

#### Mangroves for Future (MFF) - India's Initiative:

- The project entitled "Mangroves for Future (MFF): a strategy for promoting investment in Coastal Ecosystem Conservation" is being coordinated by the International Union for Conservation of Nature (IUCN) covering, initially, eight countries (including India) in South Asia, South East Asia and Western Indian Ocean. The project involves collaboration between multiple partners, including government agencies, NGOs, Research Institutes, UN agencies and other multilateral bodies. To oversee and guide the entire India country programme under IUCN-MFF (India) Programme as well as review, monitor and evaluate its implementation, a National Coordination Body (NCB) has been constituted by the Ministry.
- In 2011, the NCB (India) met twice to provide guidance and advice on the various ongoing initiatives of the MFF (India) programme. The 6th NCB meeting held on the 10th of August 2011 also approved eight new small grant projects in India, five of these have been contracted in 2011 and the remaining will be rolled out in the first quarter of 2012. (Table-8)
- The Regional Steering Committee (RSC)-8 was held in Male, Maldives during 24<sup>th</sup> - 26<sup>th</sup> October 2011. India was represented in this meeting by Dr. J. R. Bhatt, Member Secretary NCB (India) and Dr. N. M. Ishwar, MFF (India) National Coordinator. As suggested by India, the RSC approved the regional colloquium on sharing good practices on Mangrove Restoration and Rehabilitation to be held in India during August 2012. In addition to this regional event, the RSC also supported India's submission on three national level training events that are being proposed in 2012. These include:
  - Scuba diving for researchers and key frontline forestry staff
  - Taxonomy and long-term monitoring of lesser known marine taxa

**Table-8.** Status of new small grant projects in India

	Partner	Project	Duration (in months)	MFF grant value (INR)	Current status
1	Action for the Protection of Wild Animals (APOWA)	Community stewardship in conservation, restoration and sustainable management of mangroves in Orissa	12	814,340	Commissioned
2	Suganthi Devadason Marine Research Institute (SDMRI)	Seagrass resource survey and assessment in Gulf of Mannar and Palk Bay, Southeastern India	15	855,700	Commissioned
3	Wetlands International - South Asia	Stakeholder led management planning for Vembanad Kol backwaters, Kerala	12	880,000	Commissioned
4	Wildlife Trust of India (WTI)	An assessment of the past and present distribution of the Whale Shark ( <i>Rhincodon typus</i> ) across the Indian Peninsula	13	834,900	Commissioned
5	World Wildlife Fund (WWF)	Commercially important gastropod shell resources and trade in India: Distribution, Status & Conservation Strategies	18	794,200	Commissioned
6	Development Alternatives (DA)	Mangrove conservation and management: enhancing livelihood opportunities for mangrove dependent communities in Bhitarkanika reserve forest	10	875,000	To be initiated during 2012
7	Bombay Natural History Society (BNHS)	Ecological assessment and education for conservation of mangrove community in Ratnagiri district, Maharashtra	18	868,500	To be initiated during 2012
8	Coastal Gujarat Power Limited (CGPL, Tata Company)	Community based restoration, plantation and conservation of mangroves in village Kantiyajal, Bharuch, Gujarat	15	880,000	To be initiated during 2012
<b>Total Grant Amount (INR)</b>				<b>6,802,640</b>	

- Coastal zone management for enhancement of alternative livelihood support for coastal communities
- The RSC also recognized and endorsed the efforts made by NCB (India) and NCB (Sri Lanka) to develop a regional project in the Gulf of Mannar region. The RSC requested that a detailed proposal on this be prepared jointly and submitted for its initiation.
- MFF (India) has also published several knowledge products on India's coastal and marine diversity. These include;
  - Children's book on Mangroves titled, 'Soldiers of our Coast'. (2010.IUCN India Office. ISBN 978-2-8317-1264-2)
  - A Scientific publication on Mangroves titled 'Towards Conservation and Management of Mangrove Ecosystems in India'. (2010.IUCN India Office. ISBN 978-2-8317-1264-2)

- A Scientific publication on Coral reefs titled 'Coral reefs in India - Status, Threats and Conservation Measures' (in press).
- In addition to the above knowledge products, the MFF (India) also initiated the production of an educational movie 'Guardians of the Coast', in partnership with Mr. Mike Pandey (Riverbank Studios). The movie showcases the fascinating web of life that surrounds these tidal forests, including the regulatory and provisioning services they provide and the livelihoods of local communities that depend on them. The movie presents the unique collaborative efforts of governments, regional and local institutions, NGOs, local communities and international agencies in saving these vulnerable ecosystems and restoring them to their former glory. The movie now serves as an important knowledge product and awareness generating tool at a regional level for MFF. This movie was formally launched during RSC-8.
- A large grant project entitled 'Alternative Livelihood Options for Vulnerable mangrove Resource Users in the Sunderbans Biosphere Reserve, West Bengal' was signed on 16th November, 2011 by Ms. Aban Marker Kabraji, Regional Director, IUCN Asia and Mr. Suresh K. Das, Principal Secretary, Forest Department, Government of West Bengal. It will be implemented over two years and IUCN will pay to the Sunderbans Biosphere Reserve a maximum of USD 299,600.

### Coral reefs

The four major coral reefs areas identified for intensive conservation and management are: i) Gulf of Mannar, ii) Gulf of Kachchh, iii) Lakshadweep and iv) Andaman and Nicobar Islands. The emphasis is on preventive aspects through monitoring and

surveillance as the restoration work is both costly and time consuming. The Ministry provides financial assistance to the State Forest Departments of all the four identified coral reefs areas in the country for activities like monitoring, surveillance, education & awareness. Besides, the Ministry also supports R&D activities with emphasis on targeted research on coral biodiversity, its management including various aspects of pollution in these areas.

The Indian reef area is estimated to be 2,375 km<sup>2</sup> for encouraging targeted research on both hard and soft corals in the country; the Ministry has established a National Coral Reef Research Centre at Port Blair.

### Monitoring mechanism

Two tier system at National and State level are in operation for effective coordination to implement the Scheme on Mangroves and Coral Reefs:

#### A. National level

- The National Committee on Mangroves and Coral Reefs monitors the implementation of the approved Management Action Plans of the Coastal States & UTs.
- To supplement base line information on priority areas of research, projects are sanctioned to Universities and research institutes. A meeting of the Expert Group-B on 'Conservation & Sustainable Utilization of Natural Resources: Mangroves & Coral Reefs' was held on 23<sup>rd</sup> -24<sup>th</sup> March 2011. The Group considered 48 projects and recommended ten research projects in the area of mangroves and coral reefs, which are being sanctioned by the Ministry.

#### B. State Level

- State level Steering Committee have been constituted under the Chairmanship of Chief secretaries/Additional Chief

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secretaries/Principal Secretaries of Department concerned having members from subject matter departments/ academicians/ stakeholders/ representative from Central Government to discuss Management Action Plans and review conservation activities undertaken from time to time.

- Three Scientists (Mr. Rajendra Kumar, MoEF, Dr. Deepak A. Apte, BNHS, and Dr. Richa Pandey, GEER Foundation) have been selected by the Ministry for Post Graduate programme on 'Integrated Coastal Zone Management' at Asian Institute of Technology, Bangkok, Thailand.
- Regional Training Course on Project Cycle Management for 37 participants from 10 countries under MFF Programme in November, 2010 was held at Chennai.
- 6<sup>th</sup> NCB meeting was under the chairmanship of Mr. M. F. Farooqui, Additional Secretary, MoEF on 11<sup>th</sup> January, 2011 at IUCN India Office. Various decisions on the ongoing and

proposed projects and activities for 2011 were discussed and agreed upon.

## Biosphere Reserves

### Introduction and Objective

Biosphere Reserves are areas of terrestrial and coastal ecosystems which are internationally recognized within the framework of the Man and the Biosphere (MAB) programme of the UNESCO. These Reserves are required to meet a minimal set of criteria and adhere to a minimal set of conditions before being admitted to the World Network of Biosphere Reserves designated by the UNESCO. The world's major ecosystem types and landscapes are represented in this network, which is devoted to conserving biological diversity, promoting research and monitoring as well as seeking to provide models of sustainable development in the service of human kind with special reference to the local communities which mostly consist of traditional societies.

These Reserves are rich in biological and cultural diversity and encompass unique features of exceptionally pristine nature. The goal is to facilitate conservation of these representative landscapes and their immense biological diversity and cultural heritage, foster economic and human development which is culturally and ecologically sustainable and to provide support for research, monitoring, education and information exchange. The scheme is a pioneering effort at pursuing the increasingly difficult yet urgent task of



Fig.22. Coral formation, home to many species

conserving ecological diversity under mounting pressures.

### Activities undertaken

The programme was initiated in 1986 and till date, 18 sites have been designated as Biosphere Reserves (BRs) in different parts of the country. Some potential sites have also been identified. The Ministry provides financial assistance to the concerned State/UT Governments for conservation and management of the designated Biosphere Reserves. The Indian National Man and Biosphere (MAB) Committee constituted by the MoEF is the apex body to oversee the programme, provide policy guidelines and review the programme.

Out of the 18 Biosphere Reserves designated nationally, so far seven viz., **Nilgiri** (Tamil Nadu, Kerala and Karnataka), **Gulf of Mannar** (Tamil Nadu), **Sunderban** (West Bengal), **Nanda Devi**, (Uttarakhand), **Pachmarhi** (Madhya Pradesh), **Similipal** (Orissa) and **Nokrek** (Meghalaya) have been included in the World Network of Biosphere Reserves of UNESCO. The nominations in respect of Khangchendzonga (Sikkim) and Achanakmar-Amarnank (Chhattisgarh & Madhya Pradesh) Biosphere Reserves are under active consideration of the UNESCO for inclusion in the world Network. Revised nomination form in respect of Great Nicobar (Andaman & Nicobar Islands) Biosphere Reserve is getting finalized. Efforts are on for getting remaining Biosphere

Reserves included in the World Network of Biosphere Reserves. Research and development projects are also supported in these designated Reserves.

### Progress/Achievements made during the year

Management Action Plans (MAPs) submitted by the concerned States/UT were scrutinized and sanctioned for implementation of approved items of activities.

Periodic Review 2011 Reports of Sunderban and Gulf of Mannar BRs which have completed ten years after its inclusion in the World Network of Biosphere Reserves of UNESCO are under updation to forward the same to the MAB Programme of the UNESCO, Paris. Based on the proposal submitted by the Government of Madhya Pradesh, the site Panna, covering an area of 2998.98 Km<sup>2</sup>, has been designated as Panna Biosphere Reserve.

- List of Biosphere Reserves with date of designation, area and location in the State(s)/UT is given in Table-10.



Fig-23. Common Crow (*Euploea core*), an indicator of biodiversity

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**Table-9.** Comparison of progress vis-a-vis that achieved in previous year (in case of ongoing scheme)

S. No.	Activity	2010-11	2011-12 (as on 9 <sup>th</sup> March, 2012)
1	Number of Management action plans sanctioned for implementation in the BRs	18	13
2	Completed research projects	10	2
3	Ongoing research projects	16	15
4	New BRs designated	1	1
5	Nomination sent to UNESCO for inclusion in the World Network of BRs	2	--

- Completed research projects during the period are at Annexure-IV
- Ongoing research projects during the period are at Annexure-III

### Budget allocation for the Scheme during the year and progress of Expenditure

An amount of Rs.11.00 crores was allocated and the expenditure incurred upto 9<sup>th</sup> March, 2012 is Rs.1015.83 lakhs.

### Implementing organizations along with details of responsibilities

Implementing organizations are the concerned State(s)/UT Government Forest Departments and other line Departments. The approved items of the activities by the Central Government from the recommended items by the State/UT Level Steering Committee chaired by Chief Secretary/ concerned Principal Secretary are being monitored by their monitoring Committee, the designated BR manager and the Eco development Committees/ JFM represented by the local communities.

Universities, Research Institutions, State Forest Research Institutions, Autonomous bodies are conducting research activities on the sanctioned research projects in the BR areas and the periodic progress and review

reports are evaluated by experts and evaluation of the completed research projects is carried out by the designated committee.

### Biodiversity Conservation

To ensure coordination among various agencies dealing with the issues related to conservation

of biodiversity and to review, monitor and evolve adequate policy instruments for the same. .

### Progress/achievements during the year

#### Convention on Biological Diversity

- The Convention on Biological Diversity (CBD), one of the key agreements adopted during the Earth Summit held in Rio de Janeiro in 1992, is the first comprehensive global agreement which addresses all aspects relating to biodiversity. The CBD, which has near universal membership with 193 countries as its Parties, sets out commitments for maintaining the world's ecological underpinnings, while pursuing economic development. The Convention, while reaffirming sovereign rights of nations over their biological resources, establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the use of genetic resources. India is a signatory to the CBD, which reaffirms the sovereign rights of the States over their Biological Resources.
- Following the decision of the tenth

**Table-10.** List of Designated Biosphere Reserves

S. No	Name of the BR & total geographical area (km <sup>2</sup> )	Date of designation	Location in the States /UT
1.	<b>Nilgiri (5520)</b>	01.08.1986	Part of Wynad, Nagarhole, Bandipur and Madumalai, Nilambur, Silent Valley and Siruvani hills (Tamil Nadu, Kerala and Karnataka)
2.	<b>Nanda Devi (5860.69)</b>	18.01.1988	Part of Chamoli, Pithoragarh & Almora Districts in Uttarakhand
3.	<b>Nokrek (820)</b>	01.09.1988	Part of East, West and South Garo Hill districts in Meghalaya
4.	Manas (2837)	14.03.1989	Part of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darang districts in Assam.
5.	<b>Sunderban (9630)</b>	29.03.1989	Part of delta of Ganges & Brahmaputra river system in West Bengal.
6.	<b>Gulf of Mannar (10500)</b>	18.02.1989	India part of Gulf of Mannar extending from Rameswaram island in the North to Kanyakumari in the South of Tamil Nadu.
7.	Great Nicobar (885)	06.01.1989	Southern most island of Andaman and Nicobar Islands.
8.	<b>Similipal (4374)</b>	21.06.1994	Part of Mayurbhanj district in Orissa.
9.	Dibru-Saikhowa (765)	28.07.1997	Part of Dibrugarh and Tinsukia districts in Assam
10.	Dehang Debang (5111.5)	02.09.1998	Part of Upper Siang, West Siang and Dibang Valley districts in Arunachal Pradesh.
11.	<b>Pachmarhi (4981.72)</b>	03.03.1999	Part of Betul, Hoshangabad and Chhindwara districts in Madhya Pradesh.
12.	Khangchendzonga ( 2619.92 )	07.02.2000	Part of North and West districts in Sikkim
13.	Agasthyamalai (3500.36)	12.11.2001	Part of Thirunelveli and Kanyakumari districts in Tamil Nadu and Thiruvanthapuram, Kollam and Pathanamthitta districts in Kerala.
14.	Achanakmar-Amarkantak (3835.51)	30.03.2005	Part of Anuppur and Dindori districts of Madhya Pradesh and Bilaspur district of Chhattisgarh.
15.	Kachchh (12,454)	29.01.2008	Part of Kachchh, Rajkot, Surendranagar and Patan districts in Gujarat.
16.	Cold Desert (7770)	28.08.2009	Pin Valley National Park and surroundings; Chandratol & Sarchu; and Kibber Wildlife sanctuary in Himachal Pradesh.
17.	Seshachalam (4755.997)	20.09.2010	Seshachalam hill ranges in Eastern Ghats encompassing part of Chittoor and Kadapa districts in Andhra Pradesh.
18.	Panna (2998.98)	25.08.2011	Part of Pann and Chhattarpur districts in Madhya Pradesh

\* Sites with bold letters have been included in the World Network of BRs of UNESCO.



Fig-24. Glassy Tiger (*Parantica aglea*)

Conference of the Parties (CoP-10) to the CBD held in Nagoya, Japan in October 2010, accepting India's offer to host the next CoP to the CBD, preparations for organization of CoP-11 were initiated. Necessary clearances from political and security angles were obtained from the Ministries of External Affairs and Home Affairs, respectively. Adopting a tender process, the venue of CoP-11 was decided as Hyderabad International Convention Centre in Hyderabad. An SFC memo for hosting CoP-11 was prepared and after approval, the financial proposal was cleared by the Cabinet. The process of selecting a Professional Conference Organiser has been initiated and is underway.

- For preparation of logo and slogan of CoP-11, the services of National Institute of Design, Ahmedabad were commissioned. The logo along with the slogan of CoP-11 in Sanskrit 'Prakriti Rakshati Rakshita' (Nature Protects if She is Protected) was released by the Minister for Environment & Forests during high-level event, the National Consultation of Stakeholders on

Biodiversity, organized by the Ministry on 23rd May, 2011 to launch the UN Decade for Biodiversity for the Asia & Pacific.

- A multi-tier coordination mechanism has been developed for reviewing the progress in preparation for CoP-11. A meeting of the National Steering Committee co-chaired by the Chief Minister of Andhra Pradesh and the Minister for Environment & Forests was held on 6<sup>th</sup> June, 2011, the next meeting is scheduled to be held in January 2012.

Meetings of National Working Group co-chaired by the Chief Secretary, Government of Andhra Pradesh and Secretary (E&F) and an Interministerial Steering Committee chaired by Secretary (E&F) are held regularly. The Government of Andhra Pradesh has constituted a CoP Cell under the chairmanship of Additional Chief Secretary with representation of all relevant Departments.

- The Executive Secretary of CBD Secretariat visited the CoP-11 venue in October 2011, and met senior officers of the Ministry and Government of Andhra Pradesh. This was followed by the visit of UN Security and CBD Conferencing teams in November 2011.
- Discussions are being held with various stakeholders on CoP-11. An innovative means to create mass awareness on biodiversity, the Science Express Biodiversity Special team is being developed as a collaborative efforts between Department of Science & Technology and this Ministry.
- As per the past practice, as a part of CoP-11, India will also host a high level

segment of CoP-11 on the last three days from 17-19 October 2012. India has identified the following five themes for discussion in the high level segment:

- Biodiversity and livelihoods
- Integration of value of biodiversity in national planning and accounting process
- Strategy for resource mobilization
- Coastal and marine biodiversity
- Operationalisation of Nagoya Protocol
- Invitations have been sent from the Minister for Environment & Forests to Environment Ministers of all countries for the high level segment. The Prime Minister of India has been requested to inaugurate the high level segment.
- As incoming President of CoP-11, India is also hosting some important preparatory intersessional meetings, the outcomes of which will feed into CoP-11. These include:
  - Subregional workshop for capacity building on Protected Areas held at Wildlife Institute of India, Dehradun from 6-10 December 2011
  - Second Subregional workshop on updating National Biodiversity Strategies and Action Plans held at Wildlife Institute of India - Dehradun from 6-10 December 2011.
  - Subregional capacity building workshop on Clearing House Mechanism held at Forest Survey of India, Dehradun from 12-16 December 2011
  - Expert Group meeting on biodiversity for poverty eradication and development held at Forest Research Institute, Dehradun from 12-14 December 2011
- In addition to the above, the Second meeting of Intergovernmental Committee

on Nagoya Protocol (ICNP-2) is being hosted by India in New Delhi from 7-13 April, 2012. It is also proposed to organize capacity building workshops on ABS for African and ASEAN regions.

- On the sidelines of CoP-11, a number of parallel events would be held, such as side events, interactive fair and exhibition, International Youth Forum, Cities and Biodiversity Summit, Business and Biodiversity meet etc.
- 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.
- India, a recognized megadiverse country, has developed a strong legal and policy framework on biodiversity, and is recognized globally as a pioneer and trendsetter in biodiversity issues. Hosting of CoP-11 provides an opportunity to augment and showcase India's strengths on biodiversity, thereby facilitating the process of India emerging as a leading voice in biodiversity conservation while defining and driving the global agenda in the coming years.
- Subsequent to the adoption of the Nagoya Protocol on Access and Benefit Sharing at CoP-10 under the aegis of CBD, action was initiated for signing of the Nagoya Protocol. A draft note for the Cabinet was prepared, circulated to the concerned Ministries / Departments, and upon completion of interministerial consultations, submitted to the Cabinet. After Cabinet's approval, the Nagoya Protocol was signed by India on 11<sup>th</sup> May, 2011. Thereafter, action has been initiated for ratification of this Protocol. Interministerial

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- consultations on the draft Cabinet note prepared for this purpose are underway. Parallely, consultations are also being held with the experts to examine the provisions of the Nagoya Protocol vis-à-vis the Biological Diversity Act.
- In pursuance of various decisions of CoP-10 to the CBD, India has been responding to various notifications being received from the CBD Secretariat, inter alia by making submissions, and nominating experts for various expert meetings. India has also initiated action in accordance with the CoP-10 decisions on some of the issues such as setting of national targets, and updating of India's National Biodiversity Action Plan in line with the Strategic Plan on Biodiversity. During the year, action was also initiated for a national study on the lines of the global study on The Economics of Ecosystems and Biodiversity (TEEB). Towards this, a two-day expert consultation workshop on India TEEB was organized by the Ministry at the Indian Institute of Forest Management, Bhopal on 15 and 16 September 2011.
  - During the year, Indian delegations participated in important meetings organized by the CBD. These included:
    - Asia Regional workshop on biodiversity and finance in support of Nagoya outcomes held in Da Lat City, Vietnam on 8<sup>th</sup> April, 2011
    - Expert meeting on modalities of operation of ABS Clearing House held in Montreal from 11-14 April 2011
    - Subregional workshop on updating of National Biodiversity Strategy and Action Plan held in Xian, China from 9-16 May, 2011
    - First meeting of Intergovernmental Committee on Nagoya Protocol (ICNP-1) held in Montreal from 6-10 June 2011
  - Meeting of CoP Presidencies held in Geneva on 3<sup>rd</sup> September, 2011
  - Seventh meeting of Working Group on Article 8j, and fifteenth meeting of SBSTTA held in Montreal from 31<sup>st</sup> October -4<sup>th</sup> November and 7-11 November, 2011
  - Subregional workshop for capacity building on Protected Areas held at Wildlife Institute of India, Dehradun from 6-10 December 2011
  - Second Subregional workshop on updating National Biodiversity Strategies and Action Plans held at Wildlife Institute of India - Dehradun from 6-10 December 2011.
  - Subregional capacity building workshop on Clearing House Mechanism held at Forest Survey of India, Dehradun from 12-16 December 2011
  - Expert Group meeting on biodiversity for poverty eradication and development held at Forest Research Institute, Dehradun from 12-14 December 2011
  - Some other CBD meetings in which India is likely to participate during the year include: Expert meeting on compliance with Nagoya Protocol to be held at Montreal from 28<sup>th</sup> February to 1<sup>st</sup> March 2012; Dialogue seminar on scaling up finance for biodiversity to be held at Quito, Ecuador from 6-9 March 2012; and Global workshop on national experiences in implementing Strategic Plan for Biodiversity 2011-2020 to be held at Brasilia from 12-14 March 2012.
  - India, as the incoming Presidency of CoP-11 is an Observer on CoP Bureau, and attends its meetings. India has also been selected as one of the two countries to represent the Asia Pacific region on

the Bureau of ICNP.

### Biological Diversity Act, 2002

- Taking cognizance of the International Convention on Biodiversity (CBD), and to address the excessive pressure on biodiversity, the Government of India has enacted Biological Diversity Act, 2002 (BDA 2002). Accordingly, the national, state and local level mechanisms have been provided for implementation of the Act. At the national level, National Biodiversity Authority (NBA) has been established by Government of India in October, 2003 at Chennai (Tamil Nadu) under Section (8) of the Biological Diversity Act. The State Biodiversity Boards (SBB) have been established by the State Governments and Biodiversity Management Committees (BMC) constituted by the local bodies.
- The NBA is a body corporate established in accordance with the provisions of Sec.8 of the Biological Diversity Act, 2002, at Chennai w.e.f. 1<sup>st</sup> October 2003. It is an autonomous, statutory and regulatory organization which is intended to implement the provisions of Biological Diversity Act, 2002.
- Twenty-five States have so far set up the State Biodiversity Boards (SBBs). The matter is being pursued with Bihar, Maharashtra and Jammu & Kashmir which have yet to set up SBBs. Fourteen states viz. Arunachal Pradesh, Andhra Pradesh, Gujarat, Rajasthan, Karnataka, Kerala, Madhya Pradesh, Manipur, Sikkim,

West Bengal, Tripura, Uttar Pradesh, Maharashtra and Assam have notified the state specific rules in accordance with the Section 63(1) of the Act.

- So far, over 31000 BMCs have been constituted by the local bodies in 14 states (Andhra Pradesh, Himachal Pradesh, Karnataka, Madhya Pradesh, West Bengal, Kerala, Goa, Nagaland, Manipur, Uttar Pradesh, Gujarat, Punjab, Mizoram and Tripura) and 932 PBRs have been documented in eight states (Andhra Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Manipur, Uttarakhand and West Bengal), of which 189 PBRs have been prepared during the year.
- During the year, four meetings of the Authority were held on 04<sup>th</sup> May, 2011, 20<sup>th</sup> June, 2011, 09<sup>th</sup> August, 2011 and 22<sup>nd</sup> November, 2011, and important decisions were taken on different matters. Forty four applications were received and are at various stages of processing during the period.
- The process of selection of the new Chairman of NBA was completed, and Dr Pisupati Balakrishna joined as Chairman, NBA on 12<sup>th</sup> August, 2011.



Fig-25. Lemon Pansy, (*Junonia lemonias*)



Fig-26. An agamid lizard (*Calotes maria*) - Found only in Lengtung Wildlife Sanctuary (Mizoram) and Meghalaya.

- Some of the important actions taken up during the year to implement various provisions of the Act include the following:
  - In pursuance of Section 38 of the Act relating to notification of threatened species, the Ministry has notified species which are on the verge of extinction for three States, namely, Bihar, Tamil Nadu and Tripura, during the year, taking the number of States to 14.
  - In accordance with Section 37 relating to notification of Biodiversity Heritage Sites during the year, the Government of Karnataka has notified three more such sites at Hogrekan, University of Agricultural Sciences, GKVK campus, and Ambargudda.
- NBA and MoEF organized a discussion meeting with various stakeholders at Chennai on 18<sup>th</sup> October, 2011 to discuss the agenda and country position for CBD meetings on 8j Working Group and SBSTTA-15.
- NBA conducted an expert meeting on Nagoya Protocol and its relevance to

Biological Diversity Act, in the context of ratifying the Nagoya Protocol in New Delhi on 26<sup>th</sup> November, 2011.

- A meeting of the State Biodiversity Boards held at Chennai in January 2012.
- A UNEP/GEF project on Strengthening the implementation of Biological Diversity Act to be implemented by MoEF through NBA was launched on 23<sup>rd</sup> August, 2011 at Chennai. The project would be implemented in five States (Andhra Pradesh, Gujarat, Arunachal Pradesh, Sikkim and West Bengal). State level launches of the project were held in Andhra Pradesh and West Bengal in November and December 2011, respectively.
- Work was continued under the UNDP project on Strengthening the institutional structures to implement the Act in Madhya Pradesh and Jharkhand.
- Work was also continued for developing a full scale project on established of a Centre for Biodiversity Policy and Law (CEBPOL) at NBA, Chennai, with technical support from Norway.
- NBA sponsored and supported activities of the SBBs to celebrate the International Biodiversity Day on 22<sup>nd</sup> May, 2011.

### **Biodiversity Scheme / Genetic Engineering Approval Committee (GEAC)**

#### **Introduction and objectives**

The Ministry of Environment and Forests (MoEF), under the Environment (Protection) Act 1986, has notified the "Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically

Engineered Organisms or Cells 1989" (known as Rules, 1989) with a view ensure sound application of biotechnology making it possible to accrue benefits arising from modern biotechnology while minimizing the risks to environment and human health.

The rules also cover the application of hazardous microorganisms which may not be genetically modified. Hazardous microorganisms include those which are pathogenic to animals as well as plants.

The Genetic Engineering Appraisal Committee, the apex body under the Rules, 1989 has the mandate to accord approval of activities involving (i) large scale use of genetically modified organisms (GMOs) in research and (ii) environmental release of GMOs. Eight meetings of the GEAC have been held from April, 2011 till December 2011.

The overall objectives of the program is to ensure that research and development and testing of LMOs prior to environmental release are conducted in a safe and scientific manner through appropriate implementation of Rule 1989 and biosafety guidelines notified therein;

### Progress/Achievements made during the year

#### Commercial Release of transgenic Crops

Bt cotton hybrids expressing Cry 1 Ac gene (MON 531 event) and stacked genes *Cry1 Ac* and *Cry 2Ab* (MON 15985 event)-BG-II developed by M/s Mahyco; encoding fusion genes (*cry 1Ab+Cry Ac*) 'GFM developed by M/s Nath Seeds; *cry 1Ac* gene (Event-1) developed by M/s J. K. Agri Genetics Ltd; *Cry 1Ac* gene (Dharwad event) developed by Central Institute of Cotton Research (CICR); and *Cry 1C* (event 9124) developed by M/s Metahelix Life Sciences are currently under commercial cultivation in India.

During Kharif 2011, the Standing Committee constituted by the GEAC under the 'Event Based approval Mechanism' has recommended 106 Bt cotton hybrids for commercial cultivation.

#### Status of approval of other GM crops in India

- The biosafety data submitted by M/s Dow Agro-sciences India Pvt. Ltd for environmental release of two transgenic 'Widestrike' cotton hybrids namely; WS 103 and WS 106 expressing Cry 1Ac and Cry 1F genes (Event 281-24-236) in South Zone is under review by the GEAC.
- BG-II RRF cotton expressing *cry-I Ac* and *Cry-2 Ab* and *CP-4 EPS* (event MON 15985 X MON 88913) developed by M/s Mahyco and transgenic corn expressing *cry2Ab2*, *cry1A 105* (Event MON 89034) & *CP4EPS* (Event NK603) by M/s Monsanto India Ltd have entered Biosafety Research Level-II trials with the approval of GEAC.
- In addition, other GM crops such corn, rice, tomato, potato, castor, rubber, cotton, brinjal, mustard, groundnut, sorghum, okra, wheat, watermelon, papaya, sugarcane, banana and pigeon pea have been approved by the GEAC for field testing to identify suitable events and generation of biosafety data. However, in view of objections raised by some State Governments, the applicants have been directed to obtain NOC from the State Governments where the trials are to be conducted before issuance of the approval letter. In view of this new requirement, currently field testing of only cotton, mustard and corn have been initiated.
- As a follow-up to the moratorium on Bt brinjal, the Ministry has received several reports from both nation and international experts on the merits and demerits of

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GM crops in general and Bt brinjal in particular. A meeting of the GEAC to consult with experts and scientists on the safety of Bt. Brinjal was held on April, 27, 2011. Several of the Experts recommended "*Limited release of Bt seeds to identified farmers under strict expert supervision should be undertaken to evaluate its performance in public space. In the interim period additional studies may be prescribed*". But some experts wanted additional studies to be done before release. In the absence of consensus, the GEAC has decided to have further consultation with experts on the suggestions for additional studies.

### **Streamlining of the Biosafety Regulatory Procedure under Rules, 1989.**

- The Gazette Notification exempting GM processed food and products thereof from the purview of Rules, 1989 issued on 15<sup>th</sup> October, 2007 has been kept in abeyance till 30<sup>th</sup> September, 2012
- Review of the existing national regulatory biosafety framework with a view to harmonize the obligations under Cartagena Protocol on Biosafety (CPB) is in progress.
- Draft guidance document for information/data generation and documentation for safety assessment of GE Plants during biosafety research level trials -I (BRL-I) and biosafety research level trials -II (BRL-II) has been prepared and is awaiting GEAC approval.
- Development of new GEAC website and backend biosafety database to operationalize the new biosafety website is in progress.
- Biological documents for Cotton, Brinjal, Okra, Maize and Rice have been published.

- Study on "Monitoring the development of insect resistance to Bt gene in cotton crop" by CICR is in progress.
- South-Asia Conference on Current Approaches to the Environmental Risk Assessment (ERA) of Genetically Engineered Crops was held on 16-18<sup>th</sup> May, 2011 at New Delhi.
- To enhance awareness on biosafety regulation and associated activities at the domestic and international level, the Ministry has introduced electronic 'Biosafety Newsletter'. So far three issues have been introduced and circulated across 4000 stakeholders. The online version is available on the GEAC website (<http://moef.nic.in/divisions/csurv/geac/information.html>).

### **Regulatory Acts/Rules governing the programme and promulgation of new acts, if any, along with the details**

Under the Environment (Protection) Act, 1986, the Rules for Manufacture, Use/Import/Export & Storage Of Hazardous Micro Organisms/ Genetically Engineered Organisms or Cells, 1989 were notified by MoEF through Notification No. 621 in Official Gazette of Govt. of India on December 5, 1989.

The implementation of Rules 1989 is being administered by the Ministry of Environment and Forests (MoEF) and Department of Biotechnology (DBT). These rules define the competent authorities and composition of such authorities for handling of various aspects of the rules. Presently there are six Competent Authorities i.e. The Recombinant DNA Advisory Committee (RDAC), Institutional Biosafety Committee (IBSC), Review Committee on Genetic Manipulation (RCGM), Genetic Engineering Approval Committee (GEAC), State Biotechnology Coordination Committee (SBCC), District Level Committee (DLC). While RDAC has an advisory role, IBSC, RCGM

and GEAC are involved in regulations and SBCCs and DLCs are involved in monitoring.

### Implementing organizations along with details of responsibilities

Rules 1989 is implemented by MoEF, Department of Biotechnology (DBT), Ministry of Science and Technology. MoEF is primarily responsible for conservation and protection of environment, ensuring environmental and human health safety before release of genetically modified organisms (GMOs) and products thereof. The mandate of the DBT is to promote biotechnology, provide services in areas of research, infrastructure, generation of human resource and formulation of guidelines and protocols for safety assessment of GMOs.

Under the Rule, approval for research and Biosafety Regulation Level-I (BRL-I) confined field trial of transgenic plants are being regulated by RCGM, administered by Department of Biotechnology (DBT). Whereas, BRL-II trial and environmental release of transgenic crops are appraised and approved by GEAC administered by MoEF.

### Biodiversity Scheme/ Cartagena Biosafety Protocol

#### Objective

The Cartagena Protocol on Biosafety, the first international regulatory framework for safe transfer, handling and use of living Modified Organisms (LMOs) was negotiated under the aegis of the Convention on Biological Diversity (CBD). The Protocol was adopted on 29<sup>th</sup> January 2000. India has acceded to the Biosafety Protocol on 17<sup>th</sup> January 2003. The Protocol has come into force on 11<sup>th</sup> September 2003. As of date 162 countries are Party to the CPB. Five meetings of the Conference of Parties serving as Members of the Parties to the Cartagena Protocol (COP-MOP) on Biosafety have been held so far. The Sixth meeting of COP-MOP is being hosted by India at Hyderabad from 1<sup>st</sup>-5<sup>th</sup> October, 2012.

The main objective of the Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of LMOs resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use biological diversity, taking into account risk to human health.

#### Progress/achievements made during the year

- India became a signatory to the recently adopted 'Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress under Cartagena Protocol on Biosafety' on 11<sup>th</sup> October 2011, subsequent to the cabinet approval. As of date 36 countries are signatory to the Supplementary Protocol. Only one country Latvia has ratified the Supplementary Protocol
- The process of ratification has been initiated by the Ministry for which a study has been commissioned to probe the legal implication of ratification of the Supplementary Protocol by India.
- The Second National Report on implementation of CPB by India has been submitted. The report was prepared and validated through a series of consultation meetings with experts and stakeholders organized by the Ministry.

#### Preparation for sixth meeting of Conference of Parties serving as Meeting of Parties (COP-MOP-6) to Protocol being held in October 2012 in India

- Three preparatory Regional Workshops for COP-MOP-6 were successfully organized under the aegis of Convention on Biological Diversity in Delhi. These include:
  - Workshop on Capacity-Building for Research and Information Exchange on Socio-Economic Impacts of Living

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Modified Organisms under Cartagena Protocol on Biosafety, 14-16<sup>th</sup> November 2011

- Asia-Pacific Regional Workshop on the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety, 17-18<sup>th</sup> November 2011
- Asia Sub-Regional Training of Trainers' Workshop on the Identification and Documentation of Living Modified Organisms, 21-25<sup>th</sup> November 2011

### Capacity Building

The Ministry has received GEF approval to the 'Full Scale Project' (FSP) document for UNEP-GEF Externally Aided Project on capacity building in biosafety. The process for setting up of Project Coordination and Monitoring Unit has been initiated. Project inception workshop is tentatively scheduled in March, 2012.

To enhance awareness among various stakeholders; three training workshops on use of Biosafety Clearing House (BCH) as a tool for providing information on LMOs was organised with GEF-UNEP assistance.

### All India Coordinated Project on Capacity Building in Taxonomy (AICOPTAX)

Taxonomy occupies the position of a mother science in biology as it deals with the classification of all living and extinct organisms. Therefore, it is a key science to help ensure sustainable utilization, conservation of biological resources and implementation of the Convention on Biological Diversity (CBD). There is an overall decline in expertise in the taxonomy of several groups of living organisms. Moreover, the existing taxonomic base is eroding rapidly due to non-availability of professionals and lack of trained man-power to replace the

retiring specialists. In other words, a wide gap exists between the magnitude of taxonomic expertise needed and the available limited taxonomic knowledge base. Further, many microbes, plants and animals are yet to be discovered and identified. To manage the biological resources and to meet the challenges of 21<sup>st</sup> century, the issue of 'taxonomic impediments' needs to be addressed urgently.

For devising effective conservation and management strategies, one needs to know: (i) what kind of species are found, (ii) where they occur, (iii) what are their characteristics or attributes, and (iv) how they are related to one another. These questions can be answered only by specialists. Besides the basic inputs needed for understanding biodiversity, the taxonomic studies also result in weaving the data obtained on the species into a system of classification which is used by the scientists and others.

Taxonomy is also central to and an integral part of the conservation and sustainable utilization of biological diversity. It is this aspect that led the Convention on Biological Diversity (CBD) to emphasize the role of taxonomy in its implementation at the national, regional and global level. As a signatory to the CBD, India stands committed to capacity building in taxonomy and to undertake exploration and preparation of an inventory of living organisms. So far around 91,000 species of animals and 45,500 species of plants have been identified and described but a large number of animals and plants are yet to be explored, identified and described. India started building capacity in Taxonomy much before the Global Taxonomic Initiative (GTI) coming into existence, through overall strengthening of Botanical and Zoological surveys, as well as, in 1999 launching a dedicated All India Coordinated Project on Capacity Building in Taxonomy (AICOPTAX) by the Ministry.

The AICOPTAX has a sole mission - "Enhancement of country's capabilities for inventorying, monitoring, conserving and utilizing biodiversity as well as for establishing leadership in the field of taxonomy at regional and global levels". AICOPTAX, an active programme channelized at the national level to address the problems of inadequate taxonomic knowledge due to limited number of taxonomists available in the country, is fully funded by the MoEF. It has the following main objectives:

- Survey, collection, identification and preservation of elements of biodiversity of the country with emphasis on protected areas.
- Training research fellows and college teachers by building capacity in the field of taxonomy.
- Maintain collections and taxonomic data banks.
- Develop identification manuals.
- Generate information needed for decision making in conservation and sustainable use of biological diversity.
- Integration of taxonomic capacity into the national reporting process.
- Enhance local and regional capacity in taxonomy.

To start with, 30 thematic areas were chosen for investigation under the AICOPTAX. These were:

1. Plant viruses
2. Animal viruses
3. Pathogenic bacteria
4. Non-pathogenic bacteria
5. Pathogenic fungi
6. Non-pathogenic fungi
7. Fresh water phytoplankton/Algae(including blue green algae)
8. Fresh water zooplankton (including euglenoids/ciliates/rhizopods)
9. Lichens
10. Bryophytes

11. Orchids
12. Palms
13. Grasses and bamboos
14. Pteridophytes and gymnosperms
15. Research in plant biosystematics and advanced training in taxonomy
16. Helminthes and Nematodes
17. Crustacea
18. Mollusca
19. Insects: coleoptera
20. Insects: hymenoptera
21. Insects: blateria and tettigonids
24. Insects: miscellaneous order
25. Arachnida
26. Oomycetes and cellular slime moulds
27. Protozoa and sporozoa
28. Annelida
29. Meiofauna
30. Research in animal biosystematics and advanced training in taxonomy

Of the aforesaid 30 thematic areas, only 15 could be implemented so far. The work of the thematic areas of AICOPTAX was assigned to 15 coordinators along with 61 collaborators. The coordinators also oversee and monitor the activities for achieving the aims and objectives outlined in the thematic areas.

The remaining 15 thematic areas are in the process of being taken up for investigation under AICOPTAX in phased manner.

The Ministry, with the technical support from BSI & ZSI, has brought out a Programme Brief on Taxonomy Capacity Building: Indian Initiative (based on outcome of research work done under 76 projects between 1999-2007 embodying 570 species new to science), as a showcase document by Government of India during the 10<sup>th</sup> Conference of Parties to the Convention on Biological Diversity held in October, 2010 at Nagoya, Japan.

The Steering Committee for the AICOPTAX Scheme has been extended until 03<sup>rd</sup> July, 2013 along with the continuation

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of a Project Monitoring Unit (PMU). A meeting of the Steering Committee was held on 13<sup>th</sup> February, 2009 during which the entire scheme was reviewed and following five new thematic areas have been proposed for implementation:

- Crustacea
- Coleoptera
- Hymenoptera
- Arachnidae
- Floristic and Faunistic Surveys of North Eastern Region of the Country

Accordingly, three projects have been conceived under the thematic area Crustacea; six projects under Coleoptera; six projects under Hymenoptera; four projects under Arachnidae; fourteen projects under Floristic Surveys of North Eastern Region and one project under Faunistic Survey in the North East Region of the country. These are being processed in consultation with Integrated Finance Division of the Ministry for sanction and release of funds during the current financial year.

### **GOI-UNDP CCF-II project "Biodiversity Conservation through Community based Natural Resource Management"**

The project envisages to encourage communities to take responsibility for managing their Natural resources and recognize use of traditional and community knowledge to secure biodiversity-based livelihoods. The project envisages to facilitate the process of making the national and state-level policies and programmes more responsive to linkages between sustainable rural livelihoods and biodiversity conservation and to enhance the capacity of communities and institutions of decentralized governance.

The project is being implemented in four states namely Arunachal Pradesh, Chhattisgarh, Jharkhand, and Orissa. The project started in September 2008 for a

duration of three years and was subsequently further extended till 31<sup>st</sup> December, 2012. A total sum of approx Rs. 13.50 Crores (US\$ 3 Million) is allocated under the project. These four states have large stretches of forest that are controlled and managed by the communities and development of alternative sources of income assumes importance as the communities depend mainly on the natural resources for their livelihoods.

The project aims to focus on components like conservation of species and habitats through community-based management; Ecological restoration; gender equity and resource rights over common pool resources; Revitalization of indigenous knowledge, equitable customary laws and practices and ethical values recognizing socio-economic and gender differences; Nurturing existing as well as new self-governing community institutions following principles of participatory decision-making, gender and social equity. Keeping these issues in background, the project envisages with following objectives-

- To facilitate the process of making the National and state-level policies and programmes more responsive to linkages between sustainable rural livelihood
- To enhance the capacity of communities and institutions of decentralized governance for integrating sustainable biodiversity based livelihoods through participatory micro planning, while ensuring equity, transparency and accountability.

### **Comparison of progress vis-a-vis that achieved in previous year**

In the current year the *in-situ* conservation is being carrying out in more than 23,000 ha area, 3 new nurseries including 1 high altitude established and more than 15 skill strengthening and capacity building programmes organized in all four states. Fourteen NTFP and agro-forestry based micro-enterprises established during previous year

are also being supported and maintained during current year.

### Progress/Achievements made during the year

The details of state-wise physical progress made during the period are as follows:

#### Arunachal Pradesh

- The dependence of the local tribal population on forest for fuel and fire-wood reduced through LPG distribution to 120 users. A large number of Awareness programmes conducted though celebration of different environment related days (Biodiversity day, earth day, ozone day etc.) involving school children, members of BMCs & NGOs Govt. officials and local communities.
- Twenty two Biodiversity Management Committees (BMCs), a Locally elected community institution for village level biodiversity management strengthened in project villages. These BMCs were recognized by the State Biodiversity Board for future assistance and legal support.
- The in-situ and ex-situ conservation of Biodiversity is being done through various forestry related activities in about 5000 ha by bringing the area under community conserve Area (CCA) and scared groves. Six Nurseries (Two high altitude nursery) developed for raising medicinal, aromatic and horticulture Plants. The guidelines is being prepared on 'Home stay Operators under eco-tourism' and 'Management of CCAs' as inputs for State level policy frame work in Arunachal Pradesh.



Fig-27. Hot Water Spring, Golaghat, Assam

#### Odisha

- The in-situ and ex-situ conservation of biodiversity completed through silvicultural operations in 150 ha and conservation of Cane (*Calamus spp*) in about 100 ha in Khurda; fire line operations in 100 and 250 ha in Berhampur and Sambhalpur respectively.
- Sixteen awareness progrmmes conducted though celebration of various environment related days (Forestry Week, Biodiversity day, Water day etc.) Involving tribal school children, members of village conservation committees (VCCs) , NGOs, Govt. officials and local communities in all sites. More than 100 village level meeting and consultation were organized in all three sites. Human Health camps and livestock health camps (1 No. each) organized in all three sites. Vocational training on Strengthening of farmers club, seed purification and incense stick making completed in Sambhalpur. Three Exposure visits were organized for members of VCCs and villagers for cross learning experiences.

- Additional livelihood support to local communities were provided through strengthening of Tailoring enterprise in Khurda; distribution of Agriculture implements, HYV seeds, fertilizer insecticide and pump sets to farmers along with Construction of warehouse and drying yard at Sambhalpur, installation of Rice puff machine, introduction of about 1.2 lakhs of fingerlings of two local variety of fish and construction of Four country boats & Two thatched sheds in Berhampur site.

### Chhattisgarh

- The in-situ and ex-situ conservation of Biodiversity completed through various forestry related operations in about 19,000 ha. Resource survey, ethno-botanical survey and documentation of flora of herbal health value and ITK Completed and activities related to establishment of Seed bank/grain bank has been started in all 3 sites. Nineteen water holes constructed for wildlife in project sites sites.
- Awareness programmes conducted through celebration of various environment related days through street palys, slogan writing etc. and also on organic certification involving tribal school children, members of SHGs and cooperative federation & NGO's Govt. officials and local communities in all sites. Nine Self Help Groups (SHGs) driven micro-enterprises mainly based on NTFPs and forestry related activities were supported in all three sites.
- Three Herbal Health care (Van Ausdhalaya) were strengthened, functioning well in all three sites with active participation of local vaidhyas. The certification process of Giloe (*Tinospora cordifolia*) started in Jagdalpur. A Three days training

programme was organized at jagdalpur for Traditional Healers (Local Vaidhyas) with the help of AYUSH.

### Jharkhand

- The in-situ and ex-situ conservation of Biodiversity completed through revival and maintenance agro- forestry plantation in 82 acre in Palajore and 12 acre in Khunti site; development of sacred grove in 12 acre; ANR plantation in 21 ha; plantation of Fuel wood & Fodder spp in 144 ha at Triku, 8 acre in palamau site and 28 acre in Bokaro site and development of 60 BARI model multitier systems of food and fodder. People's Biodiversity Register (PBR) completed in 40 project villages .
- More than 40 village level meeting and 22 local level stakeholder meeting were organized. 248 farmers were trained on SRI technique of paddy & applied in 86 acre at Trikut site. A total of 114 families have been supported through alternate livelihood support activities including vegetables & Lac cultivation, cattle rearing, grocery etc, and out of these 56 families have repaid their seed money. Two lift irrigation units completed at Bokaro and Palamau site benefiting 44 acres and 40 acres of land respectively. One 16 bedded and two 14 bedded vermin-compost unit constructed at Palamau and Tirkut site respectively. Land and soil conservation completed through excavation of seven ponds, creation of Forty One water harvesting structure (WHS) at Trikut site and construction of three check dams.

### Budget Allocation

A total sum of approx Rs. 13.50 crores (USD 3 Million@ Rs. 45/USD) is available under the project. A grant of Rs. 943 lakhs have been released till 31<sup>st</sup> December, 2011 to four identified implementing agencies as per details given in Table-11.

**Table-11.** Budget allocation under the project

State	Coordinating Agency	Amount sanctioned for three years duration of the project	Amount released till 31 <sup>st</sup> Dec, 2010
Arunachal Pradesh	G.B. Pant Institute of Himalayan Environment & Development, N-E Unit, Itanagar	252.89	231.54
Jharkhand	Institute of Forest Productivity, Ranchi	250.00	227.02
Orissa	Regional Plant Resource Centre, Bhubaneshwar	250.00	246.14
Chhattisgarh	State Minor Forest Produce (T & D) Coop. Federation, Raipur	250.00	238.70

### Implementing organization along with details of responsibilities

The MoEF is the implementing agency of the project. At National level, a National Steering Committee (NSC) Under the chairmanship of Additional Secretary (Conservation) and an Empowered Project Steering Committee (EPSC) under the Chairmanship of Joint Secretary (Conservation) have been constituted for overall coordination and implementation of the project. A National Project Director (NPD), has been designated and a Project Management Unit (PMU), has been established at MOEF for administrative support to the Project. The NSC lay down the guidelines for the project implementation and also reviews the progress periodically. The EPSC approves the Annual work plan and expenditure as per approved budget and also provides the feedback for review the progress by NSC. The details of the state level coordinating agencies in four identified states are given in the Table 11.

### Assistance to Botanic Gardens

The scheme on Assistance to Botanic Gardens, Botanic sections in popular gardens

and Centers of Ex-Situ Conservation of rare, endangered, threatened and endemic plants was initiated in 1992. One time financial assistance is provided to identified Botanic Gardens and Centres of Ex-situ Conservation for improvement of their infrastructural facilities to facilitate ex-situ conservation of rare endangered, threatened endemic plants.

Under the scheme, 268 projects have been supported so far to various organizations maintaining botanic gardens and Centres of ex-situ conservation. This is gradually helping in facilitating ex-situ conservation of rare endemic plants. A detailed guideline has been issued for guidance of proponents.

The Ministry has reconstituted the Expert Group on the scheme in January, 2012. The Expert Group identifies and recommends proposals received for financial assistance under the scheme and also monitors and reviews progress of the sanctioned projects. The Botanical Survey of India also helps in field evaluation of these projects through its regional centres. During the year, 4 (four) projects have been approved for funding. Based on the criteria prescribed in the guidelines, 'Lead Gardens' are being developed in different phyto-geographic zones

of the country to provide necessary expertise for smaller gardens. A list of Lead Gardens along with their status is given in Table-12. These gardens are expected to be equipped with modern facilities to enable them to perform their responsibilities.

Four gardens were supported during the year 2011-12 under the scheme as follows:-

- Institute of Forest Productivity (IFP), Ranchi, Jharkhand - Lead Garden

- Social Forestry Division, Forest Department, Raibareli, U.P.
- Swami Keshwanand Rajasthan Agricultural University, Bikaner, Rajasthan.
- Executive Director, Pilikula Nisarga Dhama Society, Mangalore, Karnataka.

The projects under the scheme are implemented by various Government/Autonomous/Non-Government Organizations maintaining Botanical Gardens and Centres

**Table-12.** List of organizations sanctioned grant for development of Lead gardens

S. No.	Name of the Institution	Region	Date of Sanction	Total Amount Sanctioned in lakh
1.	Department of Botany, Shivaji University, Kolhapur.	North Western Ghat	2.9.2008	47.54
2.	Van Vigyan Kendra, Chessa, Papompare, SFRI, Itanagar. Arunachal Pradesh, Tele: 0360-2203560	East Himalaya	23.09.08	57.00
3.	Regional Plant Resources Centre, Neyapalli, Bhubneshwar, Orissa Tele: 0674- 2557925	Eastern Ghats	18.09.08	50.50
4.	Centre for Biodiversity Studies School of Biosciences and Biotechnology Baba Ghulam Shah Badshah University, Rajouri-185 131 J&K.	Western Himalaya	29.05.09	57.50
5.	GB Pant Institute of Himalayan Environment and Development , Kosi Katrmaal, Almora	Central Himalaya	25.03.08	34.68
6.	Centre for Arid Zone Research Institute, Jodhpur, Rajasthan	Arid Zone	17.10.08	99.02
7.	National Botanical Research Institute Ranapratap Marg, P.B. No. 436, Lucknow-226 001	Gangetic Plains	03.06.09	41.94
8.	Tropical Botanic Garden and Research Institute, Palode Trivandrum	South western Ghats	14.03.08	76.14
9.	Rapinat Herbarium and Centre for molecular Systematics and the Anglade Institute if Natural History, St. Joseph College Thiruchellapalli -620 002	Western Ghats	22.09.08	66.45
10.	University of Agriculture Science, GKVK, Bangalore -560 065	Western Ghats	03.07.09	52.44
11.	Institute of Forest Productivity (IFP) Ranchi, Jharkhand	Eastern India	20.05.2011	44.00

of Ex-situ Conservation. The progress made by these Botanic Gardens is periodically monitored by the Botanical Survey of India which also helps in identification of rare endangered, threatened and endemic plants requiring ex-situ conservation. During the year the task of indepth evaluation of the Scheme was carried out by the Indian Institute of Horticulture Research, Bengaluru.



Fig-28. Forests of Arunachal Pradesh

## Forest Conservation

### Background

The Forest (Conservation) Act, 1980 came in to effect from October 25, 1980 which provides for prior approval of the Central Government for diversion of forest lands for non-forestry purposes. In the national interest and in the interest of future generations, this Act, therefore, regulates the diversion of forest lands to non forestry purposes. The objective of the Act is to regulate indiscriminate diversion of forest lands for non forestry uses and to maintain balance between developmental needs of the country and the conservation of natural heritage. The guidelines are issued under the Act from time to time, to simplify the procedures, to cut down delays and to make the process transparent.

### Procedure for Forest Clearance

Heads of the Regional Offices of the Ministry at Bangalore, Bhopal, Bhubaneswar, Lucknow, Shillong and Chandigarh are empowered to grant approvals under the

FCA for diversion of forest land for non-forestry purposes up to 5 hectare in each case (except for mining and regularization of encroachments) and to process and make recommendations to the Ministry in cases between 5 hectare and 40 hectare in consultation with the State Advisory Committee. The proposals involving areas more than 40 ha. To be submitted by the State Governments to the Ministry, and they are examined by the Forest Advisory Committee (FAC), constituted under the Forest (Conservation) Act, 1980 and meets once a month. The present composition of the FAC is given below:

- (i) Director General of Forests & Special Secretary, Ministry of Environment & Forests ... Chairman
- (ii) Additional Director General of Forests, Ministry of Environment & Forests ... Member
- (iii) Additional Commissioner (Soil Conservation), Ministry of Agriculture ... Member
- (iv) Dr. Ullas Karanth, Centre for Wildlife Studies, Bangalore-560070 ... Member

- (v) Mr. Mahesh Rangarajan  
... Member
- (vi) Dr. Amita Baviskar, Associate Professor,  
Institute of Economic Growth, New Delhi  
... Member
- (vii) Inspector General of Forests (Forest  
Conservation), Ministry of Environment &  
Forests ... Member-Secretary

In the cases where area is more than 100 ha. Each, a site inspection by the officers of Regional Office is mandatory before the proposal is examined by the FAC. Keeping in view the recommendations of the FAC, the Ministry makes final decision on diversion proposals stipulating appropriate mitigation measures.

**Achievements made during the year**

- A statement showing the number of cases received and cleared for diversion of forest land along with forest land diverted during the years 2010-11 and 2011-12 (upto December 2012) is given in Table below.
- During the financial year 2010-11, 467 proposals were closed/ returned/ withdrawn owing to incomplete applications and rejections. Similarly during first ten months of the 2011-12, 347 proposals have been either rejected or closed/ returned/ withdrawn.

**General approval of Diversion of Forest Land for small public utility proposals**

To boost the development of underdeveloped area including tribal areas, Ministry accorded general approval under Section-2 of the Forests (Conservation) Act,

1980 for underground laying of electric cable and wires to individual household, drinking water supply/ water pipelines, telephone lines which involve felling of trees not exceeding 50 numbers per project and are outside the National Parks and Sanctuaries and are laid along the road. The approval is valid till further orders.

As a special measures to boost development of basic infrastructure in Left Wing Extremism (LWE) affected districts in the country, the general approval for diversion of the forest land for the specified public utility development projects has been further relaxed upto two hectares in each case, for a period of five years i.e. till 31<sup>st</sup> December, 2015. In addition, in the 60 worst affected districts where Integrated Action Plan is being implemented, the general approval for diversion of upto five ha. of forest land for specified developmental activities has been given.

The State Governments have been given power to issue specific approvals and conditions governing such approvals have been specified.

**Mechanism for Compensatory Afforestation**

The mitigate impacts of diversion of forest land on the ecology, environment, biodiversity and overall forest cover in the country, the Central Government while according approvals under the Forest (Conservation) Act, 1980 for diversion of forest land stipulates appropriate conditions. In addition to the requirement that the User Agency provides land in compensation, at prescribed scales, it is also made incumbent

on them to provide compensatory levies which are in the nature of funds for Compensatory Afforestation / Additional

2010-11			2011-12 (upto 31.01.2012)		
No. of cases received	Approved		No. of cases received	Approved*	
	No. of cases*	Forest area diverted (ha.)		No. of cases*	Forest area diverted (ha)
3,131	2,059	40,432	2,644	1,304	24,375

\* Includes cases received during the preceding years

Compensatory Afforestation/ Penal Compensatory Afforestation/ Safety Zone treatment / Catchment Area treatment/ Net Present Value of forest land diverted. Forest area which are notified as part of national parks/ sanctuaries are allowed to be diverted only with the express approval of the Supreme Court of India, and the User Agency is required to pay five times/ 10 times of the Net Present Value of the forest land diverted in such cases.

The funds received as compensatory levies in lieu of diversion of forest land, are held in the name of the respective State CAMPAs [Compensatory Afforestation Fund Management and Planning Authorities] and are managed by the Ad-hoc Compensatory Afforestation Fund Management and Planning Authority. The funds are being kept outside the Consolidated Fund of India and the Public Account of India in accordance with the specific orders of the Apex Court. Releases to the State CAMPAs are being made on the basis of the Annual Plans of Operation received from the States with the approval of the State level Steering Committees headed by the respective Chief Secretaries and within the annual limit of Rs.1,000 crores fixed by the Apex Court. The amounts released to the State CAMPAs in the years 2009-10, 2010-11 and 2011-12 (till now) are indicated in the Annexure. 5% of the funds allocated to the States are also sanctioned for use by the National CAMPA Advisory Council, for monitoring of the Projects being funded out of the CAMPA.

- In relation to monitoring of expenditure incurred from out of the funds sanctioned to the State CAMPAs the following steps are on the anvil:
  - "e-Green Watch" an Integrated CAMPA Concurrent Monitoring and Evaluation System is being established in Pilot phase in five States, namely, Andhra Pradesh, Karnataka, Madhya Pradesh, Sikkim

and Tripura. This work is being spear headed by the Ad-hoc CAMPA with the support of NIC and Forest Survey of India. The fully operations e-green watch will facilitate on-line real-time assessment of activities implemented from CAMPA funds, and will be a monitoring tool;

- A web-based online monitoring system for approval-status of proposals received under FCA is under implementation;
- Audit of utilisation of CAMPA funds is being undertaken through the Accountants General. The C&AG of India have been addressed in this matter.
- The Projects mentioned at (1) and (2) above have been undertaken using CAMPA funds allocated to the National CAMPA Advisory Council.

### **Diversion of Forest land for non forestry uses is in the nature of exception**

The Forest (Conservation) Act, 1980 is an example of the national political will to preserve its precious forest, wildlife and biodiversity wealth. The Act has resulting in drastic reduction in rate of diversion of forest land for non-forest purposes from 1.65 lakh hectares per annum during the 25 years period from 1951-52 to 1975-76 prior to enactment of the Act to approximately 36,300 hectares per annum after the Act came into existence, that too with provisions for appropriate mitigation measures.

### **Strict compliance of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006**

The guidelines issued under the Forest (Conservation) Act, 1980 envisage strict compliance of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The Ministry is

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ensuring that the forest land is diverted only after the rights, if any, under the FRA are settled.

### Good practices adopted to ensure transparency

Good practices have been adopted to ensure transparency in the system of forestry clearances. Monitoring mechanism for grant of the forestry clearances has been strengthened. Agenda and minutes of Forest Advisory Committee Meetings, important Guidelines and modifications are being regularly placed and updated on Ministry's website. The status of all proposals received in the Ministry is also available in the public domain.

The Ministry is also starting a web-based system of Online Monitoring of Forest Clearances. The Online Monitoring of Forest clearances is a work flow based application being developed for monitoring the proposals submitted by User Agencies for seeking forest clearances for diverting forest land for non-forestry purposes. This software application will be used by all State Forest Departments, Regional Offices and headquarter at Ministry of Environment & Forests to feed and update the data pertaining to their level. This software application will contain a database of all forest land diversion proposals submitted to the Ministry.

### Forest Establishment (FE)

The Forest Establishment division is handling the establishment matters in respect of the following organizations:-

- The Indian Council of Forestry Research and Education (ICFRE) an autonomous organization under the Ministry of Environment & Forests, and its Institutes/ Centers namely:-
  - Forest Research Institute, Dehradun
  - Arid Forest Research Institute, Jodhpur
  - Forest Research Centre, Hyderabad

- Forestry Research & Human Resource Development Centre, Chhindwara
- Himalayan Forest Research Institute, Shimla
- Institute of Forest Genetics and Tree Breeding, Coimbatore
- Institute of Forest Productivity, Ranchi
- Institute of Wood Science and Technology, Bangalore
- Rain Forest Research Institute, Jorhat
- Tropical Forest Research Institute, Jabalpur
- Forest Survey of India (FSI), Dehradun and its following four Zonal Offices as indicated below:-
  - Central Zone, Nagpur
  - Eastern Zone, Kolkata
  - Northern Zone, Shimla
  - Southern Zone, Bangalore
- Wildlife Crime Control Bureau (WCCB) and its Regional Offices at :-
  - Chennai, Southern Region
  - Kolkata, Eastern Region
  - Mumbai, Western Region,
  - Jabalpur, Central Region
  - New Delhi, Northern Region
- Directorate of Forest Education (DFE) including the following State Forest Colleges:-
  - State Forest Service College, Dehradun
  - State Forest Service College, Coimbatore
  - State Forest Service College, Burnihat
  - State Forest Service College, Kurseong
- National Zoological Park (NZP), New Delhi
- Indira Gandhi National Forest Academy (IGNFA), Dehradun

Forestry establishment matters relating to all the Union Territories of India (except Andaman & Nicobar Forest Plantation

**Table-13.** Statement showing the number of cases received and number of cases cleared under the Forest (Conservation) Act, 1980 during the year 2010-11 and 2011-12 (upto 31 December 2011)

S. No	Name of the Regional Office	2010-11			2011-12 (upto 31.12.2011)		
		No. of cases received	Approved		No. of cases received	Approved*	
			No. of cases *	Forest area diverted (ha.)		No. of cases*	Forest area diverted (ha)
1.	Bangalore	76	47	212.17	62	27	126.31
2.	Bhopal	180	136	916.15	198	75	283.78
3.	Bhubaneswar	65	71	991.28	43	38	697.63
4.	Lucknow	519	615	2,108.55	386	424	947.01
5.	Shillong	118	118	727.84	90	103	362.82
6.	Chandigarh	870	582	903.45	724	339	327.09
Total		1,828	1,569	5,859.44	1,503	1,006	2,744.63

\* Includes cases received during the preceding years

Development Corporation) and general references in respect of frontline staff of state forest departments.

The court cases, RTI applications and Parliament Matters pertaining to the above.

### Progress/Achievements made during the year

- With a view to having uniformity in the service conditions of forest personnel (ACF and below) in the Union Territories, [Forests being a Concurrent subject under the Constitution, the Centre's role with regard to the States is only advisory in nature], the Cabinet Secretariat has amended the Allocation of Business Rules on 26<sup>th</sup> February, 2012, transferring the subject 'Forests' in respect of all the Union Territories to Ministry of Environment and Forests from Ministry of Home Affairs.

### Strengthening of Forests Division

#### Introduction

The Ministry of Environment & Forests has six Regional Offices located at Bangalore, Bhopal, Bhubaneswar, Lucknow, Shillong and

Chandigarh with its Headquarter Unit in the Ministry at New Delhi. Names of the Heads of the Regional Offices with their address, telephone and fax numbers are given in the Annexure - IIA. Regional Offices monitor and evaluate the ongoing forestry projects and schemes with specific emphasis on conservation of forests, and oversee the implementation of conditions and safeguards laid down by the Ministry while granting clearance to development projects under Forest (Conservation) Act, 1980 (FCA) and Environment (Protection) Act, 1986 (EPA).

#### Progress of Activities undertaken

The Heads of the Regional Offices are empowered to grant approval for diversion of forest land for non-forestry purposes up to the extent of 05 hectare (except mining and regularization of encroachments) and to process cases between 05 hectare and 40 hectare in consultation with the State Advisory Committee and to undertake physical inspection of sites in cases of diversion of forest lands to non-forestry purposes involving an area of more than 100 ha. A statement showing the number of cases received and number of cases cleared by the Regional

Offices under the Forest (Conservation) Act, 1980 during the year 2010-11 and 2011-12 (upto 31 December 2011) is given in Table-13.

### Other Activities undertaken

Some of the important activities undertaken/ meetings held during 2011-12 (upto 31 December, 2011) are as follows:

- A meeting of officers and scientists of the Regional Offices was held on 23-24 June 2012, which was jointly chaired by Shri J.M. Mauskar, Special Secretary and Shri Arun K. Bansal, Additional Director General of Forests (FC). The functioning of the Regional Offices, both Forestry as well as Environmental functions, were reviewed in the meeting. The meeting was also attended by senior officers of the Ministry from Environment and Forestry wings.
- An interactive review meeting was organised at the Regional Office, Bhubaneswar with the Coal India Subsidiary Companies, under the Chairmanship of the Additional Director General of Forests (FC), Ministry of Environment and Forests to facilitate clearance of Coal Mining projects for the States of Eastern & Western regions (Odisha, Jharkhand, Chhatisgarh, Madhya Pradesh and Maharashtra).
- With continuous persuasion of the Regional Office, Bhubaneswar, the Orissa State Forest Department have taken initiative for assessment of Non-Timber Forest Produce (NTFP) reserves for which a 2-day's workshop on NTFP resource assessment was organised in November, 2011. Division level assessment of NTFP resources is to follow.
- The Regional Office, Bhubaneswar has specially focused on conducting primary field study of flora and fauna including amphibians and pollinators for the fresh mining proposals, stressing upon the importance of the study in the target virgin areas and its vicinity to prepare a baseline data for the impact study in future. Embarking upon the endeavour of the ERO, the Bhushan Steel Ltd. has submitted the study to ERO for their prospecting/mining proposal and OPGC, NTPC, Essel mining have also initiated studies in this regard.
- The Regional Office, Bhubaneswar has also added to its priority to focus on restoration of post mining land use so that the productivity of land after post mining restoration is enhanced or at least equal to the pre mining land use which is reflected in the recent diversion proposals submitted by NTPC, Coal India Ltd., SAIL, JSPL, JSW, OPGC etc.
- The Regional Office, Bhubaneswar has also initiated a practice of inviting experts from Mining, Hydel sectors to the State Advisory Group (SAG) meetings to enhance the level of analysis and appreciation of the technical parameters during the discussion of the proposals.
- The Regional Office, Bhubaneswar's persistent pursuance has augmented the notifications of compensatory afforestation land further, which now stands 81 in Odisha, 15 in Jharkhand, one in West Bengal and two in A & N Islands.
- The Regional Office, Bhubaneswar has also reiterated its efforts to emphasize utilization of iron ore up to 45%, insisting R & D for utilization of shale in coal and preference to rail evacuation instead of road transport.
- The Regional Office, Bhubaneswar has identified important sectors such as Aluminium & Bauxite sectors, Thermal Power Projects, Oil, Gas & Petroleum sector, Steel & Sponge Iron sector and Nodal Scientists have been nominated for each sector to develop expertise in different categories of the projects that

have been accorded environmental clearance by the Ministry. The concerned scientists are being encouraged to specialise in each of the allotted sectors.

- One interactive meeting on environmental issues pertaining to Cement Industry was organised at Bhubaneswar on 13 May 2011. Following road map was drawn during the interactive meeting to facilitate closer interaction between industries and institution: a) To establish R&D Funds under the control of R&D Fund Executive Committee, b) To establish a think-tank by drawing 4-5 experts from the industries for technical guidance and for setting up long-term and short-term targets and c) Setting up of a centre from consortium funds for R&D in one the campuses of leading institutes like IITs, NITs, etc. A follow-up action on the outcome of the interactive meetings held earlier is being continued in a) Aluminium & Bauxite sector, b) Thermal Power Projects and c) Oil, Gas & Petroleum Projects, d) Iron & Steel Sector, e) Coastal Harbour Projects and f) Cement Sector to ensure implementation of environmental safeguard measures including R & D support to industries for environmental management as recommended. The details are:
  - The industries conducted follow up meetings and the thrust areas were identified viz., Water Audit and its Management, Energy Audit, Solid Waste Management, Introduction of Transplantation Methods in Afforestation, Beneficiation of Low Grade Minerals and Carbon Reduction Measures. An agreement has already been signed between M/s. Bramhani River Pellets Limited, Iron Ore mines of M/s Jindal Steel & Power Limited (JSPL) and NIT, Rourkela to take up Water Audit and Management (an initiation for

the region as a result of persuasion by the Regional Office). M/s. Jindal Steel Power Limited have also given a pilot project to IIMT, Bhubaneswar for utilisation of low grade iron ore (up to 45%). Eastern Zone Mining Association has in principle approved a project, "Web Enabled ESP/ETP Monitoring System to Control Air Pollution" to NIT, Durgapur. Interactive meet has also helped to focus on R&D activities, raising of funds for all the R & D activities and development of scientific and human resources data base in the sector.

- Of various issues identified during meetings, Institute of Minerals and Materials Technology (CSIR) and M/s Vedanta Aluminium Limited have jointly taken up pilot projects. NIT, Rourkela and M/s Vedanta Aluminium Limited have entered into a MOU for a joint R & D project, "Pilot Plant Study of iron extraction from red mud" which will be a significant step in waste reduction and Red Mud Utilisation. M/s Aditya Aluminium is also pursuing with institutes to initiate projects on (i) Enrichment of Fe in red mud close to 60%, increasing the stable angle of repose of dry red mud, developing a land fill lining material using red mud and other wastes and reactive silica stabilization in Bauxite to reduce caustic consumption. Successful R & D outcomes on above problems will help reducing pollution load significantly in Aluminium industries.
- Measures have been initiated by projects for harvesting rain water and energy conservation by reducing Auxiliary Power Consumption in power plants. The

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- benefits of mist cooling system discussed during the interactive meetings that helps in reduction in Auxiliary Power Consumption is implemented by M/s Vedanta Aluminium Ltd in its new Power Plant.
- Regional Office, Bangalore has submitted a comprehensive report on the major public sector undertakings and other polluting industries in Visakhapatnam area and suggested measures for containing pollution in 1) NTPC - Simhadri Thermal Power Project, 2) Visakhapatnam Steel Plant, 3) Hindustan Petroleum Corporation Limited (HPCL), 4) Visakhapatnam Port Trust, 5) Hindustan Shipyard - Visakhapatnam, 6) Coromandel Fertilizers Ltd.
  - Two students of Indian Institute of Management, Bhopal did internship in Regional Office, Bhopal on the subject "Monitoring and evaluation of forest area diversion", "Status of compliance and impact of Forest, Wildlife and Social Impact".
  - A small garden dedicated to indigenous fragrant plants has been developed in the office complex of the Regional Office Bhubaneswar. 35 species of fragrant plants have been added since last year and the total at present is 70 species of fragrant plants. An initiative has been taken by the Regional Office, Bhubaneswar to recognise this rare garden for entry into the Limca Book of Records. A reply from M/s Limca Book of Records has been received stating that they would like to consider the fragrant garden in an office-cum-residential complex in 2013 edition. Efforts are being made to increase the number of fragrant plant species.
  - The Regional Office, Bangalore has made thorough study of mining situation in Goa and forwarded reports on discrepancies in permission issued under Wild Life Act, excess production, Environmental Protection measures taken by mining companies and recommended closure of several mines.
  - The Chief Conservator of Forests (Central), Regional Office, Bangalore assisted the Committee constituted by the Hon'ble Supreme Court of India to carry out demarcation of the mining leases in Bellary Forest Division.
  - Regional Office, Shillong successfully co-ordinated the meeting of Secretary, Ministry of Environment and Forests with the Chief Secretaries of the North-Eastern States, including Sikkim, on 30 June 2011 at Guwahati to review Plan Schemes of the Ministry.
  - Regional Office, Shillong has organized meeting of the Nodal Officers of the N. E. States including Sikkim during 15-16 September 2011 to discuss the prioritization of forest clearance proposals and to take effective steps to avoid delays in preparation and processing of forest clearance cases and for early declaration of Compensatory Afforestation land into Protected/ Reserved Forests.
  - The World Environment Day, 2011 was organised in the Regional Office, Shillong by planting over 300 flowering and fruit bearing saplings by the residents of the residential complex to enhance the greenery of the campus.
  - On the orders of the Ministry of Environment & Forests, the scientists of Regional Offices have developed protocol and format for self monitoring for adoption by all the project proponents; and developed the criteria and formulation of guidelines for categorization of non-compliances into the category of serious and not so serious.

**Table-14.** Financial Targets and Achievements for the year 2011-12 (Rs. in crore)

Revenue head		Capital head	
BE 2011-12	Expenditure (upto 31.12.2011)	BE 2011-12	Expenditure (upto 31.12.2011)
10.50	7.79	0.50	0.23

### Financial Achievement

A statement showing financial targets and achievements for the year 2011-12 is given in Table-14.

## Intensification of Forest Management Scheme (IFMS)

### Introduction

While aiming to expand forest cover in the country, it is equally important to improve the state of existing forests and protect them against various threats. This Centrally Sponsored 'Intensification of Forest Management Scheme' (IFMS) aims at strengthening forest protection machinery of the State/UT Governments and providing support for area-specific forest management interventions. The financial assistance is provided on cost share basis - All the North Eastern States including Sikkim and special categories States, namely, Jammu & Kashmir, Himachal Pradesh and Uttarakhand share 10% of the cost while the rest of the States/UTs share 25% of the cost of the annual plans of operations.

The major components of the scheme include:

- Forest fire control and management.
- Strengthening of Infrastructure.
- Survey, Demarcation and Working Plan preparation.
- Protection and Conservation of Sacred Groves.
- Conservation and Restoration of Unique Vegetation & Ecosystems.
- Control and Eradication of Forest Invasive Species.

- Preparedness for Meeting Challenges of Bamboo Flowering and Improving Management of Bamboo Forests.

While the first three components have been under implementation since the X Plan period under the erstwhile 'Integrated Forest Protection Scheme', the remaining four components have been introduced from the year 2009-10 after obtaining the Cabinet approval.

### Outcome

The scheme has helped the State/UT forest departments in modernizing the forestry sector by way of creating infrastructure such as field offices, forest stations, residential facilities for frontline staff; construction of roads and patrolling paths; introduction of modern technology including use of PDA for field surveillance and reporting; providing field vehicles, arms and ammunitions.

Introduction of advanced technology helped in bridging the backlog in preparation of working plans. Forest fire control has become progressively effective by way of creation and maintenance of firelines for prevention of forest fires, early detection, reporting and quick mobilization of force for forest fire control. Modern technology has also helped in improving planning for forest fire control and management.

This scheme has also provided incentives for involvement of local people through Joint Forest Management Committees in forest protection. Presently, there are 2,74,134 JFMCs managing 6,71,42,757 mha involving 38,62,811 people of forest area.

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**Table-15.** Expenditure incurred in the last five years

	Year				
	2007-08	2008-09	2009-10	2010-11	2011-12 (upto 05.03.2012)
Expenditure Rs lakhs	6698.5047	7461.3964	6933.72	5685.35	5620.19

### Fund Managing

The XI plan outlay for the scheme is Rs.600.00 crores. The allocation for the year 2011-12 is Rs.65.00 crores. Expenditure incurred in the last five years is given in Table-15.

### Major Achievements

Major achievements in the financial year 2010-11 in the scheme are as follows:

- 1,00,821 mandays of work was created for people living on forest fringes.
- 96,916 Km of firelines were constructed/maintained for fire control.
- 27,185 boundary pillars were constructed to demarcate forest areas.
- 302 buildings for infrastructure support to frontline staff were constructed.
- 13 vehicles were provided to states for improving communication and rapid mobility.

### Forest Policy

Forest Policy Division of Ministry of Environment & Forests (MoEF) coordinates the National Forest Policy, 1988 and its implementation issues, Indian Forest Act, 1927 and Policy and legislative issues of other Central Ministries/ Departments related to Forests and Scheduled Tribes & coordinating the State Forest Policies, State Forest Acts/Amendment etc. Forest Policy Division coordinates with Ministry of Panchayati Raj, Ministry of Tribal Affairs and Planning Commission on the matters related to various Acts and Policies.

In addition Forest Policy Division has been the nodal division regarding Forestry in relation to Climate Change and REDD+ Cell in Forestry Wing of MoEF. It works on various policy issues on forestry and linkages with forestry sector. It co-ordinates the various forestry divisions in the Ministry and conducts meetings of the committees constituted by the Ministry. Besides these activities, Forest Policy Division acts as a National Focal point on the Forestry International Cooperation which has been mentioned here in detail:

### Forest International Cooperation (FIC)

FIC Division coordinates on the matter related to forestry of International cooperation with Committee on Forestry (COFO) of Food and Agriculture Organization (FAO), Asia Pacific Forestry Commission (APFC) and United Nation Forum on Forests (UNFF) and also coordinates on the bilateral co-operation between India-China on forestry matter. During the year 2011-12 some of the important International cooperation/visits which have been made on the forestry matters are as follows:

- (i) Visit to attend the 24th Session of Asia Pacific Forestry Commission:

Three member Indian delegation headed by Shri A.K. Bansal, Additional Director General of Forests with other members namely Shri R. K. Goel, Inspector General of Forests, EAP and Shri Subhash Chandra, Dy. Inspector General of Forests, Forest Policy attended the 24th Session of Asia Pacific Forestry Commission from 07-11, 2011 at Beijing, China.

The delegation also participated in the week long Event from 7th to 11th November, 2011. In the Commission India brought out the fact that India capacity to impart training to the officials from Countries of the Asia Pacific Region with specific reference to the following:-

- State of Forestry in the Asia Pacific Region
  - The Impact of REDD+ and forest sector governance and land management in Asia Pacific
  - FLEG-T: Continuous improvement in forest governance
  - Progress in implementing APFC and FAO-supported activities
  - "New Media - New Messages: Forestry communications in Asia and the Pacific"
  - "Journey to 2020: The future for forestry in Asia and the Pacific
  - Heads of Forestry dialogue: Defining forestry's role in the emerging "Green Economy"
  - Climate change adaptation and ecosystem resilience
  - Significance of forests in relation to climate change: Mission for a Green India (GIM) Initiative:
  - Responding to increased demands in fire management
  - Regional issues identified by the Commission for the attention of the Committee on Forestry (COFO)
- (ii) Visit of a delegation from Chinese Academy of Forestry to ICFRE from 11-19 December 2011 as a follow up of decision taken for evolving cooperation mechanism on forestry research among BRICS. ICFRE has signed a MoU with Chinese Academy of Forestry for cooperation under the framework of the countries, sharing of research finding, academic programme, etc.
- (iii) A delegation headed by Director, RFRI attended the Ministerial Seminar on

strengthening Cooperation of Forestry (Bamboo) among China and Other Developing Countries from October 26 to November 1, 2011 in Beijing and Hangzhou, P.R. China.

- (iv) Besides the International cooperation, FIC Division has provided inputs on forestry matters to IC Division on Rio+20 Zero draft of the outcome document, meeting with BASIC Ministers, Sustainable Development Goals (SDGs), etc.
- (v) FIC Division has come out with the paper on "Forests for People" for publication in UNFFS Publication for Forests 2011. The Book has been published by the UNFF Secretariat.
- (vi) A team of Chinese delegation from State Forestry Administration, P. R. China led by Administrator, SFA shall visit India to attend the third India-China Joint Working Group meeting to be held during 19-22 February, 2012.

The details of major activities coordinated by the Forest Policy Division during current year are as follows:

#### Activities undertaken so far

- (i) The Ministry has been proactively involved in coordinating the implementation of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 with the Ministry of Tribal Affairs.
- (ii) Forest Policy Division has coordinated and furnished the comments on various matters especially on the "the Land Acquisition and Rehabilitation and Resettlement Bill, 2011 which ensures and highlights the facilities linked to creation of environmental and green infrastructure which is critical for healthy environment and humane living like landfill sites, water treatment plants, effluent treatment plants, parks, gardens, green belts, creation of National Parks

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and Wildlife Sanctuaries, critical wildlife corridors, conservation reserves etc. and should include requirements for implementation under the Wildlife (Protection) Act, 1972, the Environment (Protection) Act, 1986, the Biological Diversity Act, 2002. The Ministry of Environment and Forests also clears that the land under the titles distributed under the Forest rights Act, 2006 still remains Forest land

under the ownership of the Government, therefore, the forest right holders should not be treated as land owners but as a holder of forest right which is inheritable but inalienable and non transferable.

- (iii) The National Forest Policy 1988 envisages that one-third of the total land area of the country should be under forest or tree cover. To achieve this objective, forestry activity on forest private land has to be promoted. Keeping in view, a Committee to study the regulatory regime regarding felling and transit regulations for tree species grown on non-forest/ private lands has been constituted in Forest Policy Division under the Chairmanship of Addl. Director General of Forests (FC) on 20<sup>th</sup> July, 2011 with following Terms of Reference:

- To study the current regulatory regimes of different States/UTs regarding felling and transit for trees grown on private lands.
- To evaluate at the experience of different States/UTs.
- To recommended the regulatory regime in Mission to Green India.
- To review the Lok Vaniki Act of Madhya Pradesh.



Fig-29. A view of forests at Mouling National Park

- (iv) The Division has firmed up the matters related to Private-Public Partnership in reforestation of degraded lands. The comments of MoEF have been sent to Department of Economic Affairs in which the Ministry is of view that there is a need for large scale promotion of agro-forestry plantations integrated with wood based industries. Substantial improvement is required in productivity of agro forestry plantations based on genetically improved planting stock and improved package of practices, by encouraging R&D on a massive scale by substantially reduction in income tax, custom duty on scientific equipments, etc. and other benefits to promote infrastructure in R&D. Promotion of agro-forestry incidentally will provide higher income to farmers, create employment opportunities and reduce pressure on natural forests which, in turn, can provide improved environmental services.
- (v) A memorandum of Agreement has been signed between the Government of India, Government of West Bengal and Gorkha Janmukti Morcha (GJM) on 18<sup>th</sup> July, 2011 for establishing an autonomous self-governing body called Gorkhaland Territorial Administration (GTA). MoEF

has provided the comments to Govt. of West Bengal and Ministry of Home Affairs on the Gorkhaland Territorial Administration Bill, 2011 of West Bengal as passed by Assembly of West Bengal on 2<sup>nd</sup> September, 2011.

- (vi) India has taken a firm stance in favour of a comprehensive REDD+ approach and playing a positive role through Green India Mission (GIM) programme under NAPCC. Some of the basic activities to be taken under REDD+ are:
- Reducing emission from deforestation
  - Reducing emission from forest degradation
  - Conservation of forest carbon stocks
  - Sustainable management of forest
  - Enhancement of forest carbon stocks, etc.

In the Indian context carbon service from forest and plantation is one of the co-benefits. The country would also like safeguards for ensuring the full participation of local communities and other stakeholders.

- (vii) Forest Policy Division has processed the matter of "the Land Titling Bill 2010" and furnished the comments on "the Land Titling Bill 2010" to Department of Land Resources, Ministry of Rural Development on 18<sup>th</sup> July, 2011 wherein the Ministry signifies that the land notified or in the process of notification as reserved forest, protected forest, etc. and lands covered under 'definition of forests' in Supreme Court orders in T.N. Godavaraman case will be specifically excluded from the purview of the act.
- (viii) Forest Policy Division in the Ministry is a nodal Division for persuing the matters related to Recommendations of the Committee on State Agrarian Relations and the Unfinished Task in Land Reforms being coordinated by DoLR, Ministry of Rural Development (MoRD). The FP

Division has furnished the comments on the matters to DoLR.

- (ix) A Working Group on Forestry and Sustainable Natural Resource Management for the 12<sup>th</sup> Five Year Plan was constituted by The Planning Commission on 17<sup>th</sup> June, 2011. The Working Group comprised of Sub-Groups on a specific themes. The preparation of the Report related to one of the Sub-Groups i.e. on Sub-Group V "International Cooperation and Law" was assigned to Forest Policy Division has submitted the final report of the Sub-Group V on International Cooperation and Law to the Planning Commission.
- (x) Amendment of Section 68 of Indian Forest Act, 1927: Under the present provision of IFA, 1927 where the power to compound forest offences is extremely limited, even petty cases are often referred to courts for prosecution leading to harassment of Tribals and Other people living in proximity of forests, who may sometimes unknowingly commit a petty forest violation. Hence to ensure that in instances of such petty forest violation, the local people are not put to undue harassment through prosecution which entails litigation in courts, it is proposed to amend Section 68 (3) of Indian Forest Act, 1927 to enhance power vested with forest officials to compound a forest offence up to a limit of Rs. 10,000 (Rupees Ten Thousand only). The Amendment Bill, 2010 is to be introduced in the Rajya Sabha.
- (xi) The issue of linking JFM Committees with Panchayats has been resolved by issuing an advisory to State Governments under which JFMCs are to be treated as organs of Gram Sabha and they shall work under the overall guidance and supervision of Gram Sabha. The main points of the Advisory are as follows:

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- Existing JFMCs should function under the overall guidance and supervision of the Gram Sabha and where new JFMCs are to be set up they should be done the Gram Sabhas.
- JFMCs should be recognized as organs of the Gram Sabha under the relevant state Acts relating to Panchayat Raj institutions.
- JFMCs should function as Standing Committees of Gram Sabha Panchayats for item 6 (Social Forestry and Farm Forestry) and item 7 (Minor Forest Products) listed in the Eleventh Schedule to the Constitution.
- The manner in which the development funds of the JFMCs are used should be approved by the Gram Sabha.

(xii) Forest Policy Division has organized the celebration of World Forestry Day 2011 at National Zoological Park, New Delhi on 21<sup>st</sup> March, 2011.

(xiii) Forest Policy Division is the nodal Division for coordinating the Project "Sustainable Landscape and Climate Adaptation Programme" signed between the Government of India and USAID.

## Wildlife Conservation Introduction

Government of India provides technical and financial support to the State/ UT Governments for wildlife conservation under the various Centrally Sponsored Schemes - *Integrated Development of Wildlife Habitats*, *Project Tiger*, and *Project Elephant*, and also through Central Sector Scheme - *Strengthening of Wildlife Division and*

*Consultancies for Special Tasks*, and through Grants in Aid to the Central Zoo Authority and Wildlife Institute of India, Dehradun. The objectives and details of the Schemes handled by the Wildlife Division are as given below:

## CSS-Integrated Development of Wildlife Habitats

At present India has a network of 668 Protected Areas (102 National Parks, 515 Wildlife Sanctuaries, 47 Conservation Reserves and 4 Community Reserves). State-wise list of Protected Area is at Table-16.

The Government of India provides financial and technical assistance to the State/UT Governments for activities aimed at wildlife conservation through the Centrally Sponsored Scheme viz. 'Integrated Development of Wildlife Habitats'. The scheme has following three components:

- Support to Protected Areas (PA) (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)
- Protection of Wildlife Outside Protected Areas
- Recovery programmes for saving critically endangered species and habitats.



Fig-30. *Cryptelytrops erythrus*, known as Spot-tailed Pit Viper



Fig-31. Deepar Beel Bird Sanctuary, the only Ramsar site of Assam

### Support to Protected Areas

- **Eligible PAs:** National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves, other than those availing central assistance under the CSS- Project Tiger, which are duly notified under the Wildlife (Protection) Act, 1972 and are under the control of the Chief Wildlife Wardens.
- **Pattern of funding:** 100% central assistance is provided for non-recurring items and 50% assistance for recurring items. Areas falling in mountain regions, coastal zones, deserts, or those areas which support certain selected endangered species, are eligible for 100% central assistance for both recurring and non-recurring items.

### Protection of Wildlife Outside Protected Areas

There is substantial wildlife and natural resources lying outside the Protected Areas network of India. This component seeks to support the conservation of wildlife in these areas.

- **Eligible areas:** High value biodiversity areas outside PAs. Areas contiguous to

PAs/corridors are given priority. The Chief Wildlife Wardens prepare a Biodiversity Conservation Plan for such selected area.

- **Pattern of funding:** Same as in the case of PAs.

### Recovery programme for critically endangered species and habitats

This component is for affecting the recovery of critically endangered species in the country. Initially 15 species have been identified under this component. These are Snow Leopard, Bustard (including Floricans), Dolphin,

Hangul, Nilgiri Tahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion and Swamp Deer.

The Director, Wildlife Preservation, Government of India, in consultation with the Wildlife Institute of India or the relevant scientific institute and with the approval of the Standing Committee of the NBWL can initiate other recovery programmes or wind up an ongoing programme.

**Pattern of funding:** 100% assistance is provided for both non-recurring and recurring items. Each recovery programme has to be based on a comprehensive and scientific 'Recovery Plan'. The Chief Wildlife Wardens of the concerned States (if the species range is in more than one State), shall jointly prepare the Recovery Plan with the help of a national scientific institute/ organization of repute.

### Activities under CSS- 'Integrated Development of Wildlife Habitats'

Activities covered under the Centrally Sponsored Scheme 'Integrated Development of Wildlife Habitats' are as follows:

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- **Management Planning and capacity building**

- Strengthening wildlife research, education and nature awareness
- Staff development and capacity building
- Monitoring and evaluation
- Management Planning

- **Anti-poaching & infrastructure development**

- Anti-poaching activities
- Strengthening of infrastructure
- Strengthening Wildlife veterinary care
- Strengthening Staff welfare activities

- **Restoration of habitats**

- Habitat improvement activities
- Safeguards / Retrofitting measures

- **Eco-development and community oriented activities**

- Addressing man-animal conflict
- Strengthening co-existence agenda
- Deciding inviolate spaces and relocation of villages from crucial wildlife habitats
- Fostering ecotourism
- Assistance to activities in Trans-boundary Protected Areas

During the financial year 2011-12, an amount of Rs. 70.00 crores has been allocated under the CSS- 'Integrated Development of Wildlife Habitats' out of which Rs. 7.50 crores has been earmarked for the North Eastern States.

**CSS- Project Elephant**

Project Elephant (PE) was launched by the Government of India in the year 1991-92 as a Centrally Sponsored Scheme with the following objectives :

- To protect elephants, their habitat & corridors
- to address issues of man-animal conflict

- welfare of domesticated elephants

Financial and technical support is being provided to major elephant bearing States in the country. Under the scheme, 100% financial assistance is provided to the concerned State Government for undertaking various activities for scientific management of elephant habitats.

**Presently** The Project is being implemented in 18 States/UTs, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Meghalaya, Nagaland, Odisha, Tamil Nadu, Tripura, Uttarakhand , Uttar Pradesh, West Bengal and Haryana (where an elephant rescue centre has been set up supported by Project Elephant). There are 27 notified and five proposed Elephant Reserves in the country, which are still to be notified by the concerned State Governments, covering approximately 60,000 sq. km. area.

Main activities under the Project are as follows:

- Ecological restoration of existing natural habitats and migratory routes of elephants;
- Development of scientific and planned management for conservation of elephant habitats and viable population of Wild Asiatic elephants in India;
- Promotion of measures for mitigation of man elephant conflict in crucial habitats and moderating pressures of human and domestic stock activities in crucial elephant habitats;
- Strengthening of measures for protection of Wild elephants from poachers and unnatural causes of death;
- Research on Elephant management related issues;
- Public education and awareness programmes;
- Eco-development
- Veterinary care

Due to the effective implementation of the project, especially with respect to the protection of elephants, the elephant

population in the country has risen over the years, even as their habitat has been fragmented due to developmental activity.

During the financial year, India hosted a Ministerial Meeting of eight major elephant range countries in the world and a resolution was adopted during the meeting. In accordance with the resolution, India required to host the Elephant :50 Ministerial meeting of fifty elephant range country in New Delhi during early 2013.

### CS - Strengthening of Wildlife Division and Consultancies for Special Tasks

This Central Sector Scheme was launched in 1986 to strengthen the Wildlife Division in the Ministry and the Regional Offices of Wildlife Preservation for fulfilling the statutory obligations under the Wildlife (Protection) Act, 1972 and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

International trade in wild flora and fauna is regulated by the provisions of the EXIM Policy, the Wildlife (Protection) Act, 1972 and CITES convention. The Director (Wildlife Preservation) is designated as the CITES Management Authority and the Regional Deputy Directors (Wildlife Preservation) are the Assistant Management

Authorities under CITES. They monitor and regulate international trade in wildlife and its derivatives at the designated ports of exit and entry.

The Scheme "Strengthening of Wildlife Division and Consultancies for Special Tasks" provided assistance to the Regional Offices located in Delhi, Mumbai, Kolkata, Jabalpur and Chennai for manpower and development of infrastructure. Assistance was also extended to the three sub-regional offices at Guwahati, Amritsar and Cochin. In addition, the Scheme also supported the functioning of the Wildlife Division in the Ministry. The allocation of the Scheme during the year 2011-12 is Rs 6.00 Crores of which Rs. 3.58 crores has been utilized till date.

The Scheme also supported wildlife research activities/projects envisaged in the National Wildlife Action Plan (2002-2016). Grant were also provided to research institutes, universities, NGOs and other organizations of repute engaged in wildlife research both at the field and laboratory levels. Major areas supported inter alia include taxonomy, population estimation, wildlife conservation & management, restoration of degraded ecosystems, etc. During 2011-12, eight research proposals on Wildlife Conservation have been approved.

### National Board for Wildlife

The National Board for Wildlife (NBWL) has been constituted as per the provisions of the Wild Life (Protection) Act, 1972 in 2003. The Board is Chaired by the Hon'ble Prime Minister and has 47 members including Members of Parliament, Chief of the Army Staff, Member, Planning Commission, representatives of Non Government



Fig-32. Assam roofed turtle (*Phangsuras sylhetensis*) at Kaziranga National Park



Fig-33. Bird at Keshopur Wetland

Organizations, eminent environmentalists/conservationists/ecologists and other official members. The NBWL is reconstituted every three years. The NBWL was last re-constituted vide notification dated 4<sup>th</sup> September 2010. Till date five meetings of the Board have been convened since its constitution.

#### Standing Committee of NBWL

The NBWL has also a Standing Committee that is Chaired by the Minister-in-charge of the Ministry of Environment and Forests. The Standing Committee of NBWL was first constituted on 4th November 2003 for a period of three years. It was last reconstituted on 14th September 2010. Till date the Standing Committee of NBWL has met 24 times since it was first constituted in November 2003. The Standing Committee of NBWL considers issues relating to conservation and protection of wildlife and their habitat. It also considers proposals involving non-forestry activities in wildlife habitats.

#### Red Listing Process in India

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species is the world's most comprehensive inventory of the global conservation status of plant and animal species.

In India, many organizations have been working independently on the red listing process focusing on specific areas of interest as islands of excellence. It was felt that the Ministry of Environment and Forests should provide necessary coordinating mechanism to integrate the efforts of scientific and voluntary organizations resulting into a scientifically acceptable useful output. It was also felt that the process of red listing of species for the country should follow the framework of IUCN Regional Guidelines and criteria.

A consultative workshop was jointly organized by the Ministry of Environment and Forests and the IUCN -India on 1<sup>st</sup> February 2011. As a follow up to this, the Ministry of Environment and Forests constituted the Steering Committee (SC) in February 2011 under the Chairmanship of the Addl. Director General of Forests (WL).

The Steering Committee had decided for taking up the exercise on a specific time schedule basis so as to come up with the first report before the CBD-COP-11 to be held in October 2012 in Hyderabad.



Fig-34. Artificial nest at Ropar Wetlands

## International Conventions Related to Wildlife

### Convention on International Trade in Endangered Species Of Wild Fauna & Flora (CITES)

- Signed in March 1973 to regulate international trade in endangered species of wildlife.
- The convention has 25 Articles from definitions to the manner in which the trade in species included in various Appendices of the convention could be regulated.
- India signed the Convention in July 1976 which was ratified in October 1976.
- All import, export, re-export and introduction from the sea of species covered by the Convention has to be authorized through a licensing system.
- The species covered by CITES are listed in three Appendices according to the degree of protection they need.
- The Director, Wildlife Preservation has been designated as the CITES Management Authority for India.
- The enforcement of the convention and the provisions of CITES is carried out by the Regional Deputy Directors, Wildlife Preservation, who have been designated as the Assistant CITES Management Authority for India.
- India had represented in the meeting of the Animals Committee, Plants Committee and Standing Committee of CITES.
- India has initiated a Non Detrimental Finding (NDF) study of the Red Sanders (*Pterocarpus santalinus*)

### Convention on Migratory Species (CMS)

- Also known as the 'Bonn Convention' , it is an inter-governmental treaty, concluded under the aegis of the United

Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale.

- The Convention came into force in 1979.
- The Convention aims to conserve migratory species throughout their range.
- India is a Party to the convention since 01st November, 1983
- India had participated in the 10th Conference of Parties to the CMS held in Norway in November 2011.

### Agreements under CMS to which India is a signatory

#### - Siberian Crane MOU

- The MOU aims at better conservation and protection of the Siberian Cranes and their habitat
- India had signed the MOU on 13<sup>th</sup> December 1998.
- Siberian Cranes are migratory visitors to India in winter.
- The species is included in the Schedule-I of the Wildlife (Protection) Act, 1972 thereby according them full protection.
- Their wintering habitats have been declared Protected Areas.

#### - Marine Turtle MOU

- The MOU aims at better conservation and management of Marine Turtles and their habitats in the South East Asian Region.
- India had signed the MOU on 20<sup>th</sup> February 2007.
- Marine Turtles are migratory visitors to India, especially along the East Coast of India.
- Five species of Marine Turtles (including Olive Ridley Turtles) are included in the Schedule-I of the Wildlife (Protection) Act, 1972 thereby according them full protection.

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Fig-35. Sarus Crane (*Grus antigone*) with Great Egret (*Egretta alba*)

- Their nesting habitats have been declared Protected Areas.

#### - **Dugong MOU**

- The MOU aims at better conservation and management of Dugongs (*Dugong dugon*) and their habitats through out their Range.
- India had signed the MOU on 28<sup>th</sup> May 2008.
- Dugongs are found in the Indian waters, from Gujarat to Andaman & Nicobar Islands.
- Dugongs are included in the Schedule-I of the Wildlife (Protection) Act, 1972 thereby according them full protection.
- Their important habitats have been declared Protected Areas.
- India had organized an International Workshop on Conservation of Dugongs during June 2011 in Tuticorin, Tamil Nadu.

#### **UNESCO-World Heritage Convention (WHC)**

- Aiming to list and conserve the world's heritage sites (Cultural, Natural & Mixed)
- The Convention was adopted by the

United Nations Educational, Scientific & Cultural Organization (UNESCO) in 1972. India had signed the Convention on 14<sup>th</sup> November, 1977.

- Identification, nomination & management of Natural Heritage Sites are being handled by Ministry of Environment & Forests.

- Sites of outstanding value to humanity that are to be protected and preserved for posterity are considered as World Heritage Sites.

- "natural heritage" consist of natural features consisting of physical and biological formations or groups of such formations,

which are of outstanding universal value from aesthetic or scientific point of view; geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from point of view of science or conservation; and/ or natural sites.

- Five natural sites declared as World Heritage Sites. In addition, Valley of Flowers was included in the World Heritage list as an extension to the Nanda Devi National Park. The list of such sites are as given below:

#### **Natural World Heritage Sites in India**

- Kaziranga National Park (1985)
- Keoladeo National Park (1985)
- Manas Wildlife Sanctuary (1985)
- Nanda Devi National Park (1988) & Valley of Flowers in 2005 as an extension of Nanda Devi.
- Sundarbans National Park (1987)

The Manas Wildlife Sanctuary was inscribed on the World Heritage List in 1985 and was put on the "List of World Heritage

**Table-16.** 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	Chhattisgarh	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	Orissa	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 Haweli	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
	<b>TOTAL</b>	<b>102</b>	<b>515</b>	<b>47</b>	<b>4</b>

Sites in Danger" on account of the social problems in the area, in 1992. An improving political situation in the 2000s and the signing of the Autonomous Bodoland Territorial

Council under the Bodo Accord (2003) brought back normalcy to the region, and began the process of local communities' involvement in pro-conservation activities.

Since then, concerted efforts from the local people, State Government and Central Government, has lead to the World Heritage Committee to take a decision to remove the site from the 'List of danger'. Incidentally, this is the only heritage site in danger list, out of 16 natural sites in danger list in the world, that has been decided by the UNESCO World Heritage Committee to be taken off the Danger List. This way, India's prestige in the world conservation history has been substantially enhanced. The international community has also appreciated the concerted efforts of India and has noted that other countries managing World Heritage Sites in Danger list could learn a good lesson from the Indian experience to enhance the protection and management of their sites.

#### International Whaling Commission (IWC)

- Set up under the International Convention for the Regulation of Whaling.
- India is a Party to the IWC since 9<sup>th</sup> March, 1981
- The main duty of the IWC is to keep under review and revise as necessary the measures laid down in the Schedule to the Convention which govern the conduct of whaling throughout the world
- India has played a pro-active and prominent role in bringing about a moratorium on commercial whaling and has played a prominent role in supporting the Commission in its efforts towards conservation of such species.
- All the Cetacean species (Whales, dolphins etc) have been included in Schedule I of the Wildlife (Protection) Act, 1972 thereby giving them the highest degree of protection.

#### CS - Wildlife Institute of India, Dehradun

Wildlife Institute of India (WII) was established in 1982 under the Ministry of Environment & Forests. Subsequently it was

granted autonomous status by Govt. of India in 1986. The Institute has emerged as a premier training and research institution in the field of wildlife and protected area management in South and South East Asia. Its mandate is to generate quality information and knowledge

**Table-17.** State-wise release of fund under CSS- 'Integrated Development of Wildlife Habitats' 2010-11(31.12.2011)

(Rs. in lakhs)

S. No.	Name of States/UTs.	Amt. Released
1	Andaman & Nicobar Island	127.06
2.	Andhra Pradesh	71.50
3.	Bihar	00
4.	Chandigarh	19.98
5.	Chhattisgarh	190.64
6	Dadar Nagar Haveli	00
7.	Daman & Diu	00
8.	Goa	00
9.	Gujarat	1126.59
10.	Haryana	23.50
11.	Himachal Pradesh.	242.1104
12.	Jammu & Kashmir	355.465
13.	Jharkhand	46.7475
14.	Karnataka	212.87
15.	Kerala	573.18
16.	Madhya Pradesh	405.739
17.	Maharashtra	298.743
18.	Orissa	218.3929
19.	Rajasthan	249.143
20.	Tamil Nadu	227.01
21.	Uttar Pradesh	187.291
22.	Uttarakhand	201.144
23.	West Bengal	112.15
24.	Punjab	00
<b>Total</b>		<b>4889.2558</b>
<b>North-Eastern States</b>		
26	Arunachal Pradesh	168.11
27	Assam	234.17
28	Manipur	86.65
29	Meghalaya	35.039
30.	Mizoram	83.80
31	Nagaland	23.043
32	Sikkim	131.793
33	Tripura	00
<b>Total</b>		<b>762.605</b>
<b>Grand Total</b>		<b>5651.8608</b>

products in wildlife science and mainstream it in capacity building programmes for various target groups and provide advisory support to Central and State Govt.

### Central Zoo Authority

The Central Zoo Authority (CZA) with its headquarters in New Delhi was established in 1992 under the provisions of the Wild Life (Protection) Act, 1972 to oversee the functioning of zoos in the country with the view to enhance their role in conservation. Central Zoo Authority is a twelve- Member body. Minister of State (IC), Environment & Forests, Government of India is the ex- officio Chairman of the Central Zoo Authority and Member Secretary, Central Zoo Authority is the Chief Executive Officer of the Authority.

For carrying out functions of the Central Zoo Authority, two committees namely Administrative Committee under the Chairmanship of Director General of Forests & Special Secy. and Technical Committee under the Chairmanship of Additional Director General of Forests (Wildlife) and one Expert Group on Zoo Designing, have been formed with Member Secretary as 'convenor' for advising the authority on improvement of the zoos. The functions assigned to the Authority under the Wild Life (Protection) Act are:

- (a) To specify the minimum standards for housing, upkeep and veterinary care of the animals kept in zoos;
- (b) To evaluate and assess the functioning of the zoos with respect to the prescribed standards or norms;
- (c) To recognize or derecognize zoos;
- (d) To identify endangered species of wild animals for purposes of captive breeding and assigning responsibility in this regard to a zoo;
- (e) To coordinate the acquisition, exchange and loaning of animals for breeding purpose;
- (f) To ensure maintenance of studbooks of endangered species of wild animals

bred in captivity;

- (g) To identify priorities and themes with regard to display of captive animals in zoos;
- (h) To coordinate training of zoo personnel in India and outside India;
- (i) To coordinate research in captive breeding and educational programmes for the purposes of zoos;
- (j) To provide technical and other assistance to zoos for their proper management and development on scientific lines;
- (k) To perform such other functions as may be necessary to carry out the purposes of this Act with regard to zoos.

### Finance

The Central Zoo Authority has received Rs.1,735 lakhs during the financial year 2011-12 as Grants-in-Aid from Ministry of Environment & Forests, Government of India. Out of this, Rs.11.69 lakhs have been released as Grants-in-Aid to public sector zoos and other organizations as on 31<sup>st</sup> January, 2012

### Accounts and audits

Accounts of the Central Zoo Authority will be audited by the Scientific Departments of the Comptroller & Auditor General of India, New Delhi.

### Recognition of Zoo Rules, 2009

The Central Zoo Authority is revising the evaluation format of the zoos in order to ensure performance of the zoos vis-à-vis Recognition of Zoo Rules, 2009. Two more amendment are also proposed in Recognition of Zoo Rules, 2009 to revise the criteria of classification of zoos and constitution of Zoo Foundation by each zoo to have provision ploughing back the revenue generated by zoo for development activities.

### Evaluation of zoos

The Central Zoo Authority evaluated four large, six Medium, 17 small and 14 mini zoos, five rescue centre and 22 circuses as on 31<sup>st</sup> January 2012.

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### Recognition/ de-recognition of zoos

The Central Zoo Authority provided recognition to four large, six Medium, 17 small and 14 mini zoos, five rescue centre and 22 circuses as on 31<sup>st</sup> January, 2012. There are 198 recognized zoos (including circuses) in the country.

### Conservation Breeding Programme

The Central Zoo Authority is coordinating planned Conservation Breeding Programme of 73 identified critically endangered wild animal species in Indian zoos. During the financial year 2011-12, the Central Zoo Authority has released Rs. 7.52 lakhs to Padmaja Naidu Himalayan Zoological Park for conservation breeding programme of Himalayan Salamander, Darjeeling; Rs. 22.18 lakhs to Jammu & Kashmir Forest Department for Hangul Conservation Breeding Centre; Rs. 2.44 lakhs for the Biologist and Keeper to Sepahikala ZP; Rs. 4.818 lakhs to Padmaja Naidu Himalayan Zoological Park, Darjeeling for Snow leopard and Red panda CBP for installation of night vision cameras for monitoring purpose: Rs.96.83 lakhs to Padmaja Naidu Himalayan Zoological Park for establishing breeding facility for pheasants at Kurseong Dow hill; Rs. 11.51 lakhs to Biological Park Itanagar, Arunachal Pradesh for Hoolock Gibbon Coservation Breeding Programme to meet recurring expenditure on

feed and salary for biologist and keeper; Additional grant of Rs. 2.719 for construction of storing facility to Sepahijala ZP for Conservation Breeding facility ; Rs. 14.0 lakhs to Nandankanan Zoological Park for conservation Breeding of Indian Pangolin under research mode and installation of monitoring cameras; Rs. 43.24 lakhs to Assam State Zoo Guwahati for establishing Conservation Breeding Facility for Golden langur and Rs. 89.20 lakhs to Nagaland Forest Department for the Conservation Breeding facility at old zoo Kohima, Nagaland for Blyth's Tragopan.

Target is to have atleast 100 properly bred and genetically, physically and behaviorally healthy individuals of each targetted species in captivity in India for proper display and as insurance for future exigencies.

### Exchange/Transfer of animals by zoos

Twenty one exchange proposals of animals between Indian zoos and 8 exchange proposals between Indian and foreign zoos have been approved by the authority during the year 2011-12.

### Maintenance of Studbooks

The Central Zoo Authority is compiling the National studbooks/animal profiles of 44 species taken up under the Conservation Breeding Programme. The Wildlife Institute of India, Dehradun has submitted final report to zoos and CZA on preparation and updating the National studbooks of 14 of 44 identified wild animal species.

### Theme/ Planning in zoos

The Central Zoo Authority is assisting



Fig-36. Leopard (*Panthera pardus*) at National Zoological park

recognized zoos in finalization of Master plans for detailed long term future development. The Central Zoo Authority has received 163 detailed Master Plans as on 31st January, 2012. The CZA is also reviewing the previously granted approval for master layout plans of 43 zoos and master plan of the 13 zoos to ensure the more insight of CZA for better development of the zoos.

During the current financial year; CZA has approved layout plan of the 18 zoos.

### Human Resource Development

During the current financial year, the CZA had organized following training programme for the human resource development in the zoos:

- The Central Zoo Authority in collaboration with Nehru Zoological Park, Hyderabad organized a workshop on "Landscape planning and zoo designing" for the zoo Directors working in the zoos at Hyderabad from 2<sup>nd</sup> November to 6<sup>th</sup> November 2011. This workshop also had one day back to back workshop on "various aspects of master planning of zoos" on 6<sup>th</sup> November, 2011. Altogether 65 zoo directors attend the meeting.
- A workshop on "Landscape planning and zoo designing" is being organized for zoo architects/engineers at New Delhi in collaboration with School of Planning and Architectural, New Delhi from February from 24<sup>th</sup> -26<sup>th</sup> February, 2012.
- The Central Zoo Authority in collaboration with National Institute of Animal Welfare, Ballabgarh organized a training programme on "Different aspects of animal welfare in zoos" for the lower level of personnel working in the zoos at Ballabgarh from 9-14<sup>th</sup> May, 2011.
- The Central Zoo Authority organized training programme on "ZIMS software" at Chandigarh from 9-13<sup>th</sup> January 2012 for the record keepers of 21 selected zoos in collaboration with MC Zoological Park, Chhatbir, Chandigarh. Resource persons from ISIS imparted the training to the participants.
- A workshop for the zoo educators on "Conservation and zoo education" is being organized at Bhopal in collaboration with Van Vihar National & Zoo from 27<sup>th</sup> February-1<sup>st</sup> March 2012.
- A stakeholders workshop for the zoo veterinarian and directors on "Standardization of animal diet in Indian zoos" was organized at NAAS Complex of ICAR, New Delhi in collaboration with Indian Veterinary Research Institute, Bareilly on 30<sup>th</sup> January 2012. More than 20 participants attended the meeting.
- The Central Zoo Authority provided financial assistance to zoos organized 2 week training programme at Tirupati (01<sup>st</sup> -14<sup>th</sup> August, 2011), Sakkarbaugh (16<sup>th</sup> - 30<sup>th</sup> January, 2012), Agartala (12<sup>th</sup> -26<sup>th</sup> September, 2011) and Bhubaneswar (16 - 29<sup>th</sup> December, 2011) for the zoo keepers on "Management of carnivores in captivity" on regional basis. More than 100 zoo keepers attended the training programme.
- The Central Zoo Authority sponsored Dr. V Srinivas, Veterinary Officer, Indira Gandhi, Zoological Park, Vishakapatnam was deputed & sponsored by CZA for attending the Endangered Species Recovery Course organized by the Durrell Wildlife Conservation Trust, Jersey UK during 11 to 29<sup>th</sup> July, 2011.
- Shri B.S. Bonal, Member Secretary, Central Zoo Authority attended 6<sup>th</sup> meeting of the WAZA & CBSG held at Prague, Czeck Republic 29<sup>th</sup> September- 6<sup>th</sup> October, 2011.
- The Central Zoo Authority has deputed and sponsored the Director, National

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Zoological Park (NZP) Delhi for attending 7<sup>th</sup> International WAZA Zoo and Aquarium Marketing Conference held at Grandby Zoo, Canada from 13<sup>th</sup>-15<sup>th</sup> June 2011.

### Research

The Central Zoo Authority has awarded small grant research project of grant of Rs.5.13 lakh to Padmaja Naidu Himalayan Zoological Park to conduct study on Red Panda for duration of two year. The Wildlife Institute of India has completed the studbook project for 14 endangered species on preparing and maintenance of the studbooks. Vulture Conservation Breeding Centre Pinjore has drafted a manual on Conservation Breeding of Vultures which is being printed and will be circulated to zoos.

The Central Zoo Authority has approved a proposal on preparing the manual "Management of Birds in captivity" which would papers from various expert

The Central Zoo Authority has drafted guidelines for the better management of zoos following subject and same are under the consideration of approval by the Ministry:

- Guidelines for Developing Framework Mechanism for Mobilizing Corporate Financial Support for Supplementing Management of Zoos.
- Guidelines for the Utilization of Volunteer in Zoo Management in India
- Prioritizing Grant for Financial Assistance To Zoos
- Prioritization of the species to be taken up under the Conservation Breeding Programme
- Protocol for transport of wild animals
- Guidelines for the housing of Exotic animals in India

### Improvement of zoos

The Central Zoo Authority convened meeting of the Technical Committee during the current financial year on 8<sup>th</sup> June (58<sup>th</sup> Meeting),

20<sup>th</sup> September (59<sup>th</sup> Meeting) and 14<sup>th</sup> December 2011 (60<sup>th</sup> Meeting) and 21<sup>st</sup> February 2012 (61<sup>st</sup> Meeting) to discuss the proposal on improvement in zoos, conservation breeding programme, research and trainings, and approval of master plan apart from the other policy level issues. The Expert Group on Conservation Breeding had its three sittings on 28<sup>th</sup> July, 2011 (3<sup>rd</sup> Meeting), 24<sup>th</sup> October 2011 (4<sup>th</sup> Meeting), and 6<sup>th</sup> January 2012 (5<sup>th</sup> Meeting) to discuss the various proposal on Conservation Breeding and preparing guidelines on Conservation Breeding Programme. The Expert Group on Conservation Breeding convened its meeting on 28-29<sup>th</sup> April 2011 (21<sup>st</sup> Meeting), 2<sup>nd</sup> June 2011 (22<sup>nd</sup> Meeting), 1-2<sup>nd</sup> August 2011 (23<sup>rd</sup> Meeting), 6<sup>th</sup> September (24<sup>th</sup> Meeting), 17<sup>th</sup> October (25<sup>th</sup> Meeting), 12<sup>th</sup> December 2011 (26<sup>th</sup> Meeting) and 16<sup>th</sup> February 2012 (27<sup>th</sup> Meeting) to approve the design of the enclosures to be constructed in Indian zoos and to recommend the approval of master lay out plan of the zoos.

### Other activities carried out during the year

The Central Zoo Authority has provided an amount of Rs.424.12 lakh for maintenance including feed and medicines etc. to 7 rescue centres created at Bangalore, Chennai, Tirupathi, Visakhapatnam, Bhopal, Jaipur and South Khairabari (West Bengal) for large number of lions, tigers, leopards, bears and monkeys rescued from the circuses for rehabilitation.

### National Tiger Conservation Authority (NTCA)

#### Introduction and Objective

The Centrally Sponsored Scheme "Project Tiger" was launched in April, 1973 with the objective "to ensure maintenance of a viable population of Tigers in India for scientific, economic, aesthetic, cultural and ecological values, and to preserve for all times, areas

of biological importance as a national heritage for the benefit, education and enjoyment of the people".

### Progress/achievement made during the year

- **Relocation of villages** from the core/critical tiger habitats, as notified by tiger States, for securing 'inviolable space' for tigers vis-à-vis recommendations of the Tiger Task Force, with an enhanced package of Rs. 10 lakhs per family. Based on scientific, empirical data, it has been established that a minimum inviolable area of 800-1200 sq.km. is required for maintaining a viable population of tiger. As reported by States, there are 762 villages/settlements in the core/critical tiger habitats of the country with 48,549 families.
- **Raising, arming, deploying and maintaining the Special Tiger Protection Force** in 13 sensitive tiger reserves, which inter alia, forms the budget announcement of the Finance Minister in February, 2008. This is imperative to step up protection in tiger reserves in a professional manner (so far, the STPF has been constituted only in Karnataka for Nagarahole; funding support has been provided to UP, Uttarakhand and Rajasthan where process of constituting the same is ongoing. Funding has also been provided to Orissa for STPF constitution at Similipal Tiger Reserve).
- **Use of information technology** in wildlife crime prevention. A pilot initiative has been done in the Corbett Tiger Reserve, which needs to be replicated in



Fig-37. Tiger (*Panthera tigris*) in natural habitat

other sensitive tiger reserves as well.

- **Addressing the issue of livelihood dependency** in the fringes of core/critical tiger habitats by supporting the States for managing the buffer/peripheral areas of tiger reserves as a multiple use zone through village level participatory planning for ecodevelopment with reciprocal commitments (out of 40 tiger reserves 25 have notified buffer area).
- **Strengthening infrastructure** in tiger reserves (support for patrolling camps, civil works, wireless communication, water impoundment).
- **Addressing man-wildlife conflicts** to prevent revenge killings, capacity building of frontline personnel.
- **Launching** tiger reserve level monitoring of tiger and its prey (**Phase-IV**).
- **Approval of CCEA** obtained in August, 2011 for enhanced allocation towards village relocation, besides incorporating new components. The Revised Cost Estimate of Project Tiger was approved as Rs. 1216.86 crore during the XI Plan from the earlier Rs. 650 crore of central assistance.

- **New Components:**

- Change in the funding pattern in respect of North Eastern States by increasing the central share from the existing 50% to 90% for Recurring Expenditure, with the States' share becoming 10%. The ongoing support for Non-Recurring Expenditure would continue to be 100%.
- Raising compensation for man-animal conflict to Rs. 2 lakhs in case of loss of human life, 30 per cent of the same for grievous injury and cost of treatment for minor injury.
- Acquisition of private land for making the core/critical tiger habitat inviolate.
- Establishment of Tiger Safari, interpretation/awareness centres under the existing component of 'co-existence agenda in buffer/fringe areas', and management of such centres through the respective Panchayati Raj Institutions.
- Re-introduction of Cheetah in the States of Madhya Pradesh and Rajasthan under the Scheme at a cost of Rs. 50 crore after ensuring the historical co-existence of Cheetah with other carnivores, especially the tiger.
- The NTCA has been strengthened / decentralized with three Regional Offices. There is a need for strengthening the Regional Offices of the NTCA at Nagpur, Guwahati and Bengaluru (AIGs posted at Nagpur and Bengaluru Regional Offices. Process is underway for posting IGFs in the three Regional Offices, besides an AIG at Guwahati).
- **Declaring and consolidated new tiger reserves.** 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. In principle approval have been accorded by the NTCA for the following five tiger reserves: i) Pilibhit (Uttar Pradesh), ii) Ratapani (Madhya Pradesh), iii) Sunabeda (Orissa), iv) Mukundara Hills (including Darrah, Jawahar Sagar and Chambal Wildlife Sanctuaries) (Rajasthan), v) and Kudremukh (Karnataka). The NTCA has accorded final approval for declaring a new tiger reserve namely 'Kawal' in Andhra Pradesh for which notification is awaited from the State.

- Besides, the 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).
- Detailed revised guidelines have been issued for the implementation of Project Tiger and relocation of villages vis-à-vis the provisions of the Wildlife (Protection) Act, 1972 and the Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- The Special Tiger Protection Force (STPF) has been deployed at Bandipur and Nagarhole Tiger Reserve in Karnataka.

**All India Tiger Estimation (2010)**

The second round of country level assessment (2010) relating to status of tigers, co-predators and their prey was released on 28<sup>th</sup> 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).

The 2006 estimation was 1411 (1165 - 1657) tigers.

### Management Effectiveness Evaluation of Tiger Reserves

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 6 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'. 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 7%.

### Regulatory Acts/Rules governing the program and promulgation of new Acts, if any, along with the details.

The Wildlife (Protection) Act, 1972, is the main regulatory Act governing the program. The said Act has been amended in 2006 to provide a separate Chapter (IVB) for strengthening tiger conservation.

**Table-18.** Plan Expenditure as on 30<sup>th</sup> December, 2011

(Rs. in crores)

S. No.	Budget Head	BE	Expenditure	Percentage expenditure w.r.t. BE
	<b>Project Tiger Scheme</b>			
1.	3601 (assistance to States excluding North Eastern Region) Grants-in-aid General	104.90	104.899	100
2.	3601 (assistance to States excluding North Eastern Region) Grants for Creation of Capital Assets	10.00	10.00	100
3.	3601 (assistance to States excluding North Eastern Region) Scheduled Tribe Sub Plan	10.00	10.00	100
4.	3601 (assistance to States excluding North Eastern Region) Scheduled Castes Sub Plan	6.00	6.00	100
5.	2552 (assistance to North Eastern Region)	14.10	14.096	100
6.	2406 (National Tiger Conservation Authority) Grants-in-aid General	4.71	Nil	Nil
7.	2406 (National Tiger Conservation Authority) Grants for Creation of Capital Assets	10.00	10.00	100
	<b>Total</b>	<b>159.71</b>	<b>154.995</b>	<b>97.05</b>

**Table-19.** Amount released during 2011-12 for Centrally Sponsored Scheme Project Tiger (as on 29.02.2012)

(Rs. in lakhs)

S. No.	Tiger Reserve	States	Release of 1st installment
1.	Nagarjunasagar	Andhra Pradesh	154.406
2.	Namdapha	Arunachal Pradesh	75.000
3.	Pakke	Arunachal Pradesh	161.786
4.	Kaziranga	Assam	426.9168
5.	Manas	Assam	479.620
6.	Nameri	Assam	40.972
7.	Valmiki	Bihar	172.193
8.	Achanakmar	Chhattisgarh	494.586
9.	Indravati	Chhattisgarh	106.130
10.	Udanti-Sitanadi	Chhattisgarh	102.010
11.	Palamau	Jharkhand	156.347
12.	Bandipur	Karnataka	213.9504
13.	Bhadra	Karnataka	215.8822
14.	Dandeli-Anshi	Karnataka	159.204
15.	Nagarahole	Karnataka	1123.133
16.	Billigiri Ranganath Temple	Karnataka	118.480
17.	Periyar	Kerala	211.370
18.	Bandhavgarh	Madhya Pradesh	1341.237
19.	Kanha	Madhya Pradesh	1969.670
20.	Panna	Madhya Pradesh	284.796
21.	Pench	Madhya Pradesh	191.530
22.	Sanjay-Dubri	Madhya Pradesh	92.673
23.	Satpura	Madhya Pradesh	310.8056
24.	Melghat	Maharashtra	973.579
25.	Pench	Maharashtra	280.818
26.	Tadoba-Andhari	Maharashtra	2320.5485
27.	Sahyadri	Maharashtra	47.396
28.	Dampa	Mizoram	225.288
29.	Satkosia	Orissa	118.408
30.	Similipal	Orissa	436.6681
31.	Ranthambhore	Rajasthan	0.600
32.	Sariska	Rajasthan	0.000
33.	Kalakkad Mundanthurai	Tamil Nadu	149.128
34.	Mudumalai	Tamil Nadu	191.583
35.	Corbett	Uttarakhand	319.389
36.	Buxa	West Bengal	135.660
37.	Sunderbans	West Bengal	22.000
38.	Dudhwa	Uttar Pradesh	337.4975
39.	Anamalai	Tamil Nadu	204.556
40.	Parambikulam	Kerala	133.710
	<b>TOTAL</b>		<b>14499.5259</b>

## Budget allocation of the scheme during the year and progress of expenditure till date

Details are given in Table-18.

## Implementing organization along with details

The Project is implemented in designated tiger reserves through respective State Governments, as a Centrally Sponsored Scheme. Amount released during 2011-12 for the Centrally Sponsored Scheme of Project Tiger is at Table-19.

## Animal Welfare

The Animal Welfare Board of India (AWBI) (Plan) Scheme relates to provision of assistance for the following type of activities: Financial assistance to Animal Welfare Organisations for maintaining the stray animals in distress and for their treatment. (Financial assistance based on the number of animals kept for their fodder, water, minor treatment etc). Human Education Programmes for the welfare of animals implemented by the AWBI as well as support to AWOs for this purpose. Capital expenditure at the Board's Headquarters i.e. expenditure on non-recurring items such as purchase of Assets/equipments. Expenditure on a variety of other animal welfare activities such as Rescue of Cattle from illegal smuggling and transportation, rehabilitation of rescued circus animals, Lab Animals, inspections, Legal expenses in connection with court cases pertaining to animal welfare, Mobile Clinics.

## Scheme for Provision of Shelter Houses for animals

There are a large number of animals in our country without proper shelter especially in Goshalas/Pinjrapoles. A number of them are not cared for and are left in the streets, either wounded or suffering from various diseases. Though there are shelter houses operating at various places, their number is not adequate and the facilities provided are

insufficient. This scheme endeavours to fill this gap and provide requisite services for the care and protection of uncared for animals by making provision for establishment and maintenance of shelter houses to various NGOs, AWOs, Goshalas etc.

- Under this Scheme, the AWOs are assisted to the extent of 90% of the project cost of the construction of a shelter house with a ceiling of Rs. 25 lakhs including 10% contribution to be made by the AWOs. The amount is released in two equal installments.

## Scheme for Animal Birth Control (ABC) and Immunization of stray dogs

Keeping in view the overpopulation of stray dogs throughout the country and also the increase of human/animal conflict, deaths due to Rabies, this scheme was being implemented by the Animal Welfare Board of India to facilitate sterilization and immunization of stray dogs through the NGOs including SPCAs throughout the country. The Local Governments/Municipal bodies are also showing increased keenness to become stakeholders in the programme. Presently several Municipalities (such as Delhi, Greater Hyderabad) has entered MOU with AWBI to tackle the population with the objective to make the country "Rabies free". There is an urgent need to expand this scheme to cover more Metros & rural areas to address the issue effectively. **Under the scheme, the norms for financial assistance are at Rs. 370/- per dog for pre & post operative care including medicines & ARV and Rs. 75/- per dog for catching and relocation of dog (Total Rs. 445/- per dog).**

## Scheme for provision of Ambulance Services to Animals in Distress.

Under this Scheme, Ambulance/Rescue Vehicles are provided to the NGOs/AWOs / Gaushalas working in the field of animal welfare. The ambulance services are to be

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Fig-38. Scheme for Relief to Animals during Natural Calamities and Unforeseen Circumstances

used for the following purposes:

- to ensure that immediate treatment / first aid is given to sick, injured stray / abandoned animals;
- to act as an outreach to help the poor people whose animals are involved in accidents or affected with disease and are immobile;
- to act as **mobile clinic** to hold camps where animals in a village can be vaccinated and treated;
- to pick up unwanted or hostile animals from human habitations;
- to implement the ABC/AR programme by collecting dogs and then releasing them after sterilization and immunization;

Under this scheme the NGOs/AWOs/ Gaushalas are assisted to the extent of 90% project cost for purchase of a suitable vehicle and equipment, modifications and fittings thereon. The maximum amount of grant-in-aid is limited to Rs. 3.50 lakhs for purchase of the vehicle and Rs. 1.00 lakhs for equipment, modification and fittings thereon.

### Scheme for Relief to Animals during Natural Calamities and Unforeseen Circumstances

Natural calamities are faced every year in the form of floods, cyclones, droughts and earthquakes. In such circumstances there is an immediate requirement for the provision of relief to affected animals by providing fodder, adequate shelter, medical attention otherwise the animals would perish. Apart from this, the financial assistance to some other Natural disaster such as Tsunami, earthquake, etc. is being provided under the said scheme. It is proposed to extension of financial assistance to AWOs, State Governments/UTs, local bodies working in the affected areas for providing relief to the animals affected during natural calamities and for relief of animals rescued from illegal transportation, slaughter, circuses etc. is also under consideration.

- Financial assistance to AWOs / NGOs is proposed to route through State Animal Welfare Board (SAWB) and Society for Prevention of Cruelty to Animals (SPCAs) at State and District level respectively.

### Animal Welfare Division also handles following two schemes:

- Committee for Purpose of Control and Supervision of Experiments on Animals (CPCSEA)
- National Institute of Animal Welfare (NIAW)

### Committee for Purpose of Control & Supervision of Experiments on Animals (CPCSEA)

The main objective of the Prevention of Cruelty to Animals Act (PCA), 1960 is to prevent infliction of unnecessary pain or suffering on animals. Accordingly, the Committee for Purpose of Control and Supervision of Experiments on Animals (CPCSEA) has been constituted under provisions of Section 15 of this Act. The Act provides for the duties and powers of the CPCSEA, and also penalties, in event of contravention of orders made, or conditions imposed by the Committee. The mandate of the Committee is to ensure that while conducting various types of experiments, in connection with medical research or education, animals are not subjected to avoidable pain or suffering. The CPCSEA functions within the ambit of the PCA Act, and Rules frame under it e.g. Rules for Breeding of and Experiments on Animals (Control and Supervision), 1998 as amended.

CPCSEA has been reconstituted on 11<sup>th</sup> November 2010 as a committee of experts from several areas, including medicine, veterinary science, pharmaceuticals, biotechnology, biostatistics, animal behavior and ethics. Apart from this, representative of NGOs/AWOs are also associated with CPCSEA with the approval of Hon'ble Minister. A total of **1603** institutions have been registered by CPCSEA and **492** CPCSEA nominees have been appointed to assist the Committee in its functions. During this financial year, 231 project proposals on large animals have been received and 85 have been approved and 4 large animal

house facilities have been approved. CPCSEA given financial assistance to 6 establishment for conducting workshop for increasing awareness to prevent the cruelty on animals.

### National Institute of Animal Welfare (NIAW)

The National Institute of Animal Welfare (NIAW) has been set up as a subordinate office of the Ministry of Environment and Forests. The objective of NIAW is to impart training and education in Animal Welfare on a diversified basis comprising, among other things, animal management, their behavior and ethics. The aim is to create an enabling environment for fulfillment of the statutory requirements as laid down in the Prevention of Cruelty to Animals Act, 1960. NIAW has been conceptualized as an apex body in the field of animal welfare and its broad mandate covers the need to improve animal welfare through education, research and public outreach. Steering Committee under the Chairmanship of Secretary (E&F) reviewed the functioning of NIAW in its meeting held on 21<sup>st</sup> September 2011 and took number of corrective measures to facilitate the functioning of the Institute.

NIAW is conducting different training courses (In-service/ Internship training/ Capacity building) for the different Stakeholders (Personnel from BSF/ ITBP/ CZA, B.V. Sc. Students, (Dog Catchers/ Gaushala Personnels/ Hon. Animal Welfare Officers) associated with implementation of various animal welfare schemes/ rules. As per the Guidelines of VCI, the internship training programme for 2011-12 has already started from October, 2011 for different Universities (Rajasthan Veterinary University, Bikaner, Bihar Veterinary College, GB Pant, Mathura). During this period 400 students, 80 personnel of Paramilitary forces / Zoo personnel and 210 NGOs / AWOs representative including HAWOs of AWBI have successfully completed different type(s) of training at NIAW. The other major

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initiative taken for practical training, capacity building and Clinical skill, in association with NIB, Noida for PG students. IEC activities for HAWOs / co-opted members of AWBI were also conducted.

### Policy issues and possible options

The Animal Welfare Division proposes to lay emphasis on animal welfare activities during the 11th Plan period inter-alia in terms of:

- Greater sensitization of all categories of agencies/institutions regarding the need for compliance with animal welfare laws.
- Dissemination of information through Ministry's website ([www.envfor.nic.in](http://www.envfor.nic.in)) and under the Right to Information Act, 2005.
- Streamlining of procedures to facilitate compliance with extant laws and procedures and as a measure of good governance.
- Opening up a meaningful dialogue with all affected constituents in a transparent manner to facilitate policy changes wherever required.
- Continuing the efforts to ensure that National Institute of Animal Welfare (NIAW) grows in a stature and evolves into a prestigious body with international presence.
- Recognition of the need to provide a firm institutional basis to statutory bodies such as the CPCSEA.
- Recognition of the need for setting out improved evaluation parameters to assess the performance of ongoing Animal Welfare Schemes.
- Improvement in management of Animal Welfare Schemes as a part of the E-Governance initiative of the Ministry of Environment & Forests.
- Focus on enhancing public awareness of animal welfare issues through greater

role of media and audio visual aids, as also organizing direct outreach programmes, workshops and seminars.

- Greater participation in various international forum to ensure a prominent role for India in shaping the international policy perspective on animal welfare issues.

### Programme issues and possible options

The thrust areas that require focus are described below:

Rabies is one of the most dreadful infectious diseases affecting both human beings and animals. Rabies is prevalent throughout India except the islands of Lakshadweep and Andaman & Nicobar but has a low public health priority. Considering that Rabies is fully preventable disease and the huge expenditure incurred on post-exposure vaccination both in humans as well as animals, there is an urgent need to control and finally eradicate this dreaded disease from India as has been achieved by several European countries as well as South East Asian countries like Malaysia and Singapore.

The AWBI is currently the only agency which is involved with controlling the population of stray/community dogs through its Animal Birth Control (ABC) Programme and administering anti-rabies vaccinations (ARV) to them in some metros of the country. At present approximately 1,00,000 dogs are sterilized/immunized which is grossly inadequate, given the population of street dogs about 20 Million. Under the Animal Birth Control scheme, the norms for financial assistance are at Rs. 370/- per dog for pre & post operative care including medicines & ARV and Rs. 75/- per dog for catching and relocation of dog (Total Rs. 445/- per dog). AWBI has requested to enhance the present cost of sterilization of dogs from Rs.445/- to Rs.800/- to adopt latest technique and less time to recover the animal.

WHO has also recommended controlling the population of dogs through ABC/AR programme rather than killing them, which is inhumane and does not go well with our cultural ethos of love & compassion for animals. This policy also supports rules under Prevention of Cruelty to Animals Act, 1960. (ABC Dogs Rules-2001).

An ambitious programme (Rabies free India) of this nature will require appropriate support from the Planning Commission. Projections for supporting this programme have been made in the following manner:

- Central Sector Schemes - Provision of Shelter Houses for Animals, Provision for Ambulance services to Animals in Distress and Animal Birth Control & Immunization of Stray Dogs will support enhanced ABC operations. Thus additional allocations for these three Central Sector Schemes are proposed on these grounds.
- Plan Fund heads - Humane Education and Awareness, Oral Anti Rabies Vaccinations, Capacity Building, Research and Monitoring will support

other elements of the Rabies Control Programme as described in the preceding paragraphs. Proposed allocations for these have been modeled on the basis of needs of the Rabies Control Programme as well as ongoing animal welfare activities in the country that are in addition to the Rabies control Programme.

### Capacity Building - Gaushalas & ABC

The country's large population of stray / abandoned cattle is supported by a network of Gaushalas and Pinjrapoles, which are in turn provided several types of support by the AWBI. A number of these Gaushalas were set up by philanthropists and individuals and groups, which, though committed to the cause of animal welfare did not necessarily have the management and other capacities required for effective functioning. It is therefore desirable that the AWBI should undertake a special drive over the year 2011-12 to modernize Gaushalas and provide requisite training to Gaushala personnel. Similarly the Veterinary Doctors/ Para Veterinary staff/ Animal Handlers are trained to undertake the new technique of Surgery.

**Table-20.** Progress/Achievement made during 2011-12

	<b>Outlay (In Lakhs)</b>	<b>Quantifiable deliverables</b>	<b>Achievement till 30.11.2011</b>	<b>BE 2012-13 (In Lakhs)</b>	<b>Quantifiable deliverables in 2012-13</b>
AWBI Plan	875.00	900 AWO's	104 AWOs	700.00	750 AWO's
Shelter House	700.00	44 Shelter	3 Shelters	920.00	46 Shelter
ABC Scheme	375.00	110000 ABC's	35506	445.00	110000 Operation
Ambulance Scheme	225.00	45 Ambulances	15	270.00	60 Ambulance
Natural Calamity	10.00	Cannot be fixed	5 AWOs	10.00	Can not be fixed
Committee for the Purpose of Control and Supervision of Experiments on Animal (CPCSEA)	40.00	Cannot be fixed	168 establishments were registered, 85 proposals approved for experiments, 4 Animal House Facilities approved	50.00	Can not be fixed
Nation Institute of Animal Welfare(NIAW)	175.00	26 Training Courses	20 Training Programme	125.00	20 Training Courses

### CPCSEA

It is proposed to step up the level of activities undertaken by CPCSEA in terms of

- Expansion in the coverage of Institutions, which are registered with CPCSEA;
- Emphasis on inspections of animal house facilities throughout the country;
- Appointment of larger number of nominees, who are on board the Institutional Animals Ethics Committees of various institutions;
- Imparting training to these CPCSEA nominees;
- Increasing the focus on public outreach by way of publications, media coverage and seminars, with special emphasis on the scientific community, which relies on use of animals in experimentation.
- Undertaking the IEC activities ( Seminar and other awareness programme)

### National Institute of Animal Welfare (NIAW)

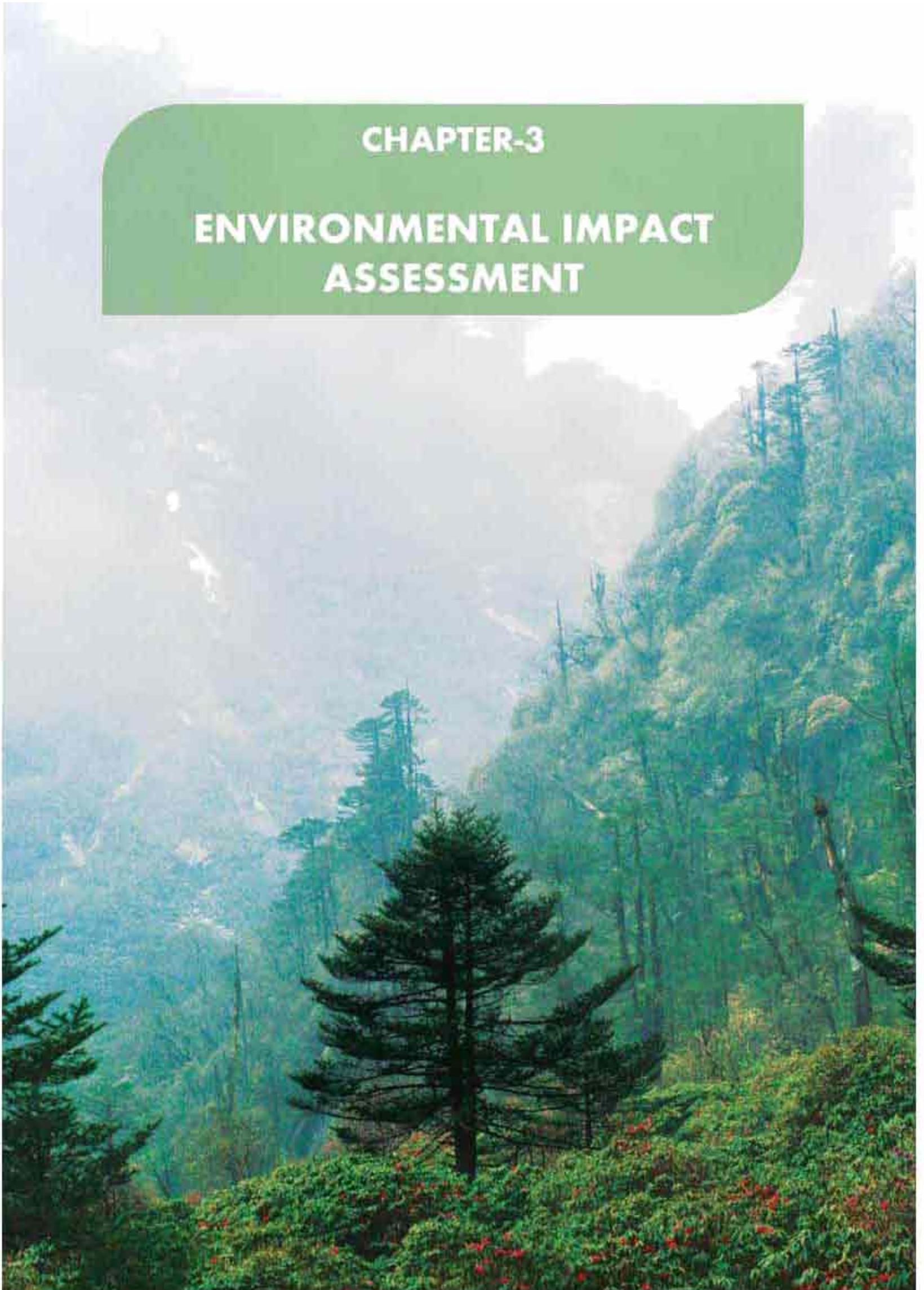
The activities of the Institute are expected to grow significantly during 11<sup>th</sup> Five year 2011-12 in following areas:

- Scope and number of trainings.
- Practical training for capacity building and Clinical up gradation of Veterinary Doctors/ Para Veterinary staff
- Introduction of specialized training in a phased manner with induction of faculty installation of equipment, upgradation of facilities (including provision for new hostels) as also functioning of an animal hospital and first-aid service through Mobile clinic.
- Activities to undertake Information, communication and Education to all the stakeholders

The budget of 2011-12 and proposed BE for 2012-13 along with physical target is summarized in Table-20.

## CHAPTER-3

# ENVIRONMENTAL IMPACT ASSESSMENT



## Environment Impact Assessment (EIA)

### Environment Impact Assessment Notification 2006

The Environmental Impact Assessment has been used as a management tool to minimize adverse impacts of the developmental projects on the environment and to achieve sustainable development through timely, adequate, corrective and protective mitigation measures. The Ministry of Environment and Forests (MoEF) has used Environmental Impact Assessment Notification 2006 as a major tool to regulate rapid industrial development of the country for minimizing the adverse impact on environment and reversing the trends which may lead to climate change in long run.

The developmental projects have been re-categorised into category 'A' and category 'B' depending on their threshold capacity and likely pollution potential in the re-engineered Environmental Impact Assessment (EIA) Notification of September 2006, requiring prior Environmental Clearance (EC) from MoEF or the concerned State Environmental Impact Assessment Authorities (SEIAAs). Further the notification provided for screening, scoping, public consultation and appraisal of project proposals.

### Amended EIA Notification 2009

With a view to further simplify the procedure for obtaining the environmental clearance without compromising or diluting the regulatory framework, the EIA notification has been amended in December, 2009. It exempts the biomass based power plants up to 15 MW, power plants based on non hazardous municipal solid waste and power plants based on waste heat recovery boilers without using auxiliary fuel from the EC process.

### Environmental Clearance to Developmental Projects

As per the provisions of the EIA

Notification 2006, several meetings of the Expert Appraisal Committees were convened by the Ministry during the year for appraisal of category "A" projects from sectors of industry, thermal power, infrastructure, river valley, mining and category "B" projects from States where SEIAAs have not been constituted/ reconstituted. As part of appraisal process, wherever required, the Expert Appraisal Committees also visited project sites for obtaining first hand information about the ground level realities and response of people living in the vicinity. Environmental Clearance (EC) was accorded to three hundred fifty three projects and Terms of Reference (TOR) were assigned to four hundred twenty three projects (between April to December, 2011). The sector wise list of environmental clearances and TOR issued to the projects by the Ministry is given in the Table-21.

### Constitution of State Environmental Impact Assessment Authorities (SEIAA)

The Ministry has so far constituted twenty seven State/UT level Environmental Impact Assessment Authorities [SEIAA51/State Expert Appraisal Committees (SEACs) under sub-section[3] of section 3 of the Environment [Protection] Act, 1986 for appraisal of Category 'B' projects and activities notified in the EIA Notification 2006.

### Post Project Monitoring of Environment Clearance Conditions

The objectives of Post Project Clearance Monitoring are (i) to ensure that actions have been taken to incorporate the environmental safeguards during the project cycle in accordance with the conditions stipulated in the Environmental Clearance letter; and (ii) to take appropriate corrective measures to check adverse impact on environment during operation of the respective projects. The Category 'B' projects which have been accorded environmental clearance by the SEIAAs/SEACs are also monitored for compliance of the conditions.

**Table-21.** Status of Environment Clearance and TOR issued to Projects (April 2011- December 2011)

S. No.	Nature of the Project	Cleared		Pending		Rejected/ withdrawn	
		EC	TOR	EC	TOR	EC	TOR
1.	Industry	150	135	181	188	11	-
2.	Thermal	27	81	36	34	4	1
3.	River Valley and Hydroelectric	8	5	13	22	-	-
4.	Mining (Coal & Non Coal)	56	125	127	111	8	16
5.	Infrastructure & Construction	112	74	119	22	-	20
6.	Nuclear	-	3	-	-	-	-
	<b>Total</b>	<b>353</b>	<b>423</b>	<b>476</b>	<b>377</b>	<b>23</b>	<b>37</b>

Note: EC - Environment Clearance TOR - Terms of Reference

Monitoring of projects with respect to conditions stipulated in the environmental clearance issued under EIA Notification 2006 and Coastal Regulation Zone 2011 is carried out through the six Regional Offices. The monitoring report is scrutinized in the Ministry and on that basis appropriate action is contemplated under the Environment (Protection) Act, 1986 for violation of environmental clearance conditions. A procedure has been laid down for issuing show cause notice, closure of industry etc. in September 2009 which is placed on the website of the Ministry.

Till December, 2011, six hundred twenty one projects have been monitored by the regional offices of the Ministry. Based on the observations made during field visit, necessary follow up action has been taken with the project proponents to ensure an effective compliance to the EC conditions. The monitoring cell in the Ministry, besides providing policy guidelines to these regional offices, also examines the monitoring reports submitted by Regional Offices. In cases of major non compliance further follow up

action is taken for effecting compliance including issue of show cause notice followed by directions on case to case basis.

Ministry had constituted a committee in December, 2009 under the chairmanship of Additional Secretary to examine the monitoring process adopted to check compliance with the stipulated conditions and environmental safeguards prescribed while granting environmental clearance under EIA and CRZ Notifications and to suggest effective monitoring mechanism. The committee has since submitted its report which has been accepted by the Government.

The Committee constituted under the chairmanship of Former Member Secretary, Central Pollution Control Board (CPCB) with representatives from the Regional Offices of MoEF and CPCB to develop criteria and formulate guidelines for categorization of non-compliances into the category of serious and not so serious submitted its report in September, 2011. The report has been put in public domain on the website of Ministry to obtain comments/suggestions before its finalization.

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Fig-39. Moderate dense forests at Mandi, Himachal Pradesh

### **Accreditation of the EIA consultants with Quality Council of India (QCI)/ National Accreditation Board of Education and Training (NABET)**

The Environmental Appraisal of Development projects is undertaken as per the provisions of the Environmental Impact Assessment Notification, 2006 based on the EIA/EMP Reports prepared by the project proponents with the assistance of their consultants. Good quality EIA Reports are a prerequisite for appropriate decision making. Therefore, all the Consultants/public Sector Undertakings (PSUs) / Universities and Research Institutes working in the area of Environmental Impact Assessment were required to get themselves registered under the scheme of Accreditation and Registration of the National Accreditation Board of Education and Training (NABET) and the Quality Council of India (QCI) by 30<sup>th</sup> June, 2011. No EIA/EMP Reports prepared by such consultants

who are not registered with NABET/QCI are being considered by the Ministry after 30<sup>th</sup> June, 2011.

### **EIA Manuals**

Expert Appraisal Committees at the Centre and State/UT Environmental Impact Assessment Authorities (SEIAAs) and State Level Expert Appraisal Committees (SEACs) in the various States, have been assigned the task of screening, scoping and appraisal of projects of various sectors for grant of environmental clearance (EC). In order to help in standardizing the quality of appraisal Sector specific Manuals have been prepared by the Ministry with the help of Administrative Staff College of India (ASCI), Hyderabad and the IL&FS Ecosmart Ltd., for the thirty seven sectors/activities listed in the EIA Notification 2006. They include Model TORs, technological options, processes for a cleaner production, waste minimization, monitoring of environmental quality, related regulations,

and procedure of obtaining EC etc. and are serving as Guidance manual to the sector specific EACs.

The sectors covered include Mining, Airports, Ports & Harbours, Nuclear Power etc. Thermal Power, Distilleries, Oil & Gas transportation pipeline, Oil Refineries, Petrochemical plants, Ship Breaking Yards etc. The Manuals have been uploaded on the website of the Ministry to not only give wider dissemination to all stakeholders but also to enhance transparency on the EC process.

### Coastal Regulation Zone and Society of Integrated Coastal Management (SICOM)

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.

The salient provisions of the 2011 Notification are:

- Water area up to 12 nautical miles and the tidal influenced water bodies have been included under the Coastal Regulation Zone areas in order to:
  - control the discharge of untreated sewage, effluents and the disposal of

solid wastes as such activities endanger the fish and their ecosystem;

- conserve and protect habitats in the marine area such as corals and coral reefs and associated biodiversity, marine sanctuaries and biosphere reserves, sea grass beds etc., which act as spawning, nursery and rearing grounds for fish and fisheries;
- regulate activities in the marine and coastal waters such as dredging, sand mining, discharge of waste from ships, construction like groynes, breakwaters, etc., including reclamation which have serious impacts on fishing and allied activities;
- enable studies of the coastal and marine waters with regard to the impact of the climate change and the occurrence of disasters which has serious impacts on the livelihood and property of the fisher-folk communities;
- No restrictions are imposed on any fishing activities and allied activities of the traditional fishing communities in this area.

- To invite comments on the draft Coastal Zone Management Plan from stakeholders. This will ensure that for the first time, local communities including fishermen communities will have a say in the preparation of the CZMPs.
- The notification allows infrastructural facilities for the local fishing communities to be constructed in the CRZ-III area.
- Port and harbour projects are not permissible in high eroding stretches except for defence projects.

Further, in view of the livelihood security of coastal communities the Ministry of Environment and Forests has initiated an Integrated Coastal Zone Management Project with the World Bank assistance at an outlay of about Rs. 1153 crores. Under this project,

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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 CZM projects having four major components namely, (i) National Coastal Management Programme, and three ICZM projects in three States namely, Gujarat, Orissa and West Bengal.

Under the National component the demarcation of the hazard line has been assigned to Survey of India for mapping the entire coastline 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. The Centre would address the issues related to research & development, coastal management and coastal communities. In view of the historical importance of Salt Satyagraha undertaken at Dandi and surrounding villages and at Vedaranyam by Mahatma Gandhi and Shri Rajaji respectively, implementation of Integrated Coastal Zone Management Project at these places has been undertaken as a major initiative by SICOM.

Under this project, the State level components are being implemented at Gulf of Kachchh in Gujarat (Rs.298 crores), Paradip-Dhamra and Gopalpur-Chilka stretch in Orissa (Rs.202crores) and Digha-Shankarpur and Sagar islands in West Bengal (Rs.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.

### Study on carrying capacity based planning for proposed development in Goa

The regional carrying capacity study for Goa region being carried out by the Indian School of Mines (ISM), Dhanbad is aimed at delineating a framework for economic development and decision making in mining sector based on assimilative capacity estimation. It is also inter-alia aimed at addressing the regional environmental management planning with an underlying objective of enhancing the quality of life and to minimize the environmental and ecological degradation. The project on Regional EIA of mining belt of Goa region will assess the impacts of the existing iron ore mines as well as other mining activities along with other major anthropogenic activities (individually as well as cumulatively) for delineating the framework for the future mining activities in the defined study area leading to environmentally sustainable development. The broad scope of studies are:

- Identification of regions (core impacted zone of air and water environment, land area-administrative boundaries etc.) based on likely spatial impacts and homogeneity/topography
- Assessment of current status of temporal & spatial pollution profiles of different environmental components
- Delineation of sources of pollution and quantification of pollution loads for current as well as future growth scenarios
- Characterization of environmental status receptors for selection of Hotspots and calibration of predictive modelling
- Development of cause-impact framework for predicting residual assimilative capacity for the future growth scenarios with and without mitigation options
- Assessment of congestion levels based on environmental standards for receptors

- Delineation of Regional Management Plans & Growth options in terms of time and space within the assimilative capacity thresholds for critical environmental resources.

### Major Policy decisions taken during the year

#### - **Extension of Moratorium up to 31<sup>st</sup> March, 2012**

Ministry had imposed a moratorium till 31<sup>st</sup> August, 2010 on consideration of projects for environmental clearance to be located in 43 critically polluted areas/ industrial clusters identified by Central Pollution Control Board. It was envisaged that during the period of moratorium, time bound action plans will be prepared by the respective SPCBs/PCCs for improvement of the environmental quality in these industrial clusters/areas. The action plans so prepared would be finalized by CPCB. The status of preparation of action plans has been reviewed in the Ministry from time to time. In accordance with the information received from CPCB that the respective SPCBs and the local stakeholders have initiated work on implementation of the submitted action plans moratorium was lifted on consideration of projects for environmental clearance in the 25 industrial clusters/areas. In the remaining 18 identified critically polluted industrial clusters/areas, it has been decided to extend the moratorium further up to 31<sup>st</sup> March, 2012.

#### - **Consideration of expansion of thermal power projects**

It has been decided that the proposal for expansion of projects to which environmental clearance has been granted can be considered only once the implementation for the earlier phase has commenced. In case environmental clearance for the earlier proposal is yet

to be accorded, the project proponent shall apply afresh and submit a comprehensive proposal for the entire project by clubbing all the phases so that the environmental issues could be addressed holistically.

#### - **Mining projects from the districts of Bellary, Tumkur and Chitradurga in Karnataka**

Pursuant to the orders of Hon'ble Supreme Court, it has been decided that MoEF/SEIAA will not consider any mining proposal from these three districts till the Hon'ble Supreme Court lifts the ban on consideration of projects in these areas.

#### - **Consideration of projects for grant of EC under which involve Forestland**

It was decided that the following procedure will be adopted for consideration of projects for environmental clearance which involve forest land:

- At the stage of consideration of proposals for TOR in respect of the projects involving forest land, the project proponents would submit a credible proof in support of the fact that they have already submitted their application to the concerned Competent Authority for diversion of the forestland involved in the project.
- At the stage of consideration of proposals for EC in respect of projects involving forest land, the project proponent would inform the respective EACs about the status of their application for forestry clearance along with necessary supporting documents from the concerned Forest Authorities. It will clearly be informed to the EAC whether the application is at the State Level or at the Central level. The EAC will take cognizance of the involvement of forestland and

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its status in terms of forestry clearance and make recommendations on the project on its merits. After the EAC has recommended the project for environmental clearance, it would be processed for obtaining decision of the Competent Authority for grant of environmental clearance. In the cases where the Competent Authority has approved the grant of Environmental clearance, the proponent will be informed of the same and a time limit of 12 months, which may be extended in exceptional circumstances to 18 months, a decision on which will be taken by the competent authority, will be given to the proponent to submit the requisite stage-I forestry clearance. The formal environmental clearance will be issued only after the Stage-I forestry clearance has been submitted by the proponent.

– **Reclassification of CRZ area on the grounds of "Error apparent on face of the Record"**

It was decided that any proposal for reclassification citing the ground of "error evident on record" should be preceded by an in depth examination by the State/Union Territory Coastal Zone Management Authority (CZMA) concerned bringing out clearly the error on record because of which the area/plot in question either does not fall in the CRZ, or has been wrongly classified; the Authority/officials responsible for the error, as to how the error is proposed to be rectified, the corroborative/independent evidence supporting the proposed rectification of error-in the form of satellite imagery, Survey of India map, etc. and the conduct of field verification by Experts, which should include one Expert from one of the Agencies authorized by MoEF for demarcating High Tide Line. It may be

ensured that the Expert for the field verification should not be from the same authorized agency, which demarcated the High Tide Line, on record, for the area/ plot in question.

After following the above procedure, the SCZMAs may recommend a proposal for reclassification on the ground of "error evident on record" to the National Coastal Zone Management Authority (NCZMA) for its consideration.

– **EC for setting up of Solar Thermal Power Plants under Jawaharlal Nehru National Solar Mission (JNNSM)**

Solar Thermal Power projects are not covered by the provisions of EIA Notification, 2006. However, keeping in view the extent of land required for such projects, it has been decided that:

- State Pollution Control Board/UTPCC before issuing consent to establish under Air and Water Act to such units may ensure and satisfy themselves by undertaking a site visit that the proposed area does not involve; (i) any wet land, (ii) any agriculture land, (iii) ecologically sensitive area, (iv) areas rich in bio-diversity, (v) areas with large habitation. In case, any displacement of habitation is involved, the requisite R&R and CSR should be put in place as per the norms of the respective State Government. Further, if the area involves any forestland, it needs to be ensured that the requisite prior forestry clearance for diversion of forestland has also been obtained under the FC Act.
- In addition, the site should also conform to the provisions of the CRZ Notification, 2011 as requisite prior commitment from the Competent Authority for availability should be ensured.

- The land so made available for the solar thermal power plant will not be deviated for any other purpose.

- **Priority for consideration of Green Building Projects**

It was decided that the proposal for obtaining environmental clearance in respect of Building and Construction projects which have obtained Green Building rating (pre-classification of provisional certification) under the rating programmes of GRIHA, IGBC including LEED India etc. by integrating high level of environmental norms into their building plans, shall get priority for their consideration, out of turn, by the EAC/ SEAC as the case may be.

- **Consideration of proposals regarding Ratnagiri and Sindhudurg districts, Maharashtra**

It has been decided to extend the moratorium for consideration of projects received by the Ministry or by the Maharashtra State Environmental Impact Assessment Authority (SEIAA) in Sindhudurg and Ratnagiri Districts, Maharashtra upto 31<sup>st</sup> March, 2012.

- **Corporate Environment Policy**

To bring into focus environmental commitment in the corporate sector, so that all the project proponents integrate environmental concerns into their day-to-day functioning especially the compliance with the conditions of clearances.

It is felt appropriate that all the Central PSUs and major projects of coal based thermal power plants with capacity of 500 MW and above, integrated

Steel plants with capacity of one MTPA and above and cement plant with capacity of three MTPA and above and petroleum refining industries need to:-

- Adopt well laid down corporate Environment Policy

- Ensure, as a part of this policy, adherence with the EC and Forestry clearance wherever applicable, granted to the company

- Ensure that inter-alia the company functions in conformity with the policy

- Ensure that deviations, if any, from this Policy and cases of violations of environmental and forestry clearance conditions that have been found by this Ministry or other public authorities should be duly reported to its Board of Directors and desirably reflected thereafter on its website and in its annual report.

- Identify and designate responsible person(s) at all levels of their hierarchy for ensuring adherence to this policy and compliance with Environmental Laws and regulations.

These measures to promote environmental consciousness and secure compliance will surely protect the project's stakeholders just like financial systems and audit mechanisms protect the shareholders of a company.

- **Consideration of proposals involving violation of the Environment (Protection) Act, 1986 or Environmental Impact Assessment (EIA) Notification, 2006/CRZ Notification, 1991/2011**

Instances have come to notice of the Ministry where substantial physical progress relating to construction of the project has been made at site and significant investments made without obtaining a requisite prior environmental clearances as is mandated under the EIA Notification, 2006.

It has been decided that in all such cases of violation submitted to the Ministry and subsequent to the recommendation of

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EAC/SEAC and after the approval of the competent authority for grant of environmental clearance, MoEF/SEIAA will send a communication to the project proponent informing that although the proposal has been approved by the Competent Authority, formal environmental clearance will be issued to the project only after the matter relating to the violations have been put up to the Board of Directors of the company or to the Managing Committee/ CEO of the Society, Trust, partnership/ individually owned concerned for consideration of its environment related policy/plan of action as also a written commitment in the form of a formal resolution to be submitted to MoEF/ SEIAA to ensure that violations of the Environment (Protection) Act etc. will not be repeated. For the purpose, a time limit of 90 days will be given to project proponent.

Respective State Government will also be informed of the violation cases for their initiating legal action against the company as per the procedure prescribed.

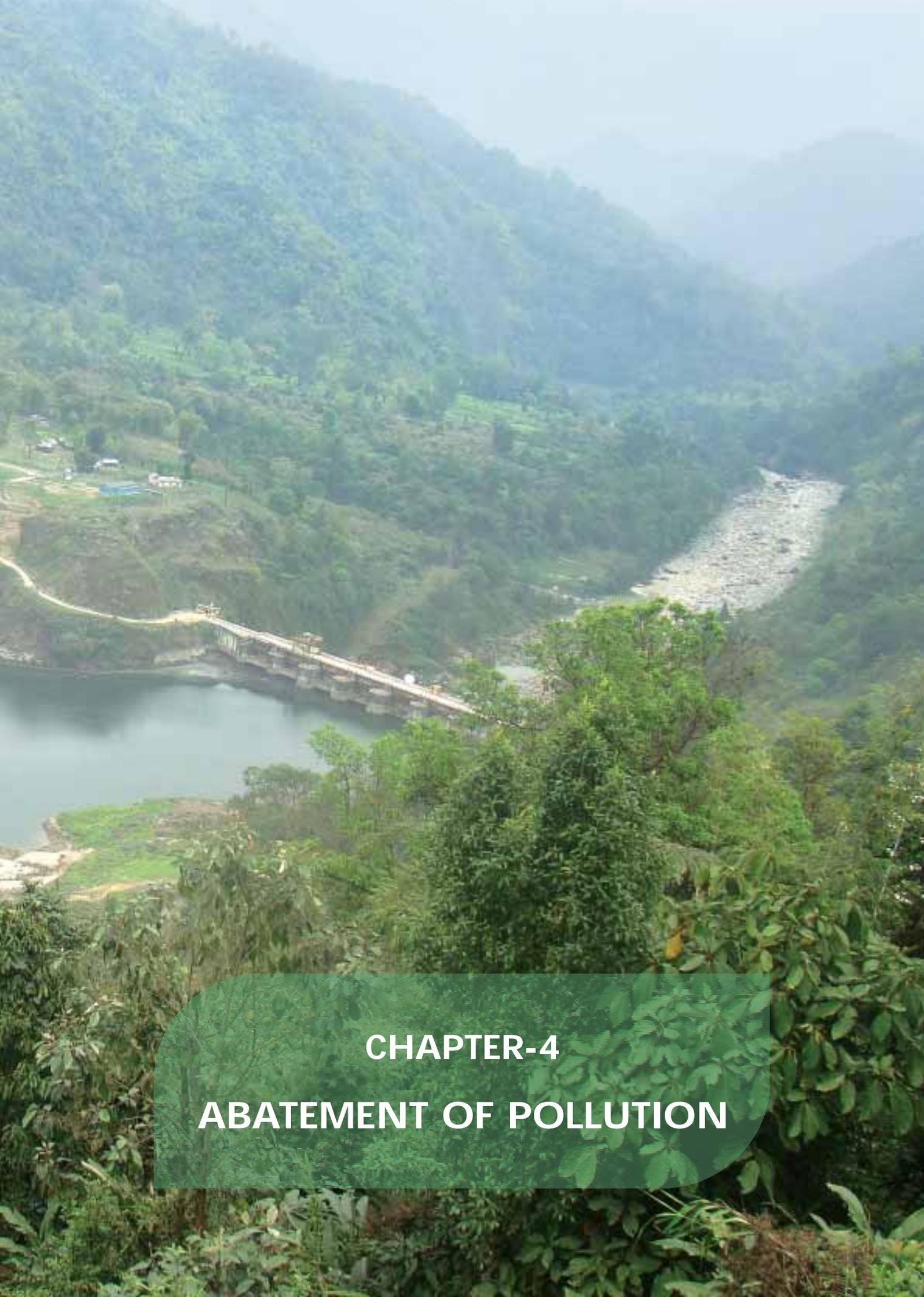
– **Firm coal linkage**

As per the policy decision taken project proponents are required to indicate firm coal linkage along with coal characteristics for all project proposals relating to thermal power projects, steel, sponge iron and any other such projects, which are largely dependent on availability of coal as a raw material, at

the time of seeking Environmental Clearance. The status of environment and forestry clearance of the coal block also needs to be informed. In case of projects which are based on imported coal, a copy of firm Memorandum of Understanding (MoU) signed between the coal supplier and the project proponent is required.

### Coal Mining Sector

Ministry continues to consider coal Mining projects of Jharia Coalfields and Raniganj Coalfields based on cluster approach which includes existing mines, closed mines, abandoned mines and proposed mines in the two coalfields. The Integrated EIA-EMP for the cluster of mines should indicate the present status of mines, environmental quality and the extent of pollution load from each mine. The combined pollution load from the cluster of mines that would be reduced by taking suitable mitigation measures by the individual mines through an Integrated Environmental Management Plan should be indicated along with the expected improvement in the environmental quality. The Environmental Management Plan for each cluster would dovetail the plan for addressing subsidence and fire control and resettlement of habitation from unstable sites and fire affected areas in the Jharia Coalfields under the Jharia Action Plan and subsidence and rehabilitation of habitation from unstable areas in the Raniganj Coalfields under the Raniganj Action Plan. A number of projects have been considered based on above approach during the year 2011-12.



## CHAPTER-4

# ABATEMENT OF POLLUTION

## Control of Pollution

### Introduction

The concern for environmental quality has become the top most issue in the present scenario of rising population, increasing urbanization, industrial pollution, shipping, aviation and vehicular emission as well as pollution of water courses due to discharge of industrial effluents and sewage without conforming to the environmental norms and standards apart from agriculture run-off. Realising this trend of pollution in various environmental media like air, water, soil, etc., the Government earlier adopted Policy for Abatement of Pollution in 1992, which provides multi-pronged strategies in the form of regulations, legislations, agreements, fiscal incentives and other measures to prevent and abate pollution. To give effect to various measures and policies for pollution control, various steps have been initiated which include stringent regulations, development of environmental standards and periodical revision therein, control of vehicular pollution, control of air and water pollution, abatement and prevention of noise pollution, spatial environmental planning, revisit and revision in the list of critically polluted areas and improvement plans therein, etc. The Government also adopted National Conservation Strategy and Policy Statement on Environment and Development, 1992. Afterwards, the Government adopted the National Environment Policy (NEP- 2006) which seeks to extend the coverage, and fill in gaps that still exists, in light of present knowledge and accumulated experience. This policy does not displace, but builds on the earlier policies of the Government. It lays emphasis on a number of new issues.

Progress of Activities Undertaken under various programmes are as follows:

### Control of Air Pollution

- The air pollution and the resultant 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, therefore, 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 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, 530 ambient air quality monitoring stations are operational covering 211 cities, towns and industrial areas in 26 States and five Union Territories. Presently, three out of five criteria pollutants namely; sulphur dioxide ( $\text{SO}_2$ ), nitrogen dioxides ( $\text{NO}_2$ ) and fine particulate matter having size less than 10 micron ( $\text{PM}_{10}$ ) are monitored under National Ambient Air Monitoring Programme (NAMP) by the Pollution Control Boards, Pollution Control Committees, Universities and Research Institutes. Besides, additional pollutants for other toxic trace matters and polycyclic aromatic hydrocarbons are also being monitored in selected cities of the country. Installation of automatic air quality monitoring stations is undertaken in cities for continuous monitoring. The continuous monitoring has been introduced in twenty seven cities namely, Agra, Ahmedabad, Bengaluru, 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 84 manual monitoring stations covering 29 new cities and towns have been added in the network under NAMP during the 2011-12.

- The Government has published the Revised National Ambient Air Quality Standards, 2009 (NAAQS-2009) in the official Gazette on 16<sup>th</sup> November, 2009. These ambient air quality standards/ limits provide a legal framework for the control of air pollution and the protection of public health.
  - Standard monitoring protocol to monitor 12 pollutants as per NAAQS has been developed during the year.
  - In furtherance of these Standards, the CPCB is in the process of drawing a road-map for the creation of required infrastructure, operation and maintenance of network and handling of data.
  - The monitored ambient air quality data during the year while comparing with revised (NAAQS-2009) indicates that the annual average levels of Sulphur Dioxide (SO<sub>2</sub>) are within the prescribed air quality norms across the country and that of Nitrogen Dioxide (NO<sub>2</sub>) are within norms in most of the cities. However, the levels of fine particulate matter (PM<sub>10</sub>) exceed the prescribed norms in many cities including Delhi. PM<sub>10</sub> and NO<sub>2</sub> are the emerging air pollutants.
- sponsored umbrella scheme of 'Pollution Abatement'. The scheme of assistance for pollution abatement comprise of following sub-components:
    - Grants-in-aid-General
    - Grants for creation of Capital Assets
    - Environment Health Cell (EHC) & Trade and Environment (PL)
    - North Eastern Region Grants-in-aid-General & for creation of Capital Assets
  - The Scheme provides 100 % grant to SPCBs/PCCs, Governmental and non-Governmental organizations.
  - Under this scheme, grants are being provided to the State Pollution Control Boards/UT Pollution Control Committees, Environment Departments, Central/State Research Institutes, and other government agencies/organizations with the aim of strengthening their technical capabilities to achieve the objectives of the Policy Statement. Assistance is also provided to North Eastern Pollution Control Boards & Pollution Control Committees as salary support for the technical staff. In addition, support is also extended for undertaking projects for Abatement of Pollution.
  - Financial assistance has been extended to six State Pollution Control Boards/UT Pollution Control Committees during the current financial year.
  - The scheme is being proposed to revise with the followings:
    - Lab up-gradation, purchase of equipment, salary support (limited to scientific and technical staff) and construction of office -cum-laboratory building of SPCBs of NE States.
    - Capacity Building of SPCBs/PCCs including other environmental organizations by imparting training and education through semi-Governmental organizations.

#### Assistance for Abatement of Pollution

- The scheme "Assistance for Abatement of Pollution" is being implemented by the Ministry of Environment and Forests since Seventh Five Year Plan (1990-1995). The scheme had an allocation of Rs 45 crore in the XI Five Year Plan (including Policy & law and Environmental Health Cell scheme). The scheme of Assistance for Abatement of Pollution is a Centrally Sponsored Scheme.
- The objective of the scheme inter alia to strengthen SPCBs for enforcing statutory provisions for pollution abatement. The scheme is now a part of a centrally

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- Awareness and education for R&D, survey and documentation for creation of environmental database and consultation in the area of pollution abatement will be expected through scientific and semi-Governmental Organizations.
- Seminars/Workshops/Conference in the area of pollution abatement through semi-Governmental Organization having domain expertise.

### Auto Fuel Policy

The Ministry of Petroleum and Natural Gas(MoP&NG), Government of India has enunciated an Auto Fuel Policy (2002) which aims to comprehensively and holistically address the issues of vehicular emissions, vehicular technologies and auto fuel quality in a cost-efficient manner while ensuring the security of fuel supply. The Government has also published Gazette Notification vide G.S.R 84(E) on 9<sup>th</sup> February, 2009 for introducing Bharat Stage IV and III norms, as applicable, for new vehicles in selected cities. The Policy objectives include ensuring sustainable, safe, affordable and uninterrupted supply of auto fuels; optimum utilization of infrastructure for import of crude and crude products, processing and production, and the storage and transportation; assessing the future trends in emissions and air quality requirements from view point of public health; adopting such vehicular emission standards that will be able to make a decisive impact on air quality etc. The Policy provides for a road map for reduction in vehicular emission norms for new vehicles as well as for reduction of pollution from in-use vehicles. It also sets standards for quality of fuel and other kits. The report of the Source Apportionment studies that has been recently published and carried by MoEF/ CPCB along with MoPNG has also recommend supply of uniform fuel quality all over the country.

### Source Apportionment Studies

- Due to multiplicity and complexity of air polluting sources, apportionment of contribution to ambient air pollution from these sources is important for planning cost effective pollution control strategies. In view of this, to evaluate contribution of particulate matter from various sources to air quality, Source Apportionment Studies (SAS) have been completed for six cities namely; Delhi, Bangalore, Chennai, Mumbai, Pune and Kanpur in association with the institutions like NEERI, Nagpur, TERI, New Delhi, IIT, Chennai, ARAI, Pune and IIT, Kanpur. The objective frame work for Source Apportionment Studies included preparation of emission inventory, emission profile, monitoring of ambient air quality, assessment of data and its authentication and source apportionment of PM<sub>10</sub> using factor analysis and receptor modeling etc. Application of Chemical Mass Balance (CMB-8) Receptor model and ISC dispersion model have been used in the study.
- The results of the Study, so obtained were evaluated by the Technical Committee. International Peer Review of the study has been organized in Spain, Germany (through GTZ) and within the country, since such source apportionment studies have been carried out for the first time in India and the outcome of this Study would be used for future policy decisions such as Auto Fuel Policy.

Based on the experiences gained and outcomes of the study, following are suggested as future course of action:

- At national level, thematic Ministries have been requested to set up six working groups to deal with the sectoral recommendations of the study which would be housed in the respective thematic Ministries:

- Group for working on road quality improvement and minimizing re-suspension of road dust, development of progressive vehicle exhaust norms, etc. : *thematic Ministry*- Ministry of Road Transport & Highways.
- Group on improvement of fuel quality : *thematic Ministry*- Ministry of Petroleum & Natural Gas.
- Group to deal with old vehicles – retrofitment of pollution control devices, scrap policy, inspection & maintenance issues, etc. : *thematic Ministry* - Ministry of Heavy Industries.
- Group on industrial activities: industrial action plan implementation : *thematic Ministry*- Ministry of Commerce & Industry (Department of Industrial Policy & Promotion).
- Group on traffic management – use of IT in traffic management, guidelines for minimizing/synchronization traffic signals, providing adequate parking, parking fee structure, etc. : *thematic Ministry*- Ministry of Home Affairs.
- Group on construction activities – prepare and supervise implementation of guidelines on cleaner construction projects : *thematic Ministry* - Ministry of Urban Development.
- In case of six cities, respective State Governments have been requested to set up local Implementation Committee comprising various stakeholders viz. municipal corporation, development authorities, RTO, SPCB, etc. to oversee implementation of city-specific action plans. Wherever such Committees or Authorities are functional, the study findings could supplement their efforts. The local Committees may also address

biomass. garbage/refuse burning and other city-specific sources.

### Emissions Trading Scheme

- India's rapid growth over the last several decades has brought millions of people out of poverty but also increased strain on the environment. The challenge for Government and the private sector is to improve environmental quality without harming output and employment, as the same economic activities that cause pollution – including transport, power generation and industry – have been the engines of growth.
- Emission of particulate matter (PM) which accounts for PM<sub>10</sub> and PM<sub>2.5</sub> in ambient air presents a particularly severe challenge for meeting NAAQS standards in India today. The concentration of particulate matter in Tamil Nadu, Maharashtra and Gujarat is higher than the norms prescribed in NAAQS-2009.
- It is felt that the market based approaches to control environmental quality have the potential to deliver desired environmental outcomes at the lowest social cost. This increases the ability of all stakeholders to participate and comply and improves regulatory effectiveness. The Ministry of Environment and Forests in association with the Central Pollution Control Board(CPCB) and the State Pollution Control Boards (SPCBs) of Gujarat, Maharashtra and Tamilnadu, has initiated a large scale pilot programme to design a particulate emissions trading regulatory regime for industry. The proposed Market Based Emissions Trading Scheme will set a new model for environmental regulation in India.

### Development of Environmental Standards

- Environmental Standards refer both to the acceptable levels of specified

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environmental quality parameters at different categories of locations, i.e., ambient standards for air, noise and water quality criteria as well as permissible levels of discharge of specified waste streams by different classes of activities, i.e., effluent standards and discharges of gaseous pollutants, i.e., emission standards.

- Environmental standards cannot be universal, and each country should set standards in terms of its national priorities, policy objectives, and resources, as stated in the National Environmental Policy, 2006. These standards, may, of course, vary (in general, become more stringent) as a country develops, and has greater access to technologies and financial resources for environmental management. Within the country different States, UTs and local bodies may adopt stricter standards, based on local considerations.
- In order to abate pollution from various sources, Ministry notifies general as well as industry specific emission and effluent standards for various categories of industries under the Environment (Protection) Rules, 1986 as per procedure specified in the Environmental (Protection) Act, 1986. Based on development of new pollution control technologies and their feasibility, these standards are revisited from time to time and new/ revised ones are notified.
- The Ministry has constituted an Expert Committee (EC) to evolve Environmental Standards and Consequent upon the adoption of the National Environment Policy-2006 (para 5.3 : Environmental Standards, Management Systems, Certification and Indicators), the said Committee has been reconstituted. A Social scientist, Public health expert and Environment economist are now on the committee. Based on the

recommendations of the Committee, the Standards are notified after legal vetting by the Ministry of Law & Justice, Government of India.

- All the notified Standards have been loaded on the website of this Ministry which could be downloaded (Rules & Regulations 'Environment Protection' Acts & Rules 'Environmental Standards'). During the year, Standards in respect of following category of industries have been evolved and are being finalized for notification :
  - Effluent & Emission Standards for Pulp and Paper Industry;
  - Emission Standards for Cement Plants;
  - Emission Standards for Generators (Diesel);
  - Emission Standards and Noise Norms for Generators (LPG & CNG); and
  - Effluent & Emission Standards for Electroplating Industry.

The source specific environmental standards have been notified for following industry/process during the year:

#### **Effluent & Emission Standards**

- Copper, Lead or Zinc Smelters
- Pesticide Industry
- Grain Processing Industry
- Integrated Iron and Steel Plants
- Electroplating, Anodizing Industry

#### **Effluent Standards**

- Soda Ash Industry

#### **Emission Standards**

- Petrochemicals Industry

#### **Noise Pollution**

- Noise levels have been a matter of concern due to various activities, religious functions, festivals, marriages, processions and related celebrations.

The main sources of noise pollution include industrial activities, use of public address system, construction activities, use of generator sets, pressure horns, fire crackers etc. Keeping in view the increasing trend in noise levels, Ministry has issued various regulations from time to time to control noise pollution in ambient air, at source and at manufacturing stage. To control community noise, Noise Pollution (Regulation and Control) Rules, 2000 were notified in February, 2000 and amended from time to time. The recent amendments to the Noise Rules, 2000 have been published in the official Gazette on 11<sup>th</sup> January, 2010. A bilingual booklet has been brought out on Noise Pollution (Regulation and Control) Rules, 2000 (as amended to date) by incorporating all amendments for creating mass awareness. The CPCB has been advised for revisiting the national ambient noise standards.

- A road map has been drawn by CPCB for national ambient noise monitoring network.
- First phase of National Ambient Noise Monitoring Network has been commissioned in accordance with NEP-2006 during the year, starting from seven cities, namely, Delhi, Lucknow, Bengaluru, Kolkata, Hyderabad, Chennai and Mumbai by establishing 70 stations to monitor ambient noise on 24 X 7 basis. Monitoring data is available on the website of respective State Pollution Control Board and CPCB.

#### **Charter on Corporate Responsibility for Environmental Protection (CREP)**

- Adoption of pollution control technologies could be successfully achieved through a coordinated approach in which industrial organizations and the regulatory bodies should work in tandem,

to this end, it will be desirable to build up a consortium of concerned organizations and establish partnership for pollution control. With this in view, a series of industry wise inter-action meetings were organized to evolve a road map culminating to Charter on Corporate Responsibility for Environmental Protection (CREP) in 2002-03.

- CREP is a commitment for protection of environment for partnership and participatory action of the stakeholders i.e. industry, their associations and regulatory agencies. Also, it is a road map for progressive improvement in environmental management systems. The Charter has set targets concerning conservation of water, energy, recovery of chemicals, reduction in pollution, elimination of toxic pollutants, process & management of residues that are required to be disposed off in an environmentally sound manner. The Charter enlists the action points for pollution control in following 17 categories of highly polluting industries : Aluminium, Cement, Chlor-Alkali, Copper Smelter, Distilleries, Dyes & Dye Intermediates, Fertilizer, Integrated Iron & Steel, Oil Refineries, Pesticides, Petrochemicals, Pharmaceuticals, Pulp & Paper, Tannery, Thermal Power Plants, and Zinc Smelter.
- For effective implementation of the Charter, eight taskforces comprising experts and members from institutions and industry associations were constituted. Three of them in respect of Thermal Power, Steel Sector and Petroleum Oil Refinery have been reconstituted. These task forces are meeting regularly to monitor and to provide guidance to the industries for adopting necessary pollution abatement measures.

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**Table-22.** The CEPI scores for Critically Polluted Industrial areas/ clusters

SNo.	Industrial Cluster/Area	AIR	WATER	LAND	CEPI
1.	Ankleshwar (Gujarat)	72.00	72.75	75.75	88.50
2.	Vapi (Gujarat)	74.00	74.50	72.00	88.09
3.	Ghaziabad (Uttar Pradesh)	68.50	75.25	71.50	87.37
4.	Chandrapur (Maharashtra)	70.75	67.50	66.50	83.88
5.	Korba (Chhatisgarh)	67.00	57.00	72.50	83.00
6.	Bhiwadi (Rajasthan)	71.00	69.00	59.50	82.91
7.	Angul Talcher (Orissa)	64.00	69.00	65.75	82.09
8.	Vellore (North Arcot) (Tamilnadu)	69.25	65.25	62.50	81.79
9.	Singrauli (Uttar Pradesh)	70.50	64.00	59.50	81.73
10.	Ludhiana (Punjab)	68.00	66.00	64.75	81.66
11.	Nazafgarh drain basin , Delhi	52.13	69.00	65.25	79.54
12.	Noida (Uttar Pradesh)	65.75	64.00	60.00	78.90
13.	Dhanbad (Jharkhand)	64.50	59.00	65.50	78.63
14.	Dombivalli (Maharashtra)	66.00	63.50	57.50	78.41
15.	Kanpur (Uttar Pradesh)	66.00	63.50	56.00	78.09
16.	Cuddalore (Tamilnadu)	54.00	65.25	64.00	77.45
17.	Aurangabad (Maharashtra)	64.75	60.50	59.50	77.44
18.	Faridabad (Haryana)	63.50	59.00	62.75	77.07
19.	Agra (Uttar Pradesh)	59.00	63.75	59.50	76.48
20.	Manali (Tamilnadu)	64.00	59.00	58.00	76.32
21.	Haldia (West Bengal)	53.75	64.50	57.00	75.43
22.	Ahmedabad (Gujarat)	62.75	58.00	58.00	75.28
23.	Jodhpur (Rajasthan)	71.00	69.00	59.50	82.91
24.	Cochin, Greater (Kerala)	57.00	64.00	54.00	75.08
25.	Mandi Gobind Garh (Punjab)	62.00	55.50	62.00	75.08
26.	Howrah (West Bengal)	57.00	54.50	63.50	74.84
27.	Vatva (Gujarat)	60.00	62.00	56.00	74.77
28.	Ib Valley (Orissa)	61.00	56.50	59.00	74.00
29.	Varansi-Mirzapur (Uttar Pradesh)	58.00	62.00	53.50	73.79
30.	Navi Mumbai (Maharashtra)	61.00	59.00	55.50	73.77
31.	Pali (Rajasthan)	52.00	64.00	52.00	73.73
32.	Mangalore (Karnataka)	61.75	57.75	54.00	73.68
33.	Jharsuguda (Orissa)	61.00	56.50	56.00	73.34
34.	Coimbatore (Tamil Nadu)	62.25	58.75	45.50	72.38
35.	Bhadravati (Karnataka)	62.75	56.50	45.50	72.33
36.	Tarapur (Maharashtra)	60.75	56.00	51.25	72.01
37.	Panipat (Haryana)	55.75	56.50	59.00	71.91
38.	Indore (Madhya Pradesh)	59.00	57.50	52.00	71.26
39.	Bhavnagar (Gujarat)	54.50	57.50	57.75	70.99
40.	Vishakhapatnam (Andhra Pradesh)	57.00	57.50	55.00	70.82
41.	Junagarh (Gujarat)	53.25	52.50	59.50	70.82
42.	Asansole (West Bengal)	58.38	56.25	50.50	70.20
43.	Patancheru- -Bollaram (Andhra Pradesh)	50.00	59.00	54.00	70.07

### Critically Polluted Industrial Clusters/ Areas

The Ministry of Environment & Forest (MoEF) has adopted a Comprehensive Environmental Pollution Index (CEPI) system of environmental assessment of the 88 prominent Industrial Clusters, evolved by the Central Pollution Control Board (CPCB) in collaboration with the Indian Institute of Technology (IIT), Delhi. CEPI, a rational number to characterize the environmental quality at a given location following the algorithm of Source, Pathway and Receptor and aggregated CEPI, indicates severe adverse effects on environment and also is an indication of large percentage of population

experiencing health hazards. On the CEPI scale, 43 such industrial clusters, having CEPI greater than 70 on a scale of 0 to 100, have been identified as critically polluted based on the parameters related to incidence of pollution in water, land (ground water) and air. List of the critically polluted industrial areas/ clusters is given at Table-22.

Based on the identification of industrial clusters / areas by the CPCB as critically or severely polluted, Ministry of Environment & Forests vide Office Memorandum dated 13<sup>th</sup> January, 2010 have imposed a temporary restriction for a period of eight months up to August, 2010, on consideration of developmental projects for environmental

**Table-23.** List of Critically Polluted Industrial clusters where moratorium has been lifted

State	No. of clusters	Industrial clusters / areas	Date of lifting Moratorium
Andhra Pradesh	1	Patancheru-Bollaram	26.10.10
Gujarat	3	Vapi Bhavnagar Junagarh	26.10.10 15.02.11 31.03.11
Haryana	2	Faridabad Panipat	31.03.11 31.03.11
Karnataka	2	Bhadravati Mangalore	23.05.11 23.05.11
Kerala	1	Greater Kochi	23.05.11
Madhya Pradesh	1	Indore	31.03.11
Maharashtra	4	Tarapur Dombivalli Aurangabad Navi Mumbai	26.10.10 15.02.11 15.02.11 15.02.11
Orissa	2	Angul-Talchar Ib Valley, Jharsuguda	31.03.11 05.07.11
Punjab	2	Mandi Gobind Garh Ludhiana	26.10.10 15.02.11
Tamil Nadu	2	Coimbatore Cuddalore	26.10.10 15.02.11
Uttar Pradesh	5	Agra Varanasi-Mirzapur Ghaziabad Noida Singrauli	15.02.11 15.02.11 31.03.11 31.03.11 05.07.11

clearance under EIA Notification, 2006 in 43 critically polluted clusters. During this period, the CPCB along with the respective State Pollution Control Boards / UT Pollution Control Committees were required to finalize a time bound action plan for improving the environmental quality in these identified industrial clusters / areas. The moratorium has subsequently been extended up to 31<sup>st</sup> March, 2012. While extending this, the moratorium has been lifted in twenty five areas / industrial clusters, whose action plans have been finalized by CPCB. The State-wise list of critically polluted areas where moratorium has been lifted is given at Table-23.

The CPCB has done second round of environmental assessment of CPAs on the basis of monitoring carried out by Third Party during Feb.,- March, 2011, this showed a mix picture of CEPIs score. This highlight issues of management of CPAs for proactive approach.

#### **Recognition of Environmental Laboratories under Environment (Protection) Act (EPA), 1986**

- The successful implementation of environmental protection programmes essentially requires identifying and quantifying the pollution sources and pollutants, conducting baseline survey, laying down standards and build-up monitoring systems. To meet these requirements, an environmental laboratory requires to be provided with all the necessary instruments and equipments as also expertise and capability of its staff for monitoring all groups of parameters including water, air, noise, hazardous waste, soil, sludge etc.
- For effective implementation of environmental protection programmes there is an inescapable need for an efficient and reliable institutional

arrangement and facilities for survey, identification, quantification and systems for monitoring. In this context, the role of an environmental laboratory assumes paramount importance and significance, especially, for the assessment of the status of environment and its components and can facilitate effectively in prevention and control of pollution. The Ministry has been implementing a programme for recognition of environmental laboratories with the aim of increasing facilities for analysis of environmental samples.

#### **Revision and implementation of Guidelines for Evaluation and Recognition of Environmental Laboratories under E(P) Act, 1986**

- The extant guidelines (1994-95) for establishment and recognition of the laboratories have been revised and procedures streamlined. The revision had become necessary as the Environment (Protection) Act, 1986 has been strengthened over the years with the enactments of various rules and notifications there under. Further, Environmental standards have been formulated for various parameters in different industrial sectors. The guidelines for recognition of environmental laboratories under E(P) Act, 1986 have been revised by the Ministry with emphasis laid on quality assurance and quality control aspects. The revised guidelines have been placed on the website of Ministry ([www.envfor.nic.in](http://www.envfor.nic.in)) for wider circulation. The revised guidelines (June 2008) are a definite improvement in the content and the procedures for recognition of the environmental laboratories.
- These revised guidelines, have been made to bring in synergy in requirements between Environmental Acts, viz. the Water (Prevention and Control of

Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986. Under the provisions of Section 12 and 13 of the E (P) A, 1986, the private laboratories are considered by the Ministry for recognition.

- The revised guidelines have been operationalised. The Expert Committee on Labs is meeting once in every month to discuss all the cases of Govt. and Private Section Labs.
- As per the revised guidelines, periodic surveillance of recognized environmental laboratories under E(P) Act, 1986 was also desired to be undertaken to assess the proper functioning, systematic operation and reliability of data generated at the laboratory.
- During the year, 20 private sector Labs were visited for considering recognition under E (P) A, 1986 and for undertaking surveillance of the Labs. Eight Labs were recommended for recognition under E(P) Act, 1986 during the year.
- Procurement of ISO 9001:2008 and OHSAS 18001:2007 have been made mandatory during this year for all laboratories to be considered for recognition under E(P) Act, 1986
- An Orientation Workshop on revised guidelines for recognition of laboratories under E(P) Act, 1986, was organized at CPCB on 8.7.2011. The Zone wise Orientation Workshop has also been initiated.

#### Common Effluent Treatment Plants (CETPs)

- The concept of the Common Effluent Treatment Plants (CETP) arose in order to make a co-operative movement for pollution control. The main objective of the CETPs is to reduce the treatment cost to be borne by an individual member unit to a minimum while protecting the

water environment to a maximum. Wastewater treatment and water conservation are the prime objectives of the CETP. The concept of CETPs was envisaged to treat the effluent emanating from the clusters of compatible small - scale industries. It was also envisaged that burden of various Government authorities working for controlling pollution and monitoring of water pollution could be reduced once the CETPs are implemented and commissioned.

- A Centrally Sponsored Scheme has been undertaken by the Government for enabling the small scale industries (SSI) to set up new and upgrade the existing Common Effluent Treatment Plants (CETP) to cover all the States in the country. A scheme for financial assistance for the CETPs has been formulated as follows:
  - State subsidy - 25% of the total project cost;
  - Central subsidy - 25% of the total project cost;
  - Entrepreneurs contribution - 20% of the total project cost;
  - Loan from financial institutions - 30% of the total project cost. (e.g. IDBI, ICICI or any other nationalized banks, State Industrial Financial Corporation etc.)
- During this year, an allocation of Rs. 2.70 crore in the RE was made for providing financial assistance to the ongoing CETP projects and for new projects. Financial assistance was provided for the ongoing projects of CETPs at Pandesara, Gujarat and Waluj, Maharashtra.
- Fresh appraisal of the scheme of CETPs is underway with the following salient features:
  - For CETPs involving primary/secondary/tertiary treatment, financial assistance would be

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provided by GOI to the tune of 50% of maximum Rs. 1.50 crore/ MLD capacity, subject to a ceiling of Central assistance of Rs. 15 crore per CETP.

- For CETPs involving primary/secondary/tertiary treatment and ZLD treatment, financial assistance would be provided by GOI to the tune of 50% of maximum Rs. 4.50 crore/MLD capacity, subject to a ceiling of Central assistance of Rs. 20 crore per CETP.
- While sanctioning CETPs, the principle of equity should be applied and priority be also given to CETPs proposed in Critically Polluted Areas.
- The modified ratio proposed in respect of Central share: State share: Project Proponent's share is 50: 25:25:. The GOI would release its share in the ratio of 2:1 (Central subsidy: State subsidy) commensurate with the State Government release.

- Primary, secondary and tertiary treatment to be covered.
- Proposals with progressive technologies like Zero Liquid Discharge (ZLD), Membrane filtration may be considered
- Management Board of CETP to be a Special Purpose Vehicle registered under an appropriate statute.
- Performance Guarantee at full design load to be ensured upfront

### Taj Protection Mission

- In pursuance of the Hon'ble Supreme Court's Order, projects for environmental protection of World Heritage Site of Taj Mahal were initiated and funded by the Ministry. The Planning Commission approved Rs. 600 crore on a 50:50 cost sharing basis with the State Government to implement various schemes in the Taj Trapezium Zone for environmental protection of the Taj Mahal. In the first phase during the IX Five Year Plan, 10 projects were approved by the Government and implemented by the State Government of Uttar Pradesh.

- The Ministry has sponsored a post-evaluation study for completed projects through the National Environmental Engineering Research Institute (NEERI), Nagpur for ascertaining the improvement in environmental status of the area. The final report on the "Environmental Post Evaluation of the projects under the Taj Trapezium Zone" submitted by NEERI, Nagpur has been



Fig-40. Aeration process in Sewage Treatment Plant

accepted by the Ministry. The present environmental condition vis-à-vis Environmental Management Plan (EMP) for the area as suggested in the report has been found useful for initiation of future activities in TTZ.

- At present, only a token of Rs. one lakh is available under the scheme.
- Subsequent to the acceptance by the Ministry of the Post Evaluation Report of the TTZ projects and in order to revive the scheme of TTZ, the U.P. Govt. has been intimated to formulate fresh proposals related to the strengthening of solid waste management, water management, electricity supply and distribution, road connectivity, greening and other activities which have a bearing on the environment in the TTZ area, in line with the EMP suggested by NEERI, Nagpur.
- After fresh proposals are submitted by the Govt. of U.P, provision for more funds during the XII FYP would be taken up with the Planning Commission. Till date no comprehensive proposal has been received from the Government of U. P.

### Environmental Authorities

#### Environment Pollution (Prevention Control) Authority for the National Capital Region

- The Environment Pollution (Prevention and Control) Authority (EPCA) for National Capital Region was constituted under sub-section (3) of Section 3 of the Environment Protection Act, 1986 on 29<sup>th</sup> January, 1998 vide S.O. No. 93(E) dated January 29, 1998 under the Chairmanship of Sh. Bhure Lal. The tenure of the EPCA was extended from time to time, and at present extended upto 28<sup>th</sup> January, 2013.
- The issues considered by the Authority include environment related matters

covering vehicular pollution control, sewage treatment and assessment of operations and handing over of Common Effluent Treatment Plants (CETPs) in NCR to the concerned societies, monitoring of action plans for improvement of air quality in seven metro cities etc. and in addition, the matters referred to it by Hon'ble Supreme Court in its various Judgments.

- EPCA is reporting the compliance status and special tasks assigned to it to the Hon'ble Supreme Court from time to time.

#### Loss of Ecology (Prevention and payments of Compensation) Authority for the State of Tamil Nadu.

- In compliance with the Hon'ble Supreme Court's order dated August 28, 1998 in Writ Petition (Civil) No. 914 of 1991 viz. Vellore Citizen's Welfare Forum versus Union of India and Others, the Ministry constituted the Loss of Ecology (Prevention and Payments of Compensation) Authority for the State of Tamil Nadu under the Chairmanship of a retired Judge of Madras High Court vide notification SO 671 (E) dated September 30, 1996, to deal with the situation created by the tanneries and other pollution industries in Tamil Nadu. The tenure of the authority has been extended until further orders in compliance with the Hon'ble Supreme Court's order dated 28<sup>th</sup> February, 2011.

#### Central Pollution Control Board (CPCB)

##### Introduction

The Central Pollution Control Board (CPCB) performs functions as laid down under the Water (Prevention & Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981. It is responsible for planning and executing comprehensive nation-wide programmes for the prevention and

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control of water and air pollution, for advising the Central Government on matters concerning prevention and control of water and air pollution and for coordinating activities of State Pollution Control Boards/ Pollution Control Committees besides providing technical assistance & guidance to them.

The Central Pollution Control Board has been playing a vital role in abatement and control of pollution in the country by generating environmental quality data, providing scientific information, rendering technical inputs for formulating national policies and programmes, training and development of manpower and organizing activities for promoting awareness at different levels of the Government and public at large.

The Central Pollution Control Board also co-ordinates enforcement and implementation of Rules framed under the Environmental (Protection) Act, 1986 with State Pollution Control Boards/Pollution Control Committees. It also provides support to various committees and authorities constituted by the Government of India such as The Environmental Pollution (Prevention and Control) Authority for the National Capital Region.

### CPCB's Activities

- Coordinating activities of State Pollution Control Boards/Pollution Control Committees for prevention & control of pollution ;
- Development of industry specific national minimal effluent and emission standards;
- Development of industry specific environmental guidelines and comprehensive documents;
- Implementation of CREP recommendations & Compliance of Standards for major polluting industrial sectors were undertaken compliance through Task Forces, the major highlights of sectors are given below :
  - Action plans for improvement of environment in 43 critically polluted

areas/clusters and monitoring their implementation ;

- Action plans for monitoring air quality in 16 polluted cities ;
- National water quality monitoring and publishing annual water quality reports ;
- National ambient air quality monitoring and publishing annual air quality reports ;
- Carrying out and sponsoring research activities relevant to environment protection ;
- Publishing material relevant to environment protection ;

### Achievements during the year

#### Environmental Laboratories Development

Participation in Joint Inspections of Private and Government Laboratories for Consideration of Recognition under The Environment (Protection) Act, 1986

#### Private Sector Laboratories

Central Pollution Control Board has participated in joint inspections with Ministry of Environment & Forests (MoEF) and respective State Pollution Control Boards for recognition of following private environmental laboratories under the Environment (Protection) Act, 1986 during the year 2010-2011:

- M/s Min Mec Enviro. Lab, Delhi
- M/s GRC Laboratory, Noida, U. P.
- M/s Chandigarh Pollution Testing Laboratory, Mohali, Punjab
- M/s Environment Management Quality Center, Mohali, Punjab
- M/s Newcon Consultancy & Laboratories, Ghaziabad, U. P.
- M/s Spectro Analytical Labs Ltd., New Delhi
- M/s Klean Laboratories Ltd., Pune, Maharashtra.

### Government / Public Sector Laboratories

- Regional laboratory – Maharashtra State Pollution Control Board, Nagpur
- Regional laboratory – Maharashtra State Pollution Control Board, Nashik
- Regional laboratory – Maharashtra State Pollution Control Board, Aurangabad
- Central Laboratory – Uttar Pradesh Pollution Control Board, Lucknow, U. P.
- Regional Laboratory – Madhya Pradesh Pollution Control Board, Jabalpur
- Regional Laboratory – Madhya Pradesh Pollution Control Board, Indore

### Participation in Joint Inspections of Govt. / Pvt. Laboratories with Punjab Pollution Control Board for Consideration of Recognition under The Water / Air Act

- M/s ECO Pro Engineers Pvt. Ltd., Ghaziabad, U. P.
- M/s Spectro Analytical Labs Ltd., Delhi
- M/s SGS India Pvt. Ltd., Gurgaon, Haryana
- M/s Haryana Test House, Panipat, Haryana

- M/s International Testing Centre, Panchkula, Haryana
- M/s Punjab Bio-Technology & Incubator, Mohali, Punjab
- M/s Industrial Testing Laboratory, Patiala, Punjab

### Analytical Quality Control (AQC/ Water) for Central and State Pollution Control Boards, Pollution Control Committees and for Laboratories Recognized under the E (P) Act, 1986.

Central Pollution Control Board (CPCB) in association with SPCBs/PCCs maintains vast water quality monitoring network with aim to evaluate the status of water quality bodies. The analysis of quality of data is very important to formulate the policy by the decision maker based on the data generated in the monitoring programmes. To ensure the reliability of the data, Central Pollution Control Board initiated "Analytical Quality Control (AQC)" programme with 20 laboratories during year 1991. In year 2012, number of laboratories participated in this exercise have reached to 202 laboratories of SPCBs/PCCs, the E (P) Act 1986 recognized laboratories. As on 31<sup>st</sup> March 2012, 27 rounds of Analytical Quality Control exercises

were conducted and performance reports were communicated to the participating laboratories. Twenty Physico – Chemical parameters being covered under this scheme.

### Environmental Research Activities

#### Salt-less Preservation of Hides and Skins by Lyophilisation Technique

CPCB undertook an R&D intervention initiative to minimize use of salt in hide preservation in the

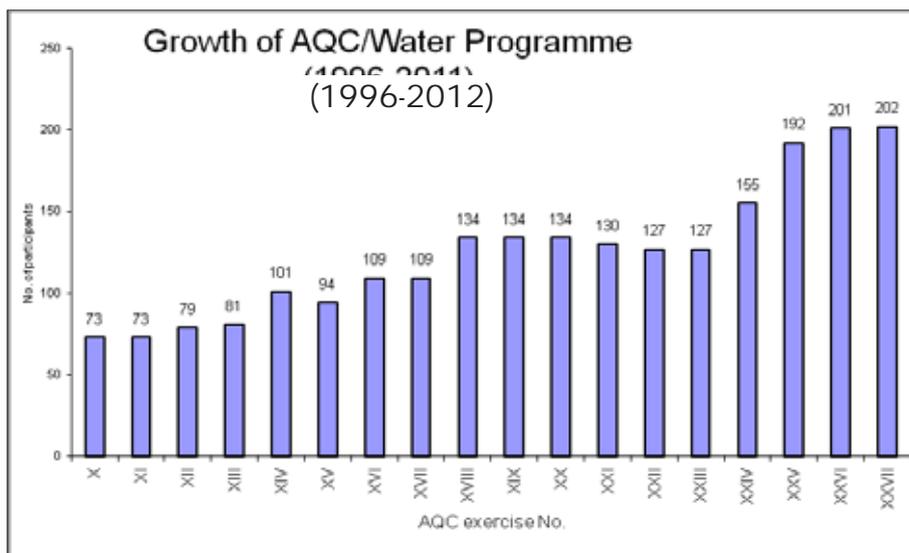


Fig-41. Growth of Analytical Quality Control / Water Programme between Year 1996 – 2012

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tannery sector thereby eliminate the key factor contributing to high dissolved solids in effluent streams from leather processing industries. The process focuses on freeze drying of hides by lyophilization technique. It is based on the principle of sublimation, whereby, water content in the materials to be preserved is first converted into ice and is sublimated to water vapor under vacuum condition, thus extracting the water content and make the lyophilized item freeze dried, stable and easier to store at ambient temperature.

### **Utilization of Distillery Effluent as a Source of Nutrients for Crop production in Different Agro-climatic Regions of India**

CPCB initiated a three year duration network study - "Utilization of Distillery Effluent as a Source of Nutrients for Crop production in Different Agro-climatic Regions of India" - in the year 2007-08 in association with four agricultural institutes/centres - Indian Agricultural Research Institute (IARI) New Delhi (coordinating agency), Tamil Nadu Agricultural University (TNAU) Coimbatore, Mahatma Phule Krishi Vidyapeeth (MPKV) Rahuri and College of Agriculture, Indore. The study has been completed and the combined report is under finalisation.

### **Corrosion Impact Assessment Studies- A report**

Air pollution effects not only people's health and living organisms like plants and animals but also extend to the man-made materials such as metallic and non-metallic materials. These materials are used in the construction of cultural properties, monuments and buildings etc. Air pollution along with meteorological conditions causes the deterioration of these materials that result in the loss of public assets and economic losses.

To investigate the effect of air pollution on different metallic materials, alloys, coated surfaces and non-metallic materials viz. stones, marbles and to mitigate such problems in

future, a study titled "Impact of air pollution on corrosion of metallic and non-metallic materials has been initiated in association with National Metallurgical Laboratory, Jamshedpur. The project studies include the selection of some sites from various parts of the country that shows fluctuations in meteorological conditions, environmental conditions and levels and sources of air pollution. This study would help in the development of corrosion rate.

### **Pilot Plant Study of Water Treatment using Sludge-Reagent-Product (SRP) Technology**

An innovative technology called "Sludge-Reagent-Product (SRP) Technology" was developed by Central Pollution Control Board with an aim to recover the alum in the sludge used for treatment of water. Adoptions of this technology yielded 80 to 90% recovery of chemical coagulant (alum) from discarded alum-treated-sludge for recycling and reuse.

### **Standardization of methodology for determination of Polycyclic Aromatic Hydrocarbon (PAHs) by reversed-phase High-Performance Liquid Chromatography (HPLC)**

Polycyclic Aromatic Hydrocarbons (PAHs) are organic compounds introduced into the environment mainly during the combustion processes, such as burning of fossil fuels. The levels of Polycyclic Aromatic Hydrocarbon (PAH) pollutants are usually low in aqueous samples. High Performance Liquid Chromatography (HPLC) with Ultra-Violet (UV) detector and Florescence Detector are used for PAHs analysis since it provides both high sensitivity and high specificity. National Reference Trace Organics Laboratory of Central Pollution Control Board undertaken a project for standardization of methodology for determination of PAHs by reversed-phase HPLC with Ultra-Violet (UV) Diode Array Detector during the year 2010-11 and

developed protocols for analysis of Polycyclic Aromatic Hydrocarbon using HPLC.

During year 2011-2012, the project "PAH in water and sediments from major drains and Yamuna river in Delhi stretch" has been undertaken with the objectives to determine the concentration levels of PAH in surface water and sediments of the River Yamuna and major drains joining the River within Delhi stretch; to obtain trends in spatial and temporal variation of PAH concentration; to identify possible sources of PAHs input to the River; and to generate baseline data to be used in developing effective remedial measures.

The total PAHs concentration in Yamuna River water and sediments was found  $1.29 - 1.32 \mu\text{g L}^{-1}$  and  $0.78 - 3.10 \text{ mg kg}^{-1}$  respectively and for major drains water and sediments it was between  $1.76 - 9.60 \mu\text{g L}^{-1}$  and  $3.99 - 6.05 \text{ mg kg}^{-1}$  respectively.

#### **Methodology development and standardization for determination of Volatile Organic Compounds (VOCs) by purge & trap pre-concentration followed by Gas Chromatograph-Mass Spectrometer (GC-MS) analysis**

Volatile organic compounds (VOCs) refer to organic chemical compounds which have significant vapor pressures and affect the environment and human health, they are both man-made and naturally occurring chemical compounds. The National Reference Trace Organics Laboratory of Central Pollution Control Board undertook a project during 2010-11 for methodology development and standardization for determination of Volatile Organic Carbons adopting USEPA method 524.2 using Purge and Trap GC-MS.

#### **Project "Assessment of Persistent Organic Pollutants (POPs) residues in human population of Delhi with special reference to adverse health effects and morbidity" (collaborative project with UCMS and GTB Hospital)**

A study has been undertaken by Central Pollution Control Board in collaboration with University College of Medical Sciences (UCMS) as collaborative project during year 2008-09; 2009-10; 2010-11 to generate epidemiological data and establishment of relative risk relationship between the incidence of adverse health outcomes including cancer due to exposure to pesticides with special reference to organo-chlorine Persistent Organic Pollutants residues and Poly-chlorinated Biphenyls.

During the study, 300 blood samples from various age groups of population have been analyzed for organo-chlorine Persistent Organic Pollutants. The higher incidences of presence of Total BHC, Endosulphan, Heptachlor and Total DDT have been found in blood samples from Elderly population (Age group 40-60 years) and Senior citizens (>60 years). Poly-chlorinated Biphenyls was non-traceable in all the blood samples analyzed. High POPs pesticides body burden, increases vulnerability of elderly population to various critical diseases and age related disorders.

#### **National Water Quality Monitoring Programme**

In order to assess the nature and extent of pollution control needed in different water bodies or their part, water quality monitoring is an imperative prerequisite. Central Pollution Control Board in collaboration with State Pollution Control Boards has established a Water Quality Monitoring Network covering 2000 sampling locations located in 27 States and 6 Union Territories covering 383 Rivers, 127 Lakes, 9 Tanks, 59 Ponds, 40 Creeks/Seawater, 17 Canals, 34 Drains and 595 Wells. Water samples are analyzed for 28 parameters consisting of physico-chemical and bacteriological parameters for ambient water samples apart from the field observations. Besides this, nine (9) trace metals and 28

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pesticides are analyzed in selected samples. In view of resource, constraints limited numbers of organic pollution related parameters are chosen for frequent monitoring i.e. monthly or quarterly and major cations, anions, other inorganic ions and micro pollutants (Toxic Metals & POP's) are analyzed once in a year to keep track of water quality over large period of time. The water quality data are reported in Water Quality Status Year Book. The water quality monitoring results obtained between 1995 to 2010 indicated that the organic and bacterial contamination continue to be critical in water bodies, this is mainly due to discharge of untreated domestic wastewater from the urban centres.

### Water quality-monitoring program at the river stretch of Interstate Boundaries

One of the function of the Central Pollution Control Board, under Section 16 2(b) of the Water (Prevention and Control of Pollution) Act, 1974 is to "co-ordinate the activities of the State Boards and resolve disputes among them". In the light of above, CPCB is monitoring the water quality of rivers at the interstate boundaries since 2005. At present, monitoring is carried out four times a year at 82 locations spread over 40 rivers. It was observed that in 26 rivers at 40 locations the water was polluted due to high Bio-Chemical Oxygen Demand (BOD), one of the most important indicator of water quality.

### Water Quality of River Ganga

CPCB is regularly monitoring the water Quality of River Ganga from Allahabad to Tarighat (Gajipur) stretch at 15 locations to assess the performance of STPs (GAP-1) and the impact on river water quality. The main observations were that D.O. in the complete stretch of river Ganga was more

than 4 mg/l (avg.) at all monitored locations showed high bacterial contamination. In West Bengal water quality analysis of river Ganga was undertaken from Farakka to Ganga Sagar. The dissolved oxygen content was uniform throughout the entire length of River Ganga indicating a high re-aeration rate and rapid aerobic oxidation of biological substances.

### Air Quality Network

#### National Ambient Air quality Standards

The National Ambient Air Quality Standards (NAAQS) were notified in the year 1982, duly revised in 1994 based on health criteria and land use based approach. The NAAQS have been revisited and revised in November 2009 in consultation with civil society and experts for 12 pollutants which include SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, Ozone, Lead, Arsenic, Nickel, CO, NH<sub>3</sub>, Benzene, and B(a)P (particulate phase).

#### National Ambient Air Quality Monitoring Programme

The Central Board is executing a nation-wide National Air Quality Monitoring Programme (NAMP) covering 520 operating stations (Fig. 42) spread over covering 215 cities/towns and industrial areas in 26 States and 5 Union Territories. The Table below shows the number of sanctioned and

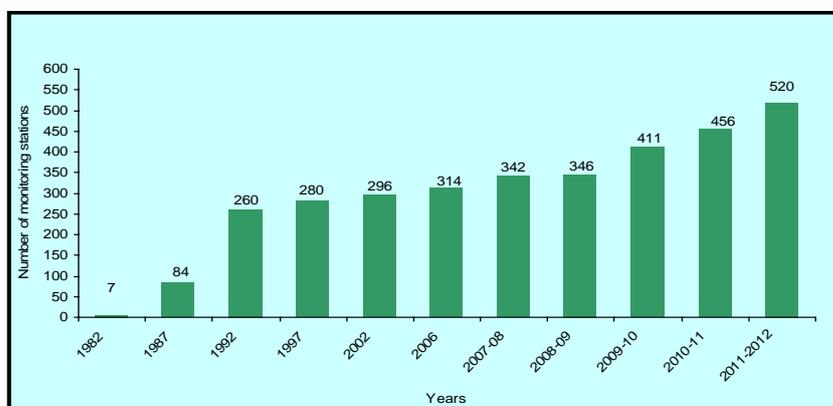


Fig-42. Growth of operating ambient air quality monitoring Network

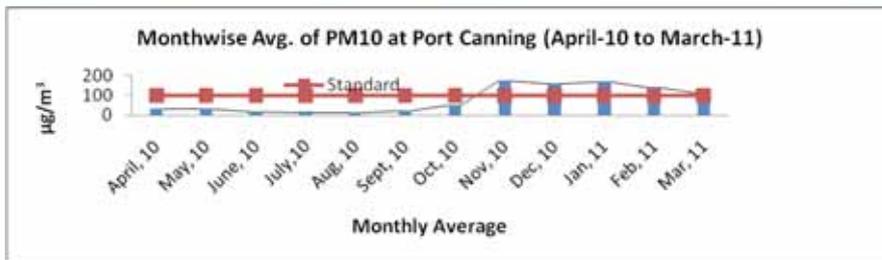


Fig.-43. Monthwise Avg. of PM<sub>10</sub> at Port Canning (April-10 to March-11)

### Ambient air Quality monitoring at International Boundary with Bangladesh at Port Canning, West Bengal

Air Quality Monitoring Station is installed at Port Canning, West Bengal, India

located about 70 km east of Kolkata city, bordering Bangladesh (23 km from Bangladesh border) under Malé Declaration for the study of trans-boundary movement of pollutants.

**Table-24.** Number of metropolitan cities exceeding the NAAQS (Based on annual average data), 2010

Category	Metropolitan cities (population > 10 lacs)		
	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>
Not exceeding NAAQS	35	30	3
Exceeding NAAQS	0	5	31
Total cities	35	35	34

operating air quality monitoring stations till 31<sup>st</sup> March, 2012.

### Ambient Air Quality - Agra

With reference to the Writ Petition (C) No. 13381/1984 M.C. Mehta Vs Union of India and directives by Hon'ble Supreme Court of India in 2000, the CPCB is monitoring Ambient Air Quality at four identified locations in Agra. The data on quarterly basis is being submitted to the Hon'ble Supreme Court and Taj-Trapezium Zone Authority in compliance to the directives. The geographic limits of Taj-Trapezium Zone (TTZ) is in the air pollution sensitive zone trapezoidal shape, covering an area of 10,400 Sq. km The area has been under study since 1982. The overall ambient air quality has improved due to introduction of CNG in the vehicular transport and in several industries.

### Capacity Building Program Under Malé Declaration

Ministry of Environment and Forests & Central Pollution Control Board organized the Regional Stakeholder's Meeting and Inter Governmental Meeting 12 at Delhi during June 27-30, 2011 with a view to review the progress of Malé Declaration, discussions on reviewing the monitoring activities in transboundary air pollution and discussions on the Task Force on Future Development. The program also considers the designing of work program on implementation of the future activities. Delegates from all the eight participating countries attended the program.

### Noise Pollution Control

#### Implementation of Noise (Regulation & Control) Rules

As decided in the 56<sup>th</sup> Conference of Member Secretaries and Chairmen, the working group that was constituted held its 1<sup>st</sup> meeting in Bangalore on 23<sup>rd</sup> February 2011 and as a follow up of first meeting the second meeting was conducted on 18<sup>th</sup> March, 2011. As per recommendation of the committee, the Central Pollution Control Board has written to all the Chief Secretaries of States / Union Territories for demarcation of noise zones and Identification of implementing authority.

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Central Pollution Control Board in association with State Pollution Control Boards has established Real Time National Ambient Noise Monitoring Network in seven metropolitan cities and installed five noise monitoring System each of the following metros viz. Mumbai, Delhi, Kolkata, Chennai, Bangalore, Lucknow and Hyderabad under Phase-I of the programme. The above said network was dedicated to the nation on 23<sup>rd</sup> March, 2011 by Hon'ble Minister of Environment & Forest, Sh. Jairam Ramesh.

### **Noise Pollution Control in IGI Airport, Delhi**

In compliance with the direction of Hon'ble Delhi High Court, Central Pollution Control Board constituted an expert committee on Noise Pollution Control in and around Indira Gandhi International (IGI) airport, Delhi. The expert committee advised CPCB on issues related to noise pollution caused due to aircraft movement in and around IGI airport, some of them are listed below :

- To guide the working group on technical aspects for assessment of the noise problem in the vicinity of Indira Gandhi International (IGI) Airport.
- To develop the methodology including identification of noise monitoring equipments, monitoring location and the number of monitoring stations required for the study
- To propose the noise monitoring network at the IGI airport.
- To evaluate and interpret the data generated from the noise monitoring.

The committee was to engage an expert agency for conducting noise monitoring and noise contour mapping in and around IGI airport, a study proposal including tender document has been prepared for the purpose.

## **Sewage Treatment**

### **In-Situ Treatment of Sewage**

The wastewater management is an important aspect of water pollution. Class-I and Class-II towns in the country generate 38,254 MLD of which the treatment is provided for only 11,787 MLD (31%). The Central Pollution Control Board has taken initiatives for implementation of "In-situ Treatment of sewage" by application of microbial consortia in drains for interim remedial measure. The technology is able to reduce pollution load in terms of BOD, COD & Suspended Solids up to 80% and heavy metals and other chemicals upto 50%.

The demonstrative project on "In-situ treatment of sewage" has been launched at Ramnagar Domora Drain, Bharatpur and A. B. Road Drain Indore. These projects are operational presently. The technology is further proposed to be utilized at four locations under National Ganga River Basin Authority (NGRBA) Scheme at Morigate Nala, Allahabad; Bakarganj Nala, Patna and City Drain Farukhabad and at Budha Nala, Ludhiana under National River Conservation Directorate (NRCD).

### **Performance Monitoring of Sewage Treatment Plant (STPs)**

#### **Monitoring of Sewage Treatment Plants at Allahabad, Mirzapur and Varanasi (Under NRCD project)**

Treated effluent quality from sewage treatment plants installed along the river stretch from Allahabad to Tarighat (Gazipur) is being monitored regularly by Central Pollution Control Board.

#### **STP, Jind (15 MLD)**

15 MLD Sewage Treatment Plant is in operation for treatment of sewage generated from Zone - A, whereas 4.5 MLD plant is

**Table-25.** STP at Allahabad, Mirzapur and Varanasi - An Overview

STP	Place	Type	Capacity (MLD)	Operating Agency	Date of Commissioning
Mirzapur	Mirzapur	UASB	14	U. P. Jal Nigam	31.01.95
Allahabad	Allahabad	ASP	60	U.P. Jal Nigam	June-July1999
Bhagwanpur (BHU)	Varanasi	ASP	8	U.P. Jal Nigam	31.01.90
Dinapur	Varanasi	ASP	80	U.P. Jal Nigam	31.01.95
DLW	Varanasi	ASP	12	DLW	31.01.89
Allahabad	Allahabad	FAB	29	U.P. Jal Nigam	January2008

approved and proposed near Narwana Road for Zone – B.

#### **STP, Rohtak (10 MLD)**

Rohtak is bound by Jind and Sonipat districts on the North, Jhajjar district on the South, Jhajjar and Sonipat district on the East and Hisar and Bhiwani districts in West of Haryana state. The domestic waste is generated from Rohtak city and HUDA Sectors. The domestic waste water generated from HUDA sectors is treated in 10 MLD Sewage Treatment Plant.

#### **STP Bhattian, Ludhiana, Punjab**

The Sewage treatment plant (111 MLD) based on UASB technology was constructed and commissioned in March 2007 by Punjab Water Supply and Sewerage Board, Ludhiana, Punjab under Sutlej Action Plan at Bhattian village, Ludhiana. The other two Sewage treatment plants (STPs) constructed at Ludhiana city are at Jamalpur (48 MLD) and at Balloke 152 MLD.

#### **Status of Sewage Treatment Plants at Jaipur**

##### **STP at Jalmahal (27 MLD)**

The RUIDP Jaipur has constructed 27 MLD STP at Jalmahal, the STP is managed by

Jaipur Municipal Corporation for wastewater treatment from Bramhapuri area.

##### **Tertiary Treatment Plant (TTP) at Jalmahal (7.8 MLD)**

The Tertiary Treatment Plant (7.8 MLD capacity) attached to 27 MLD sewage treatment plant at Jalmahal being managed by Jaipur Development Authority (JDA). The treatment system consist of collection, flash mixture, settling and wetland treatment.

##### **STP Delawas (62.5 MLD)**

At Delawas, there are two STPs of 62.5 MLD capacity each. STP Unit I was commissioned on 15<sup>th</sup> February, 2006 while STP unit II is new and under stabilization. Both the STPs are having similar treatment system comprising coarse & fine screens, grit separators, primary clarifiers, diffused aeration, secondary clarifiers, sludge thickener, centrifuge, sludge digesters and gas holders. The generated gas is being used for power generation to run the blower for supplying air into diffused aeration system.

##### **STP at Jaisingh Khor (50 MLD)**

The STP at Jaisingh Khor village is a newly commissioned sewage treatment plant having 50 MLD capacity. The plant was not fully stabilized and only 50% of the flow was

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being received due to improper drainage system.

### **STP at Shastri Nagar Circle (1.0 MLD)**

The 1.0 MLD Sewage Treatment Plant is located at Shastri Nagar Circle for treating domestic effluents. The treatment system consists of collection, reaction tank-I with media, reaction tank-II with media, tube settler and treated water storage tank.

### **STP at Amberpet Hyderabad (Andhra Pradesh)**

The Sewage Treatment Plant having 339 MLD capacity has been operational since year 2009 at Amberpet, Hyderabad. The STP is provided with facilities of Primary settling tank, Up-Flow Anaerobic Sludge Blanket Reactors (UASB), Facultative Aerated Lagoon and Chlorination.

### **STPs at Bangalore (Karnataka)**

Performance evaluation of two STPs at

Bangalore i.e. Cubbon Park Sewage Treatment Plant and Lalbagh Sewage Treatment Plant were undertaken by Central Pollution Control Board Zonal Office Bangalore during the year.

### **Cubbon Park Sewage Treatment Plant**

Cubbon Park Sewage Treatment Plant (Capacity: 1.5 MLD) is located opposite to Kanteerva Stadium, Bangalore. This is the first sewage treatment plant installed with MBR technology in India and is in operation since August 2005. The plant is sponsored by Bangalore Development Authority. The treated sewage is used for maintaining greenery in the Cubbon Park thus facilitating the park's concept of "green culture" by using recycled water for landscaping.

### **Lalbagh Sewage Treatment Plant**

Lalbagh Sewage Treatment Plant (Capacity: 1.5 MLD) is located in Bangalore is in operation since August 2004. The plant is operated by Bangalore Water Supply Sewerage Board. The

**Table-26.** Sewage Treatment Plants at Jaipur

S. No.	STP	Treatment Technology	Capacity MLD	Actual flow in MLD	Source	Disposal	Compliance status
1.	STP at Jalmahal	ASP	27	40	Domestic & industrial	Disposed in to Jalmahal	Complying
2.	TTP at Jalmahal	TPP followed by wetland system	7.8	7.8	Outlet of Jalmahal STP		Complying
3.	STP at Shastri Nagar Circle	UASB (floating media)	1.0	1.0	Domestic	Plantation and drain	Not complying
4.	STP at Delawas-I	ASP followed by sludge digester	62.5	62.5	Domestic & industrial	Nallah	Partially complying
5.	STP at Delawas-II		62.5	62.5		Nallah	Under stabilization
6.	Jaisingh Khor		50	25	Domestic	Nallah	Under stabilization

STP comprises of wet well, Primary treatment units viz. fine screen channel, grit chamber followed by activated sludge process, clarifier and tertiary treatment system viz chemical dosage tank, flocculation tank followed by final clarifier, chlorination dosing chamber, treated effluent storage tank, centrifuge and sludge drying beds. The treated effluents are carried to Lalbagh garden through HDPE pipes and used for gardening purpose.



Fig-44. Sewage Treatment Plant (STP)

### Other Issues

### Source Apportionment Studies

Particulate matter concentrations in ambient air at several towns and cities in the country is a major non-attainment air quality parameter. Air quality improvement efforts in these areas may require comprehensive science based approach involving

- Identification of emission sources;
- Assessment of extent of contribution of these sources;
- Prioritizing the sources that need to be tackled;
- Evaluation of various options for controlling the sources with regard to feasibility and economic viability and
- Formulation and implementation of appropriate action plans.

In view of this and as follow-up to the Auto Fuel Policy Report, 2003, the Air Quality Monitoring, Emission Inventory and Source Apportionment Studies have been taken up by Central Pollution Control Board in Six cities viz. Bangalore, Chennai, Delhi, Kanpur, Mumbai and Pune with support of premier Research Institutes like Automotive Research Association of India (ARAI); IITs of Chennai, Kanpur and Mumbai; CSIR- NEERI and The Energy Research Institute (TERI). The study focussed on apportionment of fine

particulates ( $PM_{10}$  &  $PM_{2.5}$ ), being one of the most critical air pollutants. A National Summary report has been prepared, which was reviewed by Steering & Technical Committees and also Peer Reviewed by International Experts. The Report was approved by the Govt. in December 2010.

### Implementation of Corporate Responsibility for Environment Protection (CREP)

Implementation of CREP recommendations & Compliance of Standards for major polluting industrial sectors were undertaken compliance through Task Forces , the major highlights of the concerned sectors are given below :

- **Refineries & petrochemicals** : 3<sup>rd</sup> Task Force on Oil Refineries was held on 30<sup>th</sup> September, 2011, the following tasks with time schedules recommended for implementation of CREP recommendations and implementation of standards is briefed below:
  - Possibilities of co-processing of oily sludge in Cement Kilns & Power Plants should be explored and time targets specified for the same - January 2012

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- Details of major shutdowns taken during last five years with task carried out during these periods for compliance of CREP recommendations and implementation of new standards - January 2012
  - Compile data on particulate matter emitted, wherein the fuel (fuel gas and fuel oil) issued, to assess the factor effecting achievability of emission norms - March 2012
  - To sell pet coke only to those units having valid consent under Air Act and equipped with proper air pollution control devices - January, 2012
  - Report on Risks involved in covering effluent treatment facilities with VOC removal system and measures proposed for fool proof safety system will be prepared by HPCL Refinery - January, 2012
  - Upload the environmental status details envisaging effluent characteristics, source emission data, ambient air quality and solid/ hazardous waste generated, stored & disposed on the websites for public information - January, 2012
  - Brief note on report of Leak Detection And Repair (LDAR) to assess the total losses along with steps taken to reduce the losses will be submitted by all units - January 2012
  - All the refineries will provide the real time data on ambient air and source emissions to CPCB. The units will monitor all the notified parameters for compliance verification - January 2012
  - The refineries will strengthen the infrastructure facilities for monitoring of all the parameters as per notified standards with respect to effluent, ambient air quality and emissions - April 2012
  - The refineries will submit a detailed report on the adequacy of process and effluent treatment facilities - March 2012
  - The units should submit the details on management of oily sludge, tank bottom sludge management. The new tankers, whenever inducted into service be provided with bottom loading facilities - March 2012
- Respective SPCBs to instruct the refineries in their areas to submit detailed report on the capacity addition, modifications carried out with respect to process and effluent treatment facilities and adequacy of the ETP facilities.
- **Power plants :** The third meeting of the Task Force on Thermal Power plants for implementation of CREP recommendations was held on 08<sup>th</sup> November, 2011. Following are the recommendations for immediate compliance by all the concerned.
    - All non compliant power plants shall submit the compliance status of directions within 30 days along with a bar chart for implementation of Action Plan for achieving the environmental norms in a time bound manner.
    - Thermal Power Plants who do not currently have in place the Ash Water Recirculation Systems (AWRS) should plan for the same immediately and submit a time bound Action Plan.
    - DVC, in respect of all their older plants, shall provide AWRS and dry fly ash collection systems.
    - UPRVUNL shall submit a time bound action plan along with a Bar Chart for all its activities being taken and achievements for improvement of environmental conditions including

- flyash utilisation by December, 2012.
- APGENCO's Power Plants shall provide with an online AAQ monitoring stations and stack emission monitors by July 2012 and all stations connected to CPCB / SPCB Server.
- All power plants shall submit Action Plan to achieve 100 % flyash utilisation as per 03 November, 2009 Notification.
- NTPC to take urgent initiatives on co-processing of wastes in respect of their thermal power plants.
- Standards should be developed for the parameters SO<sub>2</sub> & NO<sub>x</sub> for the plants using imported coal/pet coke. A meeting in this regard should be organised by CPCB soon.
- Backfilling of mines (open cast) may be permitted on a case to case basis only after CPCB / concerned SPCB is satisfied that proper compaction and studies for soil stability, leaching impact including toxicity and radiological impact study have been carried out in each case.
- Integrated/ joint studies for Environmental Impact Assessment need to be taken up for the areas like Singrauli, Korba, Talcher, Ratnagiri etc.
- Methodology for assessing bank guarantee needs to be spelt out. CPCB is working on the same and would soon be bringing out suitable guidelines in this regard.
- **Iron & Steel** : National Task Force (NTF) for Iron & Steel has been constituted for the implementation of Environmental standards and improving the environmental performance of the Iron & Steel plants in the country. NTF meetings are held at periodic intervals at various

steel plants located in India. The last NTF meeting was held on 21<sup>st</sup> December, 2011 at CPCB, Delhi.

NTF meeting discussed on compliance status of Integrated Iron & Steel Plant and Sponge Iron Plants, and implementation status w.r.t. CREP action points and technology interventions by the industry.

### Environmental Quality Monitoring in Critically Polluted Areas

Central Pollution Control Board has engaged Third Party agencies, i.e. M/s SGS India Pvt. Ltd. and M/s Vimta Labs for monitoring of air, water and ground water quality in 43 Critically Polluted Areas. The monitoring was conducted in February-March, 2011.

Regarding the effectiveness in improving the environmental quality in critically polluted areas from where the moratorium has been lifted, it is pertinent to mention that some short-term action plans have been implemented / initiated. State Pollution Control Board Boards are also keeping constant vigil over polluting industries and Common facilities / CETPs for their effective operation and maintenance. The long-term action plans are yet to be implemented. The activities pertaining to technological intervention (adoption of cleaner technology / fuel), sewage treatment, municipal solid waste management, vehicular pollution control / traffic diversion, infrastructural development / renewal, hazardous waste management, up-gradation of existing environmental infrastructures etc. are still to be implemented, which play a vital role in improvement of environmental quality and reduction of CEPI scores. Therefore, improvement in total environmental status of the critically polluted areas would be reflected after implementation of long-term action plans.

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### Assessment of CEPI in new Industrial Clusters

The assessment of CEPI is a dynamic process and based on the annual average data bank CEPI may be calculated regularly so that the impact and effect of enforcement could be evaluated in terms of improvement in environmental quality of selected industrial clusters. Therefore, software is being developed by Central Pollution Control Board through M/s DOEACC Society, Chandigarh for web-based online calculation of CEPI, which would be shared with SPCBs. The software would enable the concerned SPCBs / PCCs to recalculate the CEPI for their area on regular basis to ensure better enforcement and compliance. The SPCBs / PCC would be capable in regular evaluation of CEPI for the major industrial clusters falling under their jurisdiction to keep constant vigil and prevent further environmental degradation.

### CETP for industrial clusters

The concept of Common Effluent Treatment Plant (CETP) was developed to achieve end-of-pipe treatment of combined wastewater generated by clusters at lower unit cost than could be achieved by individual industries and to facilitate discharge, monitoring and enforcement by regulatory agencies to ensure regular satisfactory operation. The Ministry of Environment & Forests, Govt. of India (MoEF) introduced a financial support scheme (CETP Scheme) since 1994 to ensure their growth in an environmentally compatible manner.

In order to assess the actual unmet need for common effluent treatment plants (CETPs) in the country, the inventorisation of all industrial clusters was proposed to be done by SPCBs/PCCs. The study would cover the following objectives:

- State wise documentation of general information on all industrial clusters in the country.

- Collecting basic information about effluent generation, treatment and disposal and requirement/feasibility for CETP in respect of all clusters.
- Assessment of unmet need for common effluent treatment plants in the country.

### Formulation of Guidelines for Idol Immersion

To curb the pollution problem in river / water bodies due to Immersion of Idols, the Central Pollution Control Board has laid down "Guidelines for Idol Immersion", which has been published under Programme Objective Series: PROBES/136/2010 and also available on CPCB's Website ([www.cpcb.nic.in](http://www.cpcb.nic.in)) The Guidelines has been forwarded to each State Government for necessary action at their end.

### Municipal Solid Wastes

#### Municipal Solid Waste Management Demonstration Projects

Ministry of Environment & Forests and Central Pollution Control Board have instituted a scheme for setting up of demonstration project on municipal solid waste management in accordance with Municipal Solid Waste Management (MSW) Rules. The objective of the scheme is to demonstrate implementation of MSW Rules in an integrated manner. The scheme is based on cost sharing basis, where concerned local body is required to contribute 50% of total cost of the project. The status of demonstration projects undertaken at selected towns is given in Table-27.

### Hazardous Wastes Management

#### Co-Processing of HW

The Hazardous Wastes (Management, Handling & Trans-boundary Movement) Rules, 2008, provided specific section (Rule 11) dedicated to utilization of Hazardous wastes as a supplementary resource or energy recovery or after processing. In view of this,

**Table-27.** Status of demonstration projects undertaken at selected towns

S. No.	State	Towns	Status
1.	West Bengal	North Dum-Dum & New Barrackpore	Completed
2.	UT Chandigarh	Chandigarh	Completed
3.	Tamil Nadu	Udumalpet	Delayed
4.	Kerala	Kozhikode (MoEF)	-
5.	Himachal Pradesh	Mandi	Completed Ph-I
6.	Andhra Pradesh	Suryapet	Completed
7.	Nagaland	Kohima	Delayed
8.	Maharashtra	Jalna	Delayed
9.	Arunachal Pradesh	Itanagar	Withdrawn
10.	Sikkim	South West District	Delayed
11.	Tripura	Agartala	Completed Ph-I
12.	Gujarat	AUDA (MoEF)	-

the Central Pollution Control Board has brought out guidelines on Co-processing of distillery spent wash in Cement/Power/Steel Industry and taken-up trial run for co-processing of few categories of wastes and regular permission for the same is being granted. The potential of incinerable waste generation from the southern states of the country are as follows:

#### **Co-Processing of Wastes in Cement Plant, Thermal Power Plant and Steel Plant - Project Funded by MoEF**

A MoEF funded two years project on "Co-processing of hazardous and other wastes in cement plants, iron & steel plants and thermal power plants' to explore the possibility of co-processing Hazardous waste in environmentally friendly manner as well save coal (the main fuel) in these plants. Twenty five cement plants, six thermal power plants and eight steel plants have been identified for co-processing of thirty different types of wastes.

The permission for Co-processing of various wastes in cement kilns are being

granted by CPCB after successful trial runs. So far, twenty five cement industries are permitted for regular co-processing of Hazardous Wastes, so far 15,53,253 tonnes Hazardous Wastes have been co-processed in cement kilns.

Co-processing of wastes in Thermal power plants is a new initiative. As per international literature, not much work has been done with respect to co-processing of industrial wastes in Thermal Power Plants. Only selected wastes such as biomass, wood residue, Refuse Derived Fuel (RDF), Tires have been tried for co-processing in other countries. Thermal power Plants were pursued to identify the wastes along with quantities available in the vicinity and submit proposals to CPCB for conducting trial-runs. Six plants have shown their interest for co-processing of wastes like ETP sludge (from Paint, Refinery, Petrochemical etc.), RDF, Used / spent oil Sludge, waste oil recycling, Used Resin, Plastic waste, Pet coke, Oil soaked cotton from hydro plants & Spent Pot Lining). However, hazardous wastes like Spent Pot

Lining (SPL) and ETP Sludge from textile industry have been co-processed in thermal power plants as an initiation.

**Co-Processing of Distillery Spent Wash in Thermal Power Plant**

Feasibility for co-processing of spent wash from distillery at Raichur Thermal Power Station, (KTSP) KPCL is being assessed with the experts from SINTEF, Norway. Higher Chloride & moisture content in spent wash is matter of concern.

**Co-Processing of Spent Pot Lining in Thermal Power Plants**

Two trial run studies for co-processing of Spent Pot Lining, a waste from aluminium Plant, have been conducted at CPP of M/s HINDALCO Ltd. located at Renukoot, UP and Hirakud, Orissa.

Central Pollution Control Board proposed, co-incineration of concentrated spent wash in cement kiln as it contains significant calorific value (around 4000 kcal).

Emission from the Kiln state was monitored for various parameters as different cement plants monitoring results are depicted in figure 45, 46 and 47.

**Hazardous Waste Contaminated Sites**

The indiscriminate disposal of hazardous wastes may generate contaminated sites

which pose health and environmental risks to surface & groundwater. An initial list of such contaminated dump sites in the country was prepared by the Supreme Court Monitoring Committee (SCMC) during October 2006 (constituted by the Hon'ble Supreme Court of India in the matter of Writ Petition (Civil) No. 657 of 1995), which reported the presence of 141 sites.

The Central Pollution Control Board (CPCB) has further updated the list of such sites as per preliminary information received

**Table-28.** Incinerable Hazardous Waste Generation in Southern States

State	No. of Units	Quantity MT/A	No. of cement/ TPP/ Steel & Iron units
Andhra Pradesh	1739	31659	23
Karnataka	1028	5486	15
Kerala	23	439	5
Tamilnadu	276	30735	28
Goa	56	21625	Nil
Puducherry	86	25	Nil

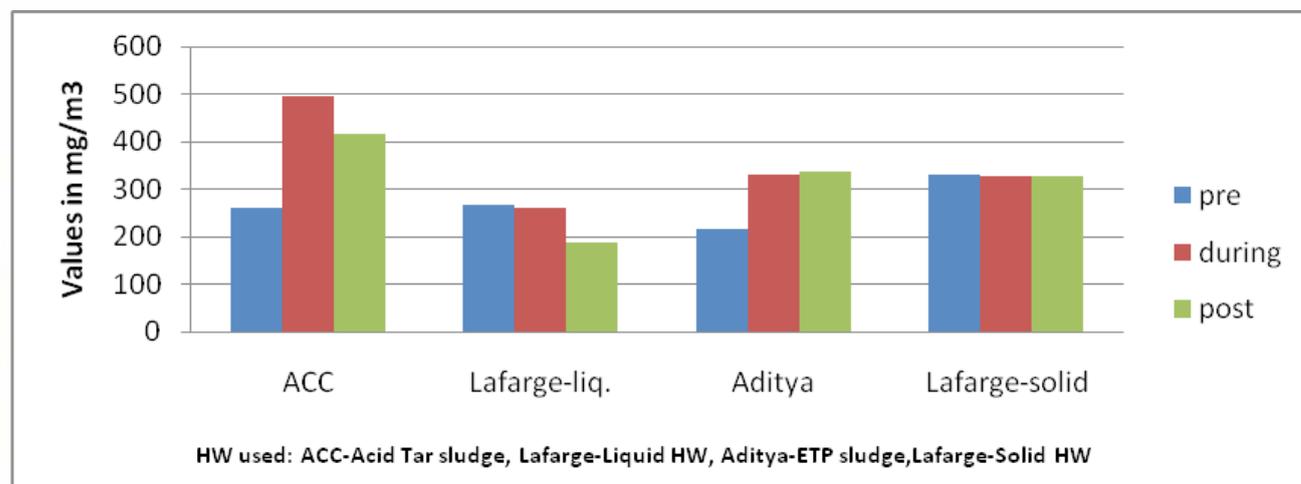


Fig-45. Nitrogen Oxides Concentration in Kiln Stack

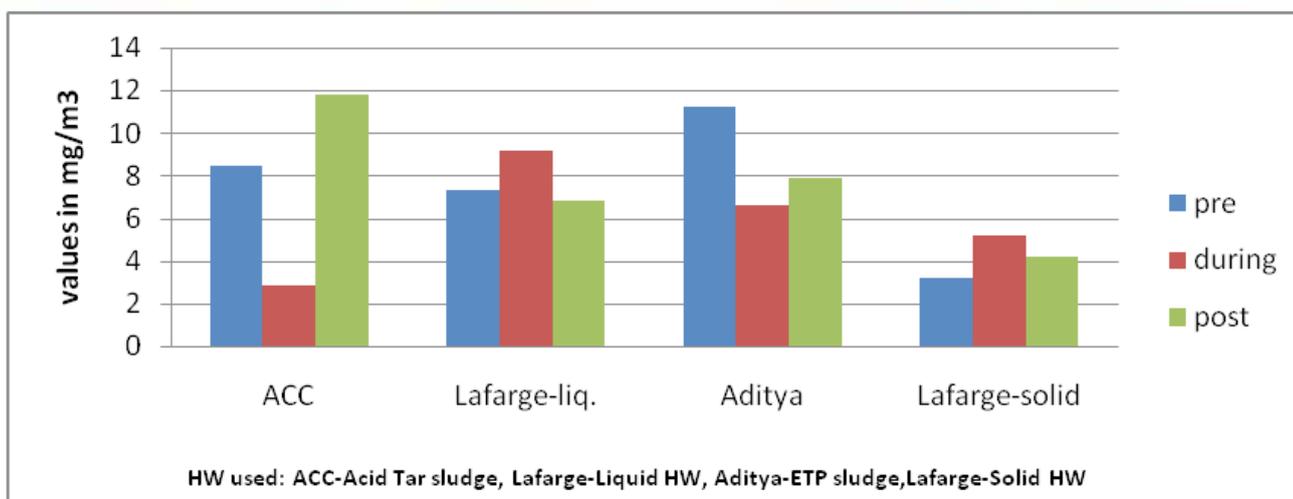


Fig-46. Hydrocarbon (HC) Concentration in Kiln Stack

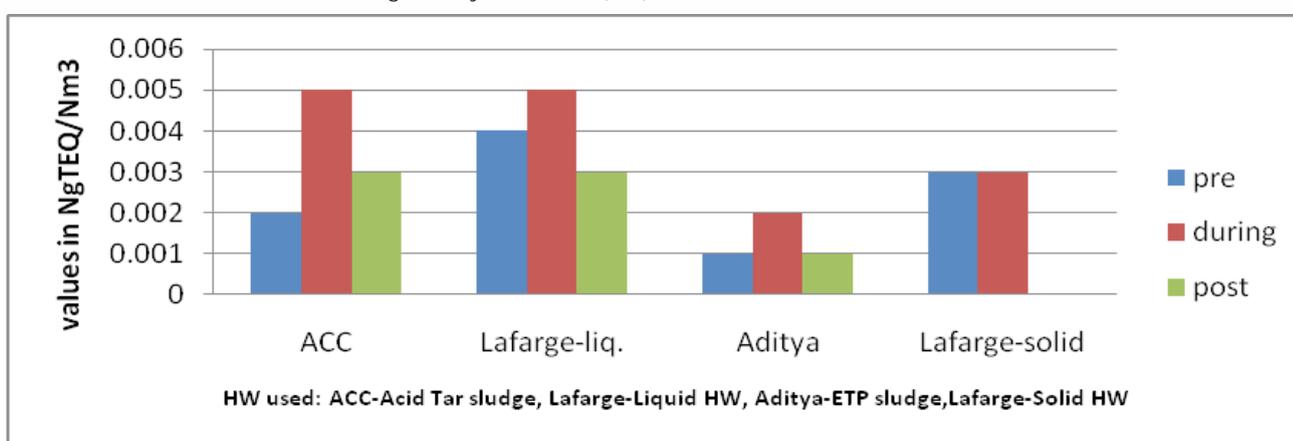


Fig-47. Dioxin & Furan Concentration in Kiln Stack

Table-29. Hazardous Waste Contaminated Dump Sites

State	Contaminated Dump Sites Reported by SCMC	Current Number of Contaminated Dump Sites
Andhra Pradesh	40	-
Assam	5	-
Delhi	-	21
Gujarat	7	2
Karnataka	18	-
Kerala	1	4
Madhya Pradesh	4	4
Maharashtra	10	-
Orissa	21	21
Punjab	14	5
Rajasthan	1	1
Tamil Nadu	2	2
Uttar Pradesh	10	5
West Bengal	8	8
<b>Total</b>	<b>141</b>	<b>73</b>

from State Pollution Control Boards/Pollution Control Committee's (SPCBs/PCCs). Presently there 73 hazardous waste contaminated dump sites. The list is under constant review and contains preliminary information / data on the nature and extent of contamination, which may require further examination. Change in number of sites from the original SCMC list is due to in-appropriate assessment of wastes and containment/shifting of hazardous material to TSDFs by SPCBs.

Hazardous waste contaminated dump sites existing in Kerala and Madhya Pradesh were jointly visited by a team comprising officials of Central Pollution Control Board and NGRI to assess present levels of contamination.

### Plastic Waste Management

#### Co-processing of Plastic Wastes in Cement Kiln

Plastic products have become an integral part in our daily life as a basic need. Plastics are produced on a massive scale worldwide and its global production has crossed 150 million tonnes per year. In India, approximately eight Million tonnes of plastic products are used every year (Estimate Year

2008). The Plastics finds broad range of application in films, wrapping materials, shopping and garbage bags, fluid containers, clothing, toys, household and industrial products and building materials. Although, most plastics are recyclable, but recycled products become more hazardous than virgin plastic products. The non-biodegradability of plastic products and unskilled processing of recycled plastics raises several critical environmental issues.

Plastic waste generated from various cities and towns becomes part of municipal solid waste (MSW) in case it is not collected by rag pickers, recyclers etc. It is estimated that approximately 15,342 tonnes/day (TPD) of plastic waste (per capita basis) is generated in the country. To mitigate plastic waste disposal problems, Central Pollution Control Board in association with Madhya Pradesh Pollution Control Board has taken initiative to use plastic waste in Cement plant at ACC, Kymore, Katni, Madhya Pradesh. The stack monitoring result revealed that emission values are found below the standard set for Common Hazardous Waste Incinerators.

### Bio-Medical Waste Management

#### Status on Bio-medical Waste Management in the country

Central Pollution Control Board (CPCB) is regularly pursuing with the State Pollution Control Boards and Pollution Control Committees to get annual report on bio-medical waste management in the respective State / Union Territories. There has been increase in number of common Bio-medical waste treatment facilities over the years and at present there are 185 Central Biomedical Waste Treatment



Fig-48. Plastic waste

**Table-30.** Bio-Medical Waste Management Scenario in the Country

No. of healthcare facilities	129511
No. of No. of beds	1368839
No. of Common Bio-medical Waste Treatment Facilities	185
No. of healthcare facilities (HCFs) using CBWTFs	95410
No. of healthcare facilities applied for authorization	57180
No. of healthcare facilities granted authorization	53813
Quantity of bio-medical waste generated in Tons/day	405.7*
Quantity of bio-medical waste treated in Tons /day	292.0
No. of incinerators (excluding CBWTFs)	
(i) With Air Pollution Control Device	250
(ii) Without Air Pollution Control Device	297
No. of Autoclaves	2569
No. of Microwaves	173
No. of Shredders	4271

Note: \* Above details excluding the bio-medical wastes generated from Sikkim SPCB as well as Bio-medical wastes generated (about 9.25 Tons per day) from Armed Forces Health Care Establishments

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Facilities (CBWTFs) (168 under operation + 17 under construction) to facilitate proper treatment and disposal of bio-medical waste in the Country.

The State / Union Territory-wise Health Care Facilities (HCFs) applied for authorization & granted authorization by respective State Pollution Control Boards / Pollution Control Committees is presented in Fig-49.

**Evaluation of Proposed State-of-Art Treatment Technologies for Safe disposal of Bio-Medical Waste**

Central Pollution Control Board Organized 10<sup>th</sup> Expert Committee Meeting on 1<sup>st</sup> September, 2010 wherein three new State-of-Art Treatment Technologies for safe disposal of Bio Medical Waste were considered:

- M/s Trade International for the Technology “PIWS 3000 (Static / Mobile)” Submitted

- vide letter No. Nil dated April 13, 2010
- M/s AGA Process Solutions for “Microwave Disinfection System” Submitted vide letter No. Nil dated April 28, 2010;
- “Portable dual Mediburn-Medical Bio-Waste Incinerator” Submitted vide letter No. Nil dated May 07, 2010 received from M/s Henna Marine Engineering DMCC, Vile Parle (E), Mumbai, Maharashtra

The feasibility reports are under evaluation.

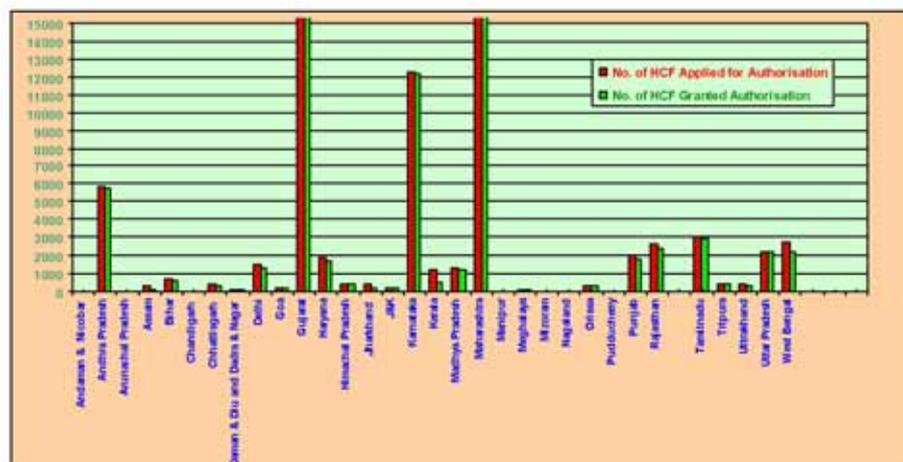


Fig-49. State / UT-wise Health Care Facilities applied for Authorization and Numbers Granted Authorization

### **Management of E-Waste**

The Central Pollution Control Board has been actively involved in drafting of e-Waste (Management and Handling) Rules and contributed significantly. The draft rules were notified vide Govt. of India Gazette Notification S.O.1125 (E), dated 14<sup>th</sup> May, 2010 inviting objections and suggestions from all persons likely to be affected. The major highlights of these rules are that the producers have been given the responsibility for collection of e-Waste generated from the end of life of their products, in line with the principle of Extended Producer Responsibility, to ensure that such e-Waste are channelized to registered dismantlers or recyclers. The producer will also ensure collection and channelization through their authorized collection agencies

### **Development of Environmental Standards**

#### **Effluent Standards for Soda Ash Industry**

The studies were conducted at four locations viz. Mithapur, Porbandar, Sutrapada and Bhavnagar where various soda ash manufacturing units viz. Tata Chemicals Ltd, Saurashtra Chemicals Ltd, Gujarat Heavy Chemical Ltd and Nirma Ltd, respectively release their effluents. The study was undertaken in association with National Institute of Oceanography (NIO), Goa. The revised effluent standard are under notification.

#### **Review of Emission Standards and Preparation of Comprehensive Industry Document (COINDS) on Manmade Fibre Industry**

The objectives of study include review of existing effluent standards for Rayon and Nylon Industry. The study was initiated in

association with NEERI Nagpur. The dry study has been completed, while in-depth study is in progress.

#### **Harmonization of Environmental Standards for Pesticide Industry**

Effluent and Emission standards for pesticide industry were notified notified at Sl. No 40, 71 & 101 in Schedule I, the same were reviewed during sixth meeting held on 13<sup>th</sup> January 2011 of Reconstituted Expert Committee. The Environmental Standards have been harmonized and recommended to bring under single Sl. No. 40.

#### **Implementation of New Environmental Standards and Mass Based Standards for Petroleum Oil Refineries**

To discuss the issues and compilation on status of implementation of revised effluent and emission standards for oil refineries notified under the Environment (Protection) Act, 1986. An Interaction meeting with representatives of various Oil Refineries was held on 22<sup>nd</sup> January, 2011 at Central Pollution Control Board, Delhi

#### **Environmental Standards for Iron Ore Mining & Ore Processing**

Emission and effluent standards for Iron Ore Mining and ore processing has been notified on 04<sup>th</sup> October, 2010.

#### **Environmental Standards for Sintering Plant in Steel Industry**

The project has been initiated with objective to assess cleaner technologies for sintering plant of Steel Plants for better environment management improving production and energy efficiency. The project also aims at developing of new PM emissions standards for sintering plants to replace old standards of 150 mg/Nm<sup>3</sup>.

#### **Harmonization of SO<sub>2</sub> Emission Standards from Sulphuric Acid Plant of Smelter and Fertilizer Plant**

The emission standard for Sulphur Dioxide (SO<sub>2</sub>) in Sulphuric Acid plant of Smelter has been harmonized with that of Fertilizer plant. The amended standards have been notified.

### **Environmental Standards for Rubber Processing and Rubber Products Industry**

The studies for development of Environmental Standards for Rubber Industry have been undertaken by Central Pollution Control Board based on the study the environmental standards for Rubber Processing and Rubber Products Industry has been notified under the Environment (Protection) Rules, 1986

### **Development of Environmental Standards and Guidelines for Glue & Gelatin Industry**

The study for Development of Environmental Standards and Guidelines for Glue & Gelatin Industries has been completed based on the findings the environmental standards for Glue & Gelatin Industry is being undertaken.

### **Environmental Standards and Good Practice for Automobile Service Stations, Bus Depots and Workshops**

The study for Development of Environmental Standards and Good Practice for Automobile Service Stations, Bus Depots and Workshops has been completed and final report submitted based on the report the environmental standards are under finalization

### **Development of Environmental Standards & guidelines for Plywood Industries**

CPCB has undertaken the study for Development of Environmental Standards & guidelines for Plywood Industries. Monitoring in all Zones of the country has been completed and interim report is under finalisation.

### **Revision of Emission norms for Diesel Engine Genset and Genset driven by Petrol and Kerosene**

In the 12<sup>th</sup> meeting of the "Standing Committee on Emission from RIC engine for off-road applications" the emission norms for diesel kerosene & Petrol operated gensets were taken up for review. The draft notification shall be notified.

### **Generator Set Type Approval and COP certificate for Noise Compliance**

It is mandatory for gensets manufacturers to obtain NOC for Type approval and Noise compliance for which the procedure has been simplified and streamlined.

ARAI, NSTL, FCRI, NAL, ICAT, National Test House have been identified by CPCB as certifying agencies for monitoring and issuance of Type Approval and COP certificate for Noise Compliance and ARAI, VRDE, ICAT for emission compliance. To reduce the workload of the certification agencies and time, it was decided to increase the number of Certificate Agencies and accordingly, ICAT and National Test House (Ghaziabad) have been added to the list of Certification Agencies for Noise Compliance.

### **Mass Awareness**

#### **Paryavaran Darshan Programme on DD National**

Central Pollution Control Board launched a weekly TV program 'Paryavaran Darshan' on 5<sup>th</sup> 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. The twelve languages for telecasting include Hindi, Gujrati, Malayalam, Assamese, Kashmiri, Bengali, Oriya, Marathi, Kannada, Tamil,

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**Table -31.** 'Paryvaran Darshan' Programme on DD National

S. No	DD Regional	Language Kendra
1	DD National	Hindi
2	Ahmadabad (Gujarat)	Gujarati
3	Thiruvananthapuram(Kerala)	Malayalam
4	Bhopal (Madhya Pradesh)	Hindi
5	Shimla (Himachal Pradesh)	Hindi
6	Guwhati (Assam)	Assamese
7	Srinagar (J & K)	Kashmiri
8	Jaipur (Rajasthan)	Hindi
9	Kolkata (West Bengal)	Bengali
10	Bhubaneswar(Orissa)	Oriya
11	Lucknow (Uttar Pradesh)	Hindi
12	Patna (Bihar)	Hindi
13	Mumbai (Maharashtra)	Marathi
14	Bangalore (Karnataka)	Kannada
15	Chennai(Tamil Nadu)	Tamil
16	Hyderabad (Andhra Pradesh)	Telugu
17	Jalandhar (Punjab)	Punjabi
18	Ranchi (Jharkhand)	Hindi
19	Raipur (Chhattisgarh)	Hindi

Telugu, and Punjabi. CPCB for the first time has involved TV as a medium for spreading mass awareness on environmental issues.

## Fly Ash Utilization

### Introduction

Fly ash is the finely divided mineral residue resulting from the combustion of ground powdered coal in electric generating plant. Fly ash consists of inorganic matter present in the coal that has been fused during coal combustion. The fast increasing demand of power coupled with its dependence on coal for at least 2/3rd of its energy requirement is generating large volume of fly ash. The Ministry of Environment and Forests has issued notification and its amendments under the Environment (Protection) Act, 1986 for fly ash utilization. These are as follows:

- Fly Ash utilization Notification S.O. 763(E) of 14<sup>th</sup> September 1999.

- Amended notification S.O. 979 (E) of 27<sup>th</sup> August 2003.
- Amended notification S.O. 2804 (E) of 3<sup>rd</sup> November 2009.

The objectives of these notifications are to protect environment, conserve the top soil, prevent dumping of fly ash from Thermal Power Stations on land and to promote utilization of ash in the manufacture of building materials and construction activity. The implementation of these Notifications has resulted in steady increase in the utilization of fly ash. The 2<sup>nd</sup> Meeting of the of the Monitoring Committee, constituted in pursuance of the provisions contained Fly ash Utilisation Notification, was held on 20<sup>th</sup> December, 2011.

## Environmental Health

The Ministry had initiated environmental epidemiological studies in different areas of indoor and outdoor pollution so as to identify and develop programmes to create data base and suggest environmental mitigation measures. Continued research in health effects of ambient air pollution is necessary to evaluate changing trends and to suggest corrective measures.

## Development and Promotion of Clean Technology

### Introduction and objectives

Clean Technologies, as distinct from "end-of-pipe" abatement technologies minimize the generation of waste streams in the production processes and utilize waste from other consumption goods and production processes, rather than treating the waste after generation. A grant-in-aid Scheme on Development and Promotion of Clean Technologies was initiated in 1994 with the following objectives:-

- Development & Promotion of Cleaner Technologies
- Development of Tools and Techniques for Pollution Prevention

- Formulation of Sustainable Development Strategies

### Activities undertaken and completed

Since the inception of the scheme in 1994, important activities undertaken include;

- Demonstration projects
- Life Cycle Assessment
- Carrying Capacity Studies
- Creation of data base for Clean Technologies
- Training programmes for Adoption of Clean Technologies etc.

### Progress made during the year

Under the scheme progress made are as follows:

- Progress Review Committee meetings were organized at the site to monitor the progress of the projects.
- It has been decided by the Ministry to merge the two schemes on "Development & Promotion of Clean Technology and Industrial Pollution Abatement through Preventive Strategies (Waste Minimisation).
- EFC & Guidelines of the merged scheme "Development & Promotion of Clean Technology and Waste Minimisation Strategies has been finalized.
- A meeting of a group of officers for Evaluation of projects was held on 20th January, 2012 where the following projects were cleared for financial assistance:
  - Demonstration Project of PLASMA Technology for Waste Destruction by M/s Jyoti OM Chemical Research Centre Pvt. Ltd., Ankleshwar.
  - Development and Demonstration of Nano-sized TiO<sub>2</sub>- based Photo catalytic Oxidation Technology for controlling VOCs at Source by IIT, Kanpur.

**Ongoing Projects:** Under the grant-in-aid scheme eleven projects were continued during the period. These are:

- Effective removal of arsenic from ground water at by CSMRI, Gujarat.
- Implementation of LPS Technology by M/s ABC Paper, Punjab.
- Development of Fly Ash Based Geopolymer Concrete Pre-cast Elements by Annamalai University, Tamil Nadu.
- Life Cycle Assessment of Wood and Bamboo Composite Products by IPIRTI, Bangalore.
- Capacity Building of Environmental Officers on Cleaner Production/Technology by FICCI, New Delhi.
- Life Cycle Assessment for construction Industry – concrete by NCCBM, Haryana
- Performance Evaluation the Biodegradation of Absorbable Organic Halides (AOX) from Pulp and Paper Mills by AMU, Aligarh.
- Environment Friendlier Technology in Glass Industry by Winrock International.
- Clean Technology for the recovery of Gold, Silver and other allied materials from E-waste by Mysore University.
- Demonstration of Clean Technology for landfill gas recovery by TERI, New Delhi.
- Creation of Data Base and Evolving a Mechanism for Capacity Building in the financial sector and application of fiscal instrument for clean technology projects, CPCB, Delhi.
- **Life Cycle Assessment** Life Cycle Assessment Studies in Thermal Power Plants, Steel, Pulp and Paper and Cement (from cradle to gate) has been completed. Second phase of the project i.e. gate to grave is continuing during the current financial year.

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- **Carrying Capacity Studies:** Carrying capacity studies of Greater Kochi Region, Doon Valley, Damodar River Basin, Tapi Estuary and National Capital Region (NCR), Natural Resource Accounting Studies for Upper Yamuna Basin; has been completed.
- **Creation of data base for Clean Technologies:** Data Base on the available cleaner technologies in the country as well as in abroad, Evolving a Networking Mechanism of the Research Institutions of the country, Capacity Building in the financial sector and application of fiscal instruments for adoption of clean technologies by the Small Scale Industries are in progress.

#### Brief summary of these completed project are

- Defluoridation of water using natural materials for better drinking water supply in rural regions by JNU, New Delhi.  
Present study is based at finding low cost, environment friendly method for removal of fluoride. The column study reveals that use of the amount of materials according to fluoride removal capacity seems to be very effective.  
A pilot plant has been set-up at Samalpathi Village, Tamil Nadu. The water supplied by the water works deptt. contain fluoride in excess of WHO limit of 1ppm. This technology was used for removal of fluoride from the drinking water proved to be highly effect. The level of original fluoride content was found to be as 3.5 ppm. This has been reduced to 0.9 ppm when passed through the column which was packed with the natural material.
- Demonstration of environmentally sound technology for regenerating/recovery/recycling of paint sludge by NPC, New Delhi.  
Main objective of the study is to compare

advantages and disadvantages of options for managing paint waste, to develop and demonstrate environmentally sound technology for re-processing/recovering/recycling of Paint Sludge from automobile sector. A pilot recycling facility was set up for assessing technical and economic feasibility of converting paint sludge to recycled primer. The paint sludge samples were collected from different large-scale automobile units to undertake research and development work so as to meet their quality criteria. Finally the paint sludge was converted in to a Recycled Primer. The developed product has been given to industries for undertaking quality tests on their own and the same was found to be in line with their requirements.

The current paint sludge regeneration technology under review is aimed at serving dual purpose of efficient resource utilization and environmental management. The various themes which have been addressed through the current technology are – resource conservation, waste minimization, promotion of cleaner production technologies and environmental protection other benefits derived from the adoption of regeneration technology are reduction of Landfill Space, Conserving Natural Resources, Benefits to Waste Generators using Regenerated Paint Sludge etc.

#### Industrial Pollution Abatement through Preventive Strategies (Waste Minimisation for Small & Medium Industries)

##### Introduction and objectives

Main objective of the waste minimization schemes is to optimize the consumption of raw materials and also reduce waste generation by adopting production techniques which are cleaner in nature and can be adopted by the existing units without necessarily changing the production processes or unit operations. The detailed objectives of the scheme are following:

- To assist the primary small scale units and some medium scale units who do not have access to the requisite technical expertise to achieve waste minimization but exclude procurement of equipment and hardware.
- Establishing and running Waste Minimization Circles (WMCs) in clusters of Small & Medium Industries.
- Capacity building in the area of Waste Minimization/Cleaner Production.
- Waste Minimization demonstration studies in selected industrial sectors.
- Preparation of sector specific manuals on waste reduction, reuse and recycling.
- Awareness programs and preparation of compendium of success stories on cleaner production/waste minimization.

#### Activities undertaken and completed

(a) Demonstration projects (b) Establishment of Waste Minimization Circles, (c) Training programmes (d) Organization of workshops/seminars (e) Publications of Newsletters (f) Developing Awareness Material on Waste Minimization.

#### Progress made during the year

- Under the scheme on Abatement through Preventive Strategies (Waste Minimisation) the progress made during the financial year 2011-12 are as follows:
  - Progress Review Committee meetings were organized at the site to monitor the progress of the projects.
  - It has been decided by the Ministry at the high level meeting to merge the two schemes on "Development & Promotion of Clean Technology and Industrial Pollution Abatement through Preventive Strategies (Waste Minimisation).
  - EFC & Guidelines of the merged scheme "Development & Promotion of Clean Technology and Waste

Minimisation Strategies has been finalized.

- A meeting of a group of officers for Evaluation of projects was held on 20<sup>th</sup> January, 2012 where the following projects were cleared for financial assistance:
  - Synthesis of Polymer Nano Hydrogel and Development of Hybrid Waste Water Treatment System Using Cavitation Technique and Hydrogel by Department of Advance Technology, University Pune, Pune.
  - Development of Reactive Thermal Plasma Reactor to Synthesise SiALON and Silicon Nitride Based Ceramics from Fly Ash by Department of Manufacturing Engineering, Annamalai University, T.N.

**Ongoing Projects:** Under the grant-in-aid scheme, nine projects continued during the period. These projects are as under:

- Waste Minimization in small scale Industries by NPC, New Delhi.
- Clean Technology for waste Minimization from Nutraceutical Industry, Mysore University, Mysore.
- Minimization of Environmental Impacts of Slaughter House Wastes by AMU, Aligarh.
- Biological Liquefaction of Waste Fleshing and Treatment with Tannery Effluent for Biogas Generation in Single Reactor by CLRI, Chennai.
- Waste Minimisation Studies in Electroplating Operation by M/s APITCO, Hyderabad.
- Evaluation of Refuse Derived Fuel from Waste Plastics as Engine Fuel Substitute by Annamalai University.
- Production of bioelectricity from sludge and domestic wastewater

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- using microbial fuel cell University of Calcutta, Kolkata.
- Waste Minimisation through co-composting by Annamalai University.
- Waste Minimisation in Moradabad Brassware Cluster by TERI, New Delhi.
- **Establishment of Waste Minimisation Circles (WMC):**

A total of 157 Waste Minimisation Circles in 41 sectors has been established through out the country till date. During the III<sup>rd</sup> phase of the project, 24 WMC, has been established in the important clusters.
- **Organisation of workshops/seminars:** The National Productivity Council has organized four regional workshops at Chennai, Ahmadabad, Hyderabad, Kolkata and Bangalore during the current financial year and four local levels at Indore, Devaas, Nagpur and Khurja.

#### Achievements made during the year

- **Under the grant-in-aid scheme two projects has been completed on “Abatement of Pollution through Preventive Strategies (Waste Minimisation)”.**
  - Waste Minimisation studies in Electroplating Industries in Balanagar Industrial area, Hyderabad by EPTRI, Hyderabad.
  - Enhancing the Environmental Performance and Competitiveness of Vegetable Oil Industry in Andhra Pradesh Winrock International India, Gurgaon.

#### Brief summary of the completed projects

#### Waste Minimisation Studies in Electroplating Industries in Balanagar

#### Industrial area, Hyderabad by EPTRI, Hyderabad.

Electroplating is one of the several techniques of metal finishing with largest users of many toxics chemicals in the country. This is the second largest end user of nickel and nickel compounds and end user of cadmium and cadmium compounds.

Electroplating is achieved by passing an electric current through a solution containing dissolved metal ions and the metal object to be plated. The metal object serves as the cathode in an electrochemical cell, attracting ions from the solution. Ferrous and non-ferrous metal objects are plated with a variety of metals including aluminum, brass, bronze, cadmium, copper, chromium, gold, iron, lead, nickel, platinum, silver, tin, and zinc. The process is regulated by controlling a variety of parameters including voltage and amperage, temperature, residence times, and purity of bath solutions. Plating baths are almost always aqueous solutions, therefore, only those metals that can be reduced in aqueous solutions of their salts can be electrodeposited. The only major exception to this principle is aluminum, which can be plated from organic electrolytes.

The proposed study has made some very useful recommendations which can lead to waste minimisation through recovery of metals, waste consumptions and energy savings etc. in the electroplating sector.

#### Enhancing the Environmental Performance and Competitiveness of the Vegetable Oil Industry by Winrock International.

Edible oil industry generates large quantities of wastewater. The wastewater of cotton seed edible oil mills can be categorized into process wastewater and non-process wastewater. Process wastewater contributes to most of the pollution load in the effluent being drained by the industry; while non-process

wastewater constitutes the major portion of total wastewater quantity. The process effluent is high in BOD, COD, TSS, TDS, oil, phosphate, sulfate and chloride. Concentration of these pollutants in the process effluent is much higher than allowable limits. These pollutants need to be removed from the effluent to prevent the damage being done to the environment. Apart from liquid waste, solid waste and air emissions are also generated. Solid waste generation is mainly in the form of spent earth, filter-cloth, and spent catalyst. Spent earth and spent catalyst are in slurry form and are combined together to extract what is known as "Carbon Oil" before their final disposal. After carbon oil extraction, the left over slurry is sold to contractors. Due to these problems and continuous pressure from regulators and local government to improve the environmental situation, many units have been forced to close down their operations. As a result, the sustainability of the industry has been at stake.

## Hazardous Substances Management (HSM)

### Brief Introduction and Objectives

Planning and overseeing the implementation of policies and programs on management of chemical emergencies and hazardous substances is the task assigned to the Hazardous Substances Management Division (HSMD). The mandate is to promote safe handling, management and use of hazardous substances which includes hazardous chemicals, hazardous and other wastes. The Scheme has the following main objectives:

- Creation of Hazardous Substances Management Structure in the States.
- Chemical Safety - management of chemical accidents.
- Proper handling and disposal of wastes.

The following four International Conventions are also handled in HSM Division:

- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal.
- Rotterdam Convention on Prior Informed Consent Procedure for certain Hazardous Chemicals in International Trade.
- Stockholm Convention on Persistent Organic Pollutants (POPs).
- Strategic Approach to International Chemicals Management (SAICM).

### Activities undertaken so far

#### Hazardous Waste Management Strategy

- A National Strategy on Hazardous Wastes Management has been formulated to facilitate effective management of hazardous wastes, so as to avoid environmental pollution and adverse health effects due to their improper handling & disposal. This strategy prescribe approaches and action points for regulatory bodies, generators of hazardous waste, recyclers and operators of facilities in order to minimize, recycle, treat and dispose of left over hazardous waste in an environmentally sound manner.
- This national strategy will facilitate implementation of the action plan brought out in National Environment Policy, 2006 in respect of management of hazardous waste and fulfill obligations under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal including their minimization, environmentally sound management and active promotion of cleaner technologies.

#### National Inventory of Hazardous Wastes

- As per information of Central Pollution Control Board (CPCB), there are about 40,000 industries in the country generating about 7.66 million Metric Ton (MT) of hazardous waste every year, of which landfillable waste is 3.39

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million MT (44.26%), incinerable 0.65 million MT (8.50%) and Recyclable Hazardous Waste is 3.61 million MT (47.13%).

- The Ministry has sponsored a project on GIS based National Hazardous Waste Information System. It is an online web based system, which can give the status of hazardous waste management in the country. The database is required to be regularly updated by all State Pollution Control Boards on web to ensure updated status at all times.

#### Treatment, Storage and Disposal Facilities (TSDFs)

- 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), Orissa (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. During the year, financial assistance of Rs. 1.20 crore has been provided for setting up of TSDF at Pithampur (Madhya Pradesh).

#### Co- incineration of High Calorific Value Hazardous Wastes

- To promote co-processing/co-incineration of hazardous wastes, the Ministry has approved a project on 'Trail 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 instalment of Rs. 2.00 crores has been released to CPCB for carrying out trial runs for eight categories of hazardous wastes in four plants each of cement, thermal power plants, iron and steel industries during the year 2010-11.

#### E-waste Management

- According to CPCB, the e-waste inventory in India for the year 2005 has been estimated to be 1.46 lakh tonnes, which is expected to exceed 8.0 lakh tonnes by 2012. About 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. Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab in the list of e-waste generating states in India. Among top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bangalore, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur.
- The Ministry has notified E-Waste (Management and Handling) Rules, 2011 on 12<sup>th</sup> May 2011. These Rules will be applicable to e-waste generated from IT and telecommunication equipment and Consumer electrical and electronics i.e. Television sets (including LCD & LED), Refrigerators, Washing Machines and Air-conditioners. These Rules empower the concerned State agencies to control, supervise and regulate relevant activities connected with e-waste management such as collection, segregation, dismantling and recycling.
- The concept of Extended Producer Responsibility (EPR) has been enshrined in these Rules. Accordingly, Producers are required to set up collection systems and meet the costs involved in the environmentally sound management of

e-waste generated from the 'end of life' of their own products. Besides, threshold limits, which are accepted globally, have been prescribed for six hazardous substances used in manufacture of electrical and electronics components. Producers are expected to achieve reduction in use of the hazardous substance (RoHS) to the prescribed limit within a period of two years from the date of commencement of these rules. These rules will be the main instrument to ensure environmentally sound management of e-waste. These Rules shall come in to force from 1<sup>st</sup> May 2012.

### Chemical Safety

- The Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989 and the Chemical Accident (Emergency Planning, Preparedness and Response) Rules, 1996 are the main instruments for ensuring chemical safety in the country. There are 1905 Major Accident Hazard (MAH) units in the Country, located in 304 districts.
- A sub-scheme entitled "Industrial Pocket-wise Hazard Analysis" has been in operation since the Eighth Five Year Plan. During 2010-2011, the Ministry has initiated preparation of Hazard Analysis and Off-site Emergency Plan for 46 districts. For ensuring chemical safety, following documents have been published and circulated:
  - Guidelines for Off-site Emergency Plan preparation
  - National Chemical Accident Database
  - National Profile on Major Accident Hazard Installations
  - Handbook titled Do's and Don'ts of Highly Toxic and Flammable Chemicals

The Ministry has initiated the development

of Web based Emergency Planning and Response System for the selected districts of Andhra Pradesh, Haryana, Punjab, Rajasthan, Tamil Nadu, Uttarakhand and Uttar Pradesh States.

The Ministry has developed the National Implementation Plan (NIP) under the Stockholm Convention on Persistent Organic Pollutants.

### Plastic Waste (Management and Handling) Rules, 2011

- New Plastic Waste (Management and Handling) Rules, 2011 have been notified to replace the earlier Recycled Plastics Manufacture and Usage Rules, 1999, under the Environment (Protection) Act, 1986. As per the new Rules, plastic carry bags shall not be less than 40 microns in thickness. Under the earlier Rules, the minimum thickness for plastic carry bags was 20 microns. Plastic carry bags shall either be in natural shade (colourless) or with colour in conformity with Bureau of Indian Standards (BIS) specifications. Plastic material, in any form cannot be used for packing gutkha, pan masala and tobacco in all forms.

In the new Rules, certain new features have been introduced. No carry bags shall be made available free of cost to consumers by retailers. The municipal authority may determine the minimum price for plastic carry bags in order to encourage their re-use so as to minimize plastic waste generation. Municipal Authority shall be responsible for setting up, operationalisation and coordination of the waste management system and for ensuring safe collection, storage, segregation, transportation, processing and disposal of plastic waste. For this, the municipal authority may seek the assistance of manufacturers of plastic carry bags, multilayered plastic pouches or sachets or of brand owners using such products.

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### Bio-Medical Waste Management

- As per the Annual Reports submitted by the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) of Union Territories for the year 2010, there are 188 Common Bio-Medical Waste Treatment and Disposal Facilities (CBMWTFs) in operation and 17 CBMWTFs under installation. Besides, there are 688 incinerators, 2710 autoclaves, 179 microwaves, 13 hydroclaves and 4250 shredders as captive treatment equipments being operated by the individual health care facilities.
- The Ministry has notified the draft Bio-Medical Waste (Management & Handling) Rules, 2011 on 24<sup>th</sup> August, 2011 to replace the earlier Bio-Medical waste (Management & Handling) Rules, 1998 and the amendments made thereon. It is proposed in the new Rules inter alia to cover all the health care establishments, including all veterinary institutions generating bio-medical waste, irrespective of the number of patients serviced per month for obtaining authorization from the Prescribed Authority. Presently, only those HCEs which provide health care service for 1000 patients or more per month are required to obtain authorization from the Prescribed Authority, i.e., the State Pollution Control Board. Various suggestions/objections on the draft Rules have been received.
- The Ministry is implementing a UNDP-GEF project on 'Demonstrating and Promoting Best Techniques and Practices for Reducing Health-care Waste to Avoid Environmental Releases of Dioxins and Mercury', with the aim to protect human health and environment from the impacts of dioxins and mercury releases. The project aims to demonstrate best practices and techniques for healthcare waste management in the states of Tamil Nadu and Uttar Pradesh.

- Financial assistance has been provided to various organizations for conducting awareness and training programmes on Bio-Medical Waste Management.

### Remediation of Contaminated Hazardous Waste Dump Sites

- A project with the assistance of World Bank is being implemented by the Ministry of Environment and Forests to remediate ten highly polluted sites, two in Andhra Pradesh and eight in West Bengal on pilot basis. This project will also develop a National Programme for rehabilitation of polluted sites and build human and technical capacity in selected Pollution Control Boards for undertaking environmentally sound remediation of polluted sites. The total cost of the project is USD 75.39 million (Rs. 339.26 crores approx.) for a period of five years.
- This Ministry has simultaneously initiated a project for 'Remediation of contaminated Hazardous Waste Dump Sites' under the National Clean Energy Fund. Twelve contaminated areas have been identified as priority sites in the country. This will supplement the work being taken under the World Bank project.

### Central Sector Scheme for setting up of Common Treatment and Disposal Facilities for Hazardous, Bio-medical and E-wastes

- The Ministry has revamped the Central Sector Scheme to encourage setting up of common treatment and disposal facilities for hazardous wastes and bio-medical wastes. The central government assistance has been increased from 10 % to 25 % of total project cost. In the case of NE States, 50 % of the total cost of the project is given as central government assistance. The central government assistance is subject to the availability of matching grant from the State government. The revised scheme

also covers Integrated E-Waste Recycling, Treatment and Disposal facilities.

### **E-Waste (Management and Handling) Rules, 2011**

- The Ministry has notified E-Waste (Management and Handling) Rules, 2011 on 12<sup>th</sup> May 2011. These Rules will be applicable to e-waste generated from IT and telecommunication equipment and Consumer electrical and electronics i.e. Television sets (including LCD & LED), Refrigerators, Washing Machines and Air-conditioners. These Rules empower the concerned State agencies to control, supervise and regulate relevant activities connected with e-waste management such as collection, segregation, dismantling and recycling.
- The concept of Extended Producer Responsibility (EPR) has been enshrined in these Rules. Accordingly, Producers are required to set up collection systems and meet the costs involved in the environmentally sound management of e-waste generated from the 'end of life' of their own products. Besides, threshold limits, which are accepted globally, have been prescribed for six hazardous substances used in manufacture of electrical and electronics components. Producers are expected to achieve reduction in use of the hazardous substance (RoHS) to the prescribed limit within a period of two years from the date of commencement of these rules. These rules will be the main instrument to ensure environmentally sound management of e-waste. These Rules shall come in to force from 1<sup>st</sup> May 2012.

### **Plastic Waste (Management and Handling) Rules, 2011**

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under the Environment (Protection) Act, 1986. As per the new Rules, plastic carry bags shall not be less than 40 microns in thickness. Under the earlier Rules, the minimum thickness for plastic carry bags was 20 microns. Plastic carry bags shall either be in natural shade (colourless) or with colour in conformity with Bureau of Indian Standards (BIS) specifications. Plastic material, in any form can not be used for packing gutkha, pan masala and tobacco in all forms.

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### **Draft Bio-Medical Waste (Management & Handling) Rules, 2011**

- The Ministry has notified the draft Bio-Medical Waste (Management & Handling) Rules, 2011 on 24<sup>th</sup> August, 2011 to replace the earlier Bio-Medical waste (Management & Handling) Rules, 1998 and its amendments made thereon. The draft Rules have been published for public comments/suggestions. Various suggestions/objections on the draft Rules have been received. The major changes proposed in the draft Rules are:

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- i. Simplification of color coding for segregation of waste at the source of generation of bio-medical waste.
  - ii. Mandatory for obtaining of authorization by all the Health Care Facilities (HCFs) irrespective of generation of bio-medical waste as well as number of patients treated per month.
  - iii. Constitution of district level committee for monitoring implementation of various provisions of these rules.
  - iv. Precautionary principles including safety of the workers handling bio-medical waste.
  - v. Various authorities have been identified with their roles and responsibilities. The Proposed draft Rules have stipulated duties for concerned Ministries/ Departments, viz., Central and State Ministries of Environment and Forests, Central and State Ministries of Health and Family Welfare, Central and State Departments of Veterinary and Animal Husbandry; Ministry of Defence; Central Pollution Control Board, State Government or Union Territory Government or Administration; State Pollution Control Boards or Pollution Control Committees and Local Bodies such as Gram Panchayat, Municipalities or Corporations.
- Draft Hazardous Substances (Classification, Packaging and Labelling) Rules, 2011**

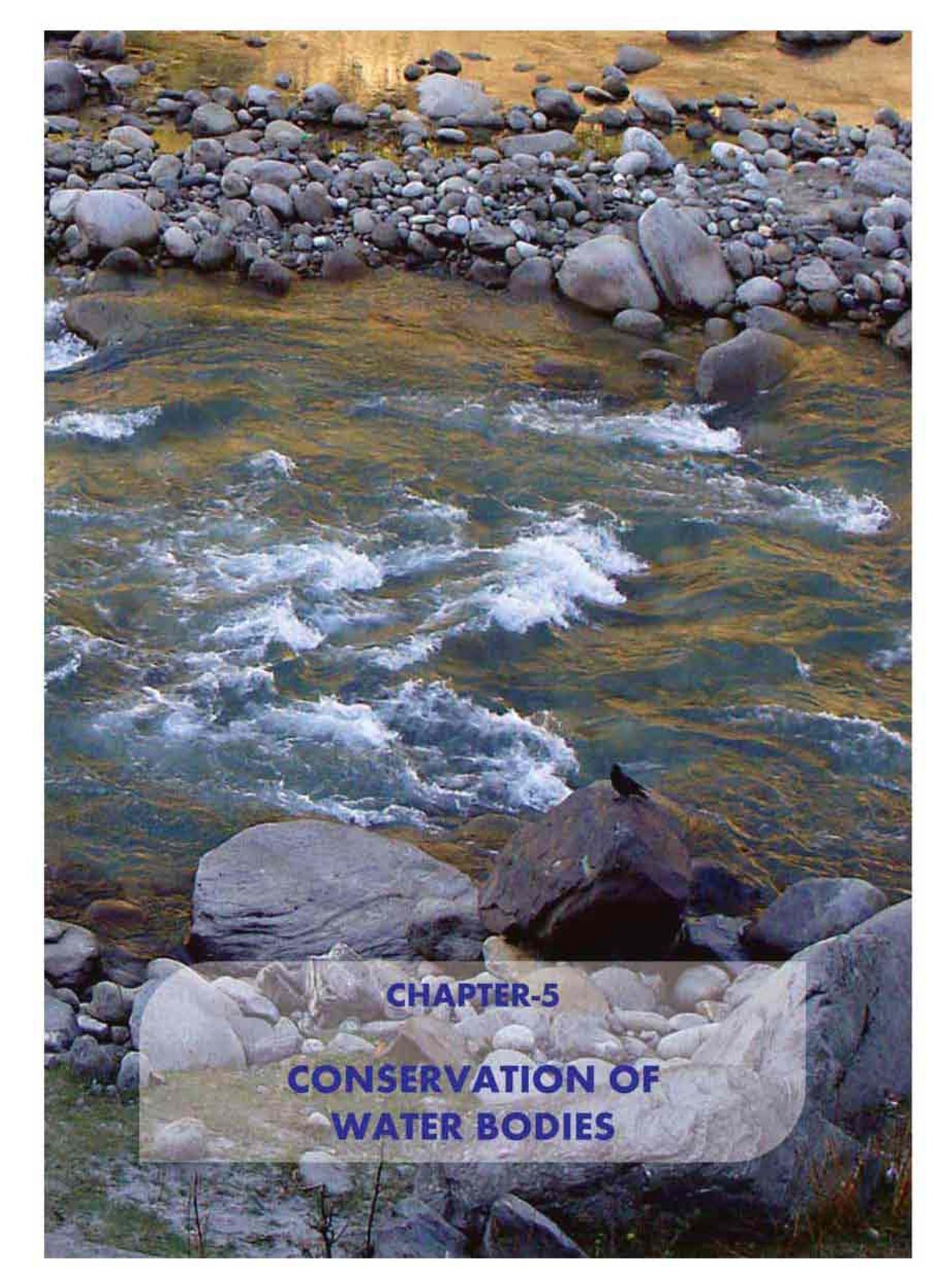
- The Ministry of Environment and Forests has notified the draft Hazardous Substances (Classification, Packaging and Labelling) Rules, 2011 for proper classification, packaging and labelling of hazardous substances. The draft Rules have been published for public comments. The salient features of the draft Rules include the following:

- i. These rules shall apply to hazardous substances, hazardous chemicals and dangerous goods as specified in the list of chemicals.
- ii. The responsibilities of occupier and consigner have been prescribed. They are required to assign hazard classes, use proper shipping name, suitable packaging, requisite label, marking and use of updated Safety Data Sheet for transportation. The Rules mandate training of persons engaged in handling, storage and transport of dangerous goods.
- iii. Various classes of hazardous substances have been specified viz. explosives, gases, flammable liquids, flammable solids, oxidizing substances, toxic and infectious substances, radioactive materials, corrosive substances and miscellaneous dangerous substances.
- iv. The assignment of United Nations number and proper shipping names has been prescribed as per its hazard classification and composition. Packaging provisions have been assigned for handling of hazardous substances. Labelling provisions, viz., trade name, substance name, Chemical Abstract Number, gross weight, name and address of manufacturer, importer, supplier, emergency contact number, hazard class, packing group, play card, etc have been provided.

The draft Rules will be finalized based on the comments to the draft Rules.

#### **Budget allocation of the scheme during the year and Progress of Expenditure**

An amount of Rs.7.5 crores was allocated for the year 2011-12 and 100% expenditure is expected to be achieved by March 2012.



**CHAPTER-5**

**CONSERVATION OF  
WATER BODIES**

## National River Conservation Directorate

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.

### National River Conservation Plan Introduction

The objective of National River Conservation Plan (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. So far a total of 39 rivers have been covered under the programme. The rivers are:

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.

### Recent Initiatives in River Conservation Mission

#### National Ganga River Basin Authority

National Ganga River Basin Authority (NGRBA) was constituted on 20<sup>th</sup> February, 2009, under the chairmanship of the Prime Minister as an empowered planning, financing, monitoring and coordinating

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

authority for the Ganga River, in exercise of the powers conferred under the Environment (Protection) Act, 1986.

In its first meeting on 5<sup>th</sup> October, 2009, the Authority decided that under *Mission Clean Ganga* it will be ensured that by 2020 no untreated municipal sewage and industrial effluents flow into Ganga and the investments required to create the necessary treatment and sewerage infrastructure will be shared suitably between the Centre and the State Governments.

An Action Plan was approved by the NGRBA in its first meeting, to achieve the aforesaid Mission objective. Implementation of this Action Plan was reviewed in the 2<sup>nd</sup> Meeting of the NGRBA on 1<sup>st</sup> November, 2010.

The following steps have been taken by the Ministry of Environment & Forests to implement the Action Plan:

- **Preparation of Basin Management Plan:** A comprehensive River Basin Management Plan for Ganga is being prepared. This work has been entrusted to a consortium of seven IITs (Kanpur, Delhi, Madras, Bombay, Kharagpur, Guwahati and Roorkee). In this regard, a Memorandum of Agreement (MoA) has been signed on 6<sup>th</sup> July, 2010 by the MoEF & the IITs.

The Plan is being prepared with the objective of taking comprehensive measures for restoration of the wholesomeness of the Ganga system and improvement of its ecological health. The Plan will be the basis for specific projects to be undertaken, policy interventions required and non-project



Fig-50. Phawngpui Mountain – the highest peak in Mizoram

investments under NGRBA. The consortium has submitted first set of five reports. They are preparing second set of 17 reports under the Ganga River Basin Management Plan.

- **Revision of Guidelines for preparation of DPRs:** The guidelines prepared in the year 2002 for Detailed Project Report (DPR) preparation have been revised with the help of IIT Roorkee. As per new guidelines whole river basin will be considered for funding for river conservation schemes. Preparation of City Sanitation Plan is required. On that basis schemes will be selected and prioritized for abatement of pollution. Prefeasibility report will also be prepared before preparing DPR. Operation and Maintenance (O&M) plan for first five years will be inbuilt in the DPR whereas for next 10 years O&M plan based on recovery will be included. Stake holder consultation at project formulation stage, holistic approach and provision of integrated sewer network up to the house property line, in place of drain interception and diversion to ensure 100% sewage collection, signing of tripartite MoA among Government of India, State Government and Urban

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Local Bodies to bind them for release of funds, timely completion of projects, ensure house connection and O&M of assets, appraisal of projects proposals by independent institutions/experts to enhance quality of DPR and cost optimization are some of the new additions in the guidelines.

- **Initial portfolio of projects:** In order to bridge the critical deficit in sewage infrastructure and treatment capacity, and other related activities for river conservation in towns along the river Ganga the first phase of projects worth Rs.2696 crores has been approved for development of sewer networks, sewage treatment plants and sewage pumping stations, electric crematoria, community toilets, development of river fronts, etc. These projects are currently under implementation by the states.
- **Funding of NGRBA projects:** The existing NRCP funding pattern i.e. 70:30 between the Centre and States is being followed for NGRBA projects. Planning Commission has agreed to the proposal that the O&M costs of the assets created under NGRBA will be shared by the Central and State Governments on 70:30 basis for three years. It was decided in the second meeting of NGRBA that O&M costs of assets created under NGRBA will be shared between Centre and the States for five years, with a review at the end of two/three years. During this time, the States are expected to build the technical and financial capacity of ULBs to ensure O&M on a sustained basis.
- **Measures for improving implementation:** The following are among the measures taken to improve implementation of projects under NGRBA;
  - **Standing Committee and Empowered Steering**

**Committee:** A Standing Committee of NGRBA has been constituted with Union Finance Minister as chairman to function on behalf of the Authority, take necessary decisions and periodically review and assess implementation of Authority's work programme and prescribe measures to achieve its objectives. An Empowered Steering Committee (ESC) has been constituted for appraisal and sanction of project proposals on a Fast Track Mode.

- **State River Conservation Authorities:** To facilitate better coordination and implementation of the conservation activities at the State level, Empowered State River Conservation Authorities (SRCAs) have been notified under Environment (Protection) Act, 1986 for all the five Ganga States.
- **National Mission for Clean Ganga:** National Mission for Clean Ganga (NMCG), a registered society has been setup at the central level to plan and implement the NGRBA programme in coordination with the State Agencies concerned. The NMCG is headed by a Mission Director.
- **Dedicated implementation institutions in States:** States have been requested to set up dedicated entities for timely implementation and proper O&M of NGRBA projects.
- **Memorandum of Agreements (MoA):** Tripartite MoAs are being signed with the State Governments/ Urban Local Bodies in respect of sanctioned projects. The MoAs provide for commitments by the Centre and States for funding of the projects, regular monitoring and review of implementation, coordination by the State Governments with the ULBs

and other agencies to ensure synergy with programs like JNNURM/UIDSSMT etc. Twenty nine MoAs have been signed so far.

- **Independent appraisal of Detailed Project Reports:** Reputed professional institutions have been appointed for appraisal of DPRs for works to be taken up for sanction under NGRBA.
- **Third Party Inspection:** Third Party Inspection (TPI) for projects has been introduced, covering all four stages in the life cycle of a project, namely Pre-construction, Construction, Commissioning & trial run and Post-construction. The inputs of third party inspection will be taken into consideration before release of funds.
- **Industrial Pollution:** In order to effectively tackle the problem of industrial pollution, a dedicated cell is being set up in CPCB for inspection and monitoring of industrial units discharging effluents into the river Ganga. In the first instance, the cell will focus its efforts on the critical stretch of about 500 kms from Kannauj to Varanasi.

### **National River Conservation Plan (NRCP) – (Other Schemes)**

The schemes of GAP-II and other rivers of the country have now been merged under one Centrally Sponsored Scheme of National River Conservation Plan based on 70:30 funding pattern and presently National River Conservation Directorate (NRCD) is undertaking all river water pollution abatement works under this head.

At present, the National River Conservation Plan (NRCP) includes works in 190 towns along polluted stretches of 39 rivers spread over 20 states (Annexure-V). This includes works undertaken under GAP-II. The total cost of the sanctioned projects is

about Rs. 7639 crore. An amount of Rs. 3844 crore has been released by the Government of India so far. 865 schemes have been completed as against 1151 number sanctioned of schemes. 4939 mld has been sanctioned so far on the basis of sanctioned DPRs within the approved cost of the respective projects and a capacity to treat 4574 mld of sewage has been created till the end of December, 2011 in addition to 869 mld already created under the completed project of Ganga Action Plan Phase-I. Prevention and control of industrial pollution is being addressed by the Central and State Pollution Control Boards/Pollution Control Committee.

### **National River Conservation Plan (Externally Aided Projects)**

#### **Yamuna Action Plan (YAP)–(Phase-I)**

Yamuna Action Plan (YAP) Phase I was launched by the Ministry to take up the pollution abatement works in Yamuna river in the States Uttar Pradesh, Delhi & Haryana in April 1993 as a component of Ganga Action Plan Phase-II with a loan assistance from Japan Bank for International Cooperation (JBIC). This project has been completed at a total cost of Rs.682 crores and 269 out of the total 269 schemes have been completed in February 2003. Under this plan, a sewage treatment capacity of 753.25 mld out of the envisaged capacity of 753.25 has been created, with the state-wise break up of 322 mld (in Haryana), 401.25 mld (for U.P.) and 30 mld. (in Delhi).

#### **Yamuna Action Plan (Phase-II)**

Government of India, Ministry of Environment & Forests have received financial assistance of Yen 13.33 billion from the Japan International Cooperation Agency (JICA) for implementation of Yamuna Action Plan (YAP) Phase II, which is part of the National River Conservation Plan (NRCP).

The loan agreement between Government of Japan and Government of

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India has been signed on 31<sup>st</sup> March 2003. The project has been approved by CCEA at an estimated cost of Rs. 624 crore for abatement of pollution of river Yamuna in Delhi, UP (eight towns) and Haryana (six towns) under YAP-II. The cost of works under YAP-II is to be shared between Government of India and State Governments in the ratio of 85:15 i.e. Rs. 530 crore Central share and Rs. 94 crore States' share. Pollution abatement schemes for creation of 189 mld sewage treatment capacity have been sanctioned so far under the Plan at a cost of Rs.647.86 crore, out of which an amount of Rs.358 crore has been released towards Central share. The works under YAP-II are in advanced stages.

YAP-II project also includes preparation of DPRs for projects in the three States which are proposed to be undertaken under YAP-III with JICA assistance.

The cost of works to be executed in the three States under YAP-II comprises of:

Delhi	Rs. 387.17 crore
UP	Rs. 124.13 crore
Haryana	Rs. 62.50 crore
Miscellaneous (WQM, Capacity building, Consultancy etc.)	Rs. 50.20 crore

### **Yamuna Action Plan (Phase-III)**

Yamuna Action Plan (YAP) Phase - III project shall be implemented in Delhi with the assistance from Japan International Cooperation Agency (JICA) at an estimated cost of Rs. 1656 crore. The project cost will be shared between the Government of India (GoI) and the Government of NCT of Delhi on 85:15 basis. The share of GoI will be Rs. 1407.6 crore and that of Government of NCT of Delhi will be Rs. 248.4 crore. JICA has agreed to provide a loan assistance of \$ 32571 Million to GoI for the proposed project, which will constitute the central share of the project equivalent to 85% of the total

project cost as per pattern adopted for the earlier JICA assisted YAP-II project.

Under YAP-III, it is proposed to rehabilitate the damaged trunk sewers to maximize the utilization of available treatment capacity, rehabilitate and modernize the STPs in three catchment areas of Delhi namely Okhla, Kondli and Rithala and to equip them with tertiary level treatment facilities to achieve treated effluent quality of 10 mg/l for Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) so as to improve the water quality of river Yamuna. The proposed works are (a) Rehabilitation/modernization of STPs, totaling 814 MLD capacity at Okhla, Kondli and Rithala in Delhi. (b) Setting up of Tertiary Treatment Facilities at the above STPs (c) Construction of a new state of art STP in place of old STP of 136 MLD capacity at Okhla. (d) Rehabilitation of sewer lines/rising mains in the two catchments of Delhi viz Kondli and Rithala. (d) Public Outreach Activities. These works will be integral to the Sewerage Master Plan being prepared by Delhi Jal Board (DJB).

The project will be implemented by DJB under the supervision of the Department of Urban Development, Government of NCT of Delhi. The Ministry of Environment and Forests will monitor the progress of work. The implementation of the project will be over a period of seven years. Project Management Consultant will be appointed by DJB to assist in project implementation. The operation and maintenance (O&M) of the assets created under the project will be the responsibility of the State Government/DJB. The project will be completed in seven years.

### **National Ganga River Basin Authority (NGRBA)**

### **JICA assisted Ganga Action Plan (GAP) Project at Varanasi**

Based on the project proposal/feasibility study prepared under the JICA assisted development study, the GAP project at

Varanasi has been approved for funding by JBIC for 11.184 billion Yen.

The project consists of the following components:

- Sewerage component (comprising of trunk sewers, pumping stations and related rising mains, rehabilitation of old trunk sewers and five ghats pumping stations, renovation of existing STPs, construction of 140 mld new STP at Sathwa and land acquisition)
- Non-sewerage component (comprising of community toilet complexes in slum areas, construction of dhobi ghats and improvement of bathing ghats)
- Public awareness and participation programme
- Institutional Development programme for the local body (Varanasi Nagar Nigam and Varanasi Jal Sansthan) to enable proper O&M of the assets created.

UP Jal Nigam is the project implementing agency (PIA) for the sewerage component while the non-sewerage component would be implemented by Varanasi Nagar Nigam.

Pollution abatement schemes for creation of 140 mld sewage treatment capacity have been sanctioned so far under the Plan at a cost of Rs.496.90 crore.

### **World Bank Assisted project for pollution abatement of river Ganga under NGRBA**

A project with World Bank assistance for abatement of pollution of river Ganga at an estimated cost of Rs.7000 crore has been approved for implementation. The Bank will support the Government of India by providing technical assistance and financing of US \$ one billion (approx. Rs.4600 crore). The share of Government of India will be Rs.5100 crore and that of the State Governments of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal will be Rs.1900 crore. States will have dedicated Project

Management Group (PMG) under the State nodal Departments for planning, coordination, monitoring implementation and reporting of the projects taken up under the Programme.

To achieve the objective of Mission Clean Ganga as resolved by NGRBA and to ensure that by the year 2020, no untreated municipal or industrial effluent will be allowed to be discharged into the river Ganga, and an investment of Rs.15000 crore was estimated.

### **Other initiatives: North East**

Identification of polluted stretches of rivers and polluting towns in rest of the North-Eastern (NE) states are being carried out by the state governments. On the basis of survey, investigation and DPRs, rivers from NE states would be considered for inclusion under NRCP. The cost sharing ratio between the Centre and States of the projects under NRCP and NLCP in the NE states is 90:10. The State Governments have been advised to prioritise the works for the polluted stretches identified by the CPCB and to send proposals for pollution abatement works.

### **Water Quality Management Plan for River Ganga**

The water quality of river Ganga is being monitored since 1986 from Rishikesh in Uttaranchal to Uluberia in West Bengal by institutions such as Pollution Control Research Institute, Hardwar, CPCB Zonal Office, Lucknow, Indian Institute of Technology (IIT), Kanpur, Patna University and Bidhan Chandra Krishi Vishwavidyalaya, Kalyani. As a result of the projects completed under Ganga Action Plan, the water quality of river Ganga has shown a general improvement despite tremendous population growth along the river banks as compared to pre-GAP period. Water quality monitoring carried out by reputed institutions such as, IIT, Kanpur, Bharat Heavy Electricals Ltd. (BHEL), Patna University, etc. indicates that, water quality of the river Ganga conforms to the prescribed

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standards in terms of key indicators, namely, Bio-chemical Oxygen Demand (BOD) and Dissolved Oxygen (DO) at most of the locations, except in the stretch between Kannauj and Varanasi in Uttar Pradesh. The level of bacterial contamination in terms of fecal coliform however, exceeds the maximum permissible limit at most monitoring stations along the river.

The summer average values of two important river water quality parameters viz. Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD) recorded in some of the important monitoring stations on river Ganga is given in Table-32.

A very significant factor is increasing demand due to large scale water extraction for various purposes including irrigation, drinking water supply, and power projects. Besides this, inadequate operation and maintenance (O&M) by the States, under-utilisation of the STPs in some instances, delay in acquisition of land, contractual issues, court cases, erratic power supply and inadequate capacities of local bodies/agencies and lack of involvement of civil society were some of the constraints faced in the implementation of the Ganga Action Plan. The pollution load on rivers has increased over the years due to rapid urbanisation and

**Table-32.** Water Quality Data For River Ganga (Summer Average i.e. March-June)

S. No.	Station/Location	Distance (KM)	1986		2011	
			DO(mg/l)	BOD(mg/l)	DO(mg/l)	BOD(mg/l)
1.	Rishikesh	0	8.1	1.7	7.6	1.4
2.	Hardwar D/s	30	8.1	1.8	7.4	1.6
3.	Garhmukteshwar	175	7.8	2.2	7.5	1.7
4.	Kannauj U/S	430	7.2	5.5	7.9	1.7
5.	Kannauj D/S	433	NA	NA	8.1	3.2
6.	Kanpur U/S	530	7.2	7.2	7.7	3.3
7.	Kanpur D/S	548	6.7	8.6	7.6	3.8
8.	Allahabad U/S	733	6.4	11.4	7.8	5.3
9.	Allahabad D/S	743	6.6	15.5	7.8	5.1
10.	Varanasi U/S	908	5.6	10.1	8.0	2.9
11.	Varanasi D/S	916	5.9	10.6	8.0	4.3
12.	Patna U/S	1188	8.4	2.0	7.0	1.8
13.	Patna D/S	1198	8.1	2.2	7.1	2.5
14.	Rajmahal	1508	7.8	1.8	6.8	1.5
15.	Palta	2050	N/A	N/A	7.3	2.3
16.	Uleberia	2500	N/A	N/A	6.6	2.8

**Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD)**

**Bathing Water Quality Criteria : DO equal to or more than 5.0 mg/l  
BOD equal to or less than 3.0 mg/l**

\* The above data are on the basis of the Water Quality Monitoring in various stretches of the river done by the following independent institutions -

1. Pollution Control Research Institute (PCRI), Bharat Heavy Electricals Ltd. (BHEL), Hardwar (Rishikesh to Anoopshahr), (Badrinath to Hardwar)
2. Central Pollution Control Board (CPCB) (Allahabad to Tarighat)
3. Deptt. of Zoology, Patna University (Buxar to Sahebganj in Bihar)
4. Deptt. of Civil Engg., Indian Institute of Technology (IIT), Kanpur (Kannauj U/S to Kanpur D/S), Bidhan Chandra Krishi Vishwavidyalaya, West Bengal, (Berhampore to Uluberia)

industrialization. Domestic sewage is the major source of pollution of rivers besides industrial and other non-point sources of pollution.

The water quality monitoring has also been undertaken for rivers namely, Yamuna, Western Yamuna Canal, Gomti, Hindon, Satluj (Punjab), Cauvery (Tamil Nadu), Tungbhadra in Karnataka and Waterways of Chennai. The number of monitoring stations presently are 158 in 10 rivers which include 27 stations set up in the upper reaches of Ganga and 32 stations of Chennai Waterways.

### National Lake Conservation Plan

#### Objectives

The objective of the Scheme is to restore and conserve the polluted lakes in urban and semi-urban areas of the country degraded due to waste water discharge into the lake. The activities covered under NLCP include the following:

- Prevention of pollution from point sources by intercepting, diverting and treating the pollution load entering the Lakes from the entire lake catchment area.
- In-situ measures of Lake cleaning such as De-silting, De-weeding, Bio-remediation etc. depending upon the site conditions.
- Catchments area treatment which may include bunding, afforestation, storm water, drainage, fencing and shore line development etc.
- Public awareness and public participation
- Other activities depending upon location specific conditions including public interface.

### Projects approved under NLCP

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 crore (Annexure-III). 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 the State Government.

#### NLCP Guidelines

With the experience gained in implementation of projects sanctioned under the NLCP, it was considered imperative to make successive improvements in the existing



Fig-51. A view of sunset at Bor lake, Gujarat

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Fig-52. A view of Indus river at Leh

system of project formulation and implementation. In the process, many of the eminent experts in the field, concerned State Governments/Implementing Agencies and all relevant stakeholders were consulted. The existing guidelines of NLCP have since been revised after due incorporation of responses of State Governments and experts feedback.

The revised NLCP guidelines are accessible on the Ministry's website.

### Budget Allocation

Budget Allocation for 2011-12 under National River Conservation Plan and National Lake Conservation Plan is given in Table-33.

**Table-33.** Budget Allocation for 2011-12 under National River Conservation Plan and National Lake Conservation Plan

(Rs. in Crore)

Sl. No.	Name of the Plan	Budget Estimate	Revised Estimate	Expenditure by GOI (December 2011)
1	National River Conservation Directorate (NRCD)	6.71	6.71	4.17
2	National River Conservation Plan (NRCP)	195.00	165.00	141.02
3	National Ganga River Basin Authority (NGRBA)	500.00	216.61	190.59
4	National Lake Conservation Plan (NLCP)	50.00	80.00	79.90
	<b>Total</b>	<b>751.71</b>	<b>468.32</b>	<b>385.68</b>

## Names and addresses of implementing agencies

The names and addresses of State Implementing Agencies under NRCP are at Annexure-V.

## National Wetland Conservation Programme (NWCP)

### Brief Objectives

The programme was initiated in 1987 with the following objectives:-

- to lay down policy guidelines for conservation and management of wetlands in the country;
- to provide financial assistance for undertaking intensive conservation measures in the identified wetlands;
- to monitor implementation of the Programme; and
- to prepare an inventory of Indian wetlands.

## Central Wetlands Regulatory Authority (CWRA)

Central Government notified the Wetlands (Conservation and Management) Rules - 2010 vide notification no. GSR-951(E) dated 4<sup>th</sup> 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). The main functions of CWRA are:

- Appraise proposals for identification of new wetlands.
- To enforce the provisions contained under these rules along with other laws in force;
- Grant clearances or identify the areas for the grant of clearance for regulated activities in the wetlands under jurisdictions;
- Issue whatever directions, from time to time necessary for the conservation,

preservation and wise use of wetlands to the State Governments.

- Review the list of wetlands and the details of prohibited and regulated activities under the rules and the mode and methodology for execution.

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. Functions of the Group are:

- Identification of new wetlands for conservation under NWCP.
- In-depth examination of Management Action Plans of the newly identified wetland as per guidelines prescribed by the GOI.
- Suggest amendments to guidelines, if any, for identification of new wetlands, for formulation of Management Action Plan and for identification of priority areas of research.

Over the years, based on the recommendations of National Wetlands Committee, 115 wetlands have been identified so far for conservation under the National Wetland Conservation Programme (Annexure-VI B).

The Research projects to supplement Management Action Plans (M.A.Ps.) for intensive conservation on thrust areas of research are considered by the Thematic Group for conservation of Wetlands and Mangroves constituted by RE Division in the Ministry. List of the research project sanctioned during 2010-11 is annexed (Annexure-III).

## Activities under MAPs of identified wetlands

Main Activities under MAPs of Wetlands for which funds provided, include:

- Survey and demarcation
- Catchment area treatment

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- Protection measures
- Fisheries development
- Weed control
- Wildlife conservation
- Pollution abatement
- Research on various aspects of Wetlands
- Eco-development activities
- Education and awareness

To supplement the Management Action Plans, assistance is also given for research & developmental activities in various thrust areas of research which are as follows:

- Survey and assessment of resources
- Value of wetlands
- Hydrological functions and assessment of associated values
- Assessment and conservation of wetland biodiversity
- Anthropogenic pressures and natural calamities
- Socio-economic aspects

#### Progress/Achievements made during the year

#### National Wetland Conservation Programme

- During the year 2011-12, Management Action Plans of 35 wetlands were approved and financial assistance released to the concerned State Governments. So far, an amount of Rs.10.34 crores has been released (till 31<sup>st</sup> December, 2011) against the total allocation of Rs.11.90 crores. An additional grant of Rs.3.00 crores has been proposed during 2011-12 for sanction of management action plans of those wetlands which in-spite of identification could not be given assistance for constraint of funds.
- Funds were released for eight research projects the new and ongoing.

- Two meetings of Central Wetlands Regulatory Authority (CWRA) held under the chairmanship of Secretary (E&F)
- One regional workshop at Leh Ladakh (J&K) organized during the current financial year for providing training to wetland managers for implementation of Management Action Plans in high altitude wetlands in the states.
- Two new research projects sanctioned during current financial year.
- As per decision of CWRA in the first meeting held on 25<sup>th</sup> March, 2011, three members committee constituted to frame draft guidelines.
- Revised management action Plan of Wullar Lake received at the total cost of Rs.120 crores from Jammu & Kashmir Government. Out of Rs.120 crores, an amount of Rs.30 crore has been allocated for the current financial year for survey and demarcation and other priority components in a meeting of experts constituted for this purpose by MoEF. As per decision of the expert group, Ministry of Finance was requested to release first installment of Rs.30 crores for the current financial year for conservation of Wullar Lake. This amount has already been received by the state govt.
- Organized a workshop on the eve of World Wetland Day -2011 at Keoladeo National Park, Bharatpur for sensitizing the state governments about the activities to be undertaken in the wetlands notified under the Wetlands (Conservation and Management) Rules -2010.
- A meeting for Pulicat wetland a trans-boundary wetland in Andhra Pradesh and Tamil Nadu was held in Chennai on 29<sup>th</sup> August, 2011 under the chairmanship of Secretary (E&F) to finalize tentative plan from Andhra Pradesh and Tamil Nadu. In a meeting recently held on Pulicat Lake with officials

of governments of Tamil Nadu and Andhra Pradesh under the chairmanship of Secretary (E&F), both the governments were asked to send Terms of References (TORs) for preparation of joint action plan. Thereafter consultant will be selected to make comprehensive action plan for which assistance will be released as per norms.

### International issues and Ramsar Convention

- Twenty five sites have already been designated as Ramsar sites in India till date. (Annexure-VI A). Six (6) more wetlands are under process of being designated as Ramsar sites.
- India was re-nominated as Member of Supervisory Council for another term (2008-2011) on the basis of its achievement for conserving Wetlands of the country.
- India is also a partner to the Himalayan initiatives along with other Himalayan countries. A Himalayan initiative was recently endorsed by the Indian Government in 2008.
- Five GEF projects posed for external funding from UNEP and have been approved in principle.
- World Wetland Day -2011 was observed at Keoladeo National Park, Bharatpur under the chairmanship of Hon'ble MEF.
- An International Conference on Indian Ornithology by Salim Ali Centre for Ornithology and Natural History (SACON) was held from 19-23 November, 2011 at Coimbatore with the financial assistance provided by MoEF.
- Country Report for CoP-11 of Ramsar Convention has been finalised and is being sent to Ramsar Secretariat for the next CoP meeting to be held in July 2012 at Ramania.

- Two presentation on selected themes (i) Need for developing effective mechanism to monitor ecological interventions in Ramsar sites and (ii) Wetlands (Conservation and Management) Rules -2010 were sent to Ramsar for discussion during Ramsar Pre CoP-11 Asian Regional Workshop held from 14<sup>th</sup> to 18<sup>th</sup> November, 2011 at Jakarta, Indonesia which were basis on the themes selected from a few Asian countries where some innovative measures have been initiated for conservation of wetlands.

### Comparison of progress vis-à-vis that achieved in the previous years

- Total number of identified wetlands has increased to 115 in 2010 covering 24 states and two UTs. Five more wetlands have been recommended for inclusion in the list by the Expert Group on wetlands in the meeting held in the Ministry. These wetlands will be added to the list after the endorsement by the CWRA.
- During 2011-12 one workshop was organized at Leh Ladakh (J&K) for providing training to wetland managers dealing with high altitude Ramsar Sites.
- Funds were released to concerned organizations for eight research projects including ongoing projects.
- An additional grant of Rs. 3.00 crores has been proposed during 2011-12 for sanction of management action plan of identified wetlands.

### State wise status

One hundred fifteen wetlands covering 24 states and two UTs have been identified under the National Wetland Conservation programme and five more wetland have been recommended for inclusion in the list by the Expert Group on Wetlands.

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**Regulatory Acts/Rules governing the programme and promulgation of new acts, if any, along with the details:**

Ministry has notified Wetlands (Conservation and Management) Rules, 2010 under Part II, Section 3- Sub Section (i) of EP Act 1986, vide notification no. GSR-951(E) dated 4<sup>th</sup> December, 2010. The main provisions under the Rule are as below:

- Criteria for notifying the wetlands for regulation under the Rule.
- Prohibited activities in the notified wetlands.
- Regulated activities in the notified wetlands.
- Constitution of Central Wetlands Regulatory Authority.
- Process for identification of wetlands under different categories.

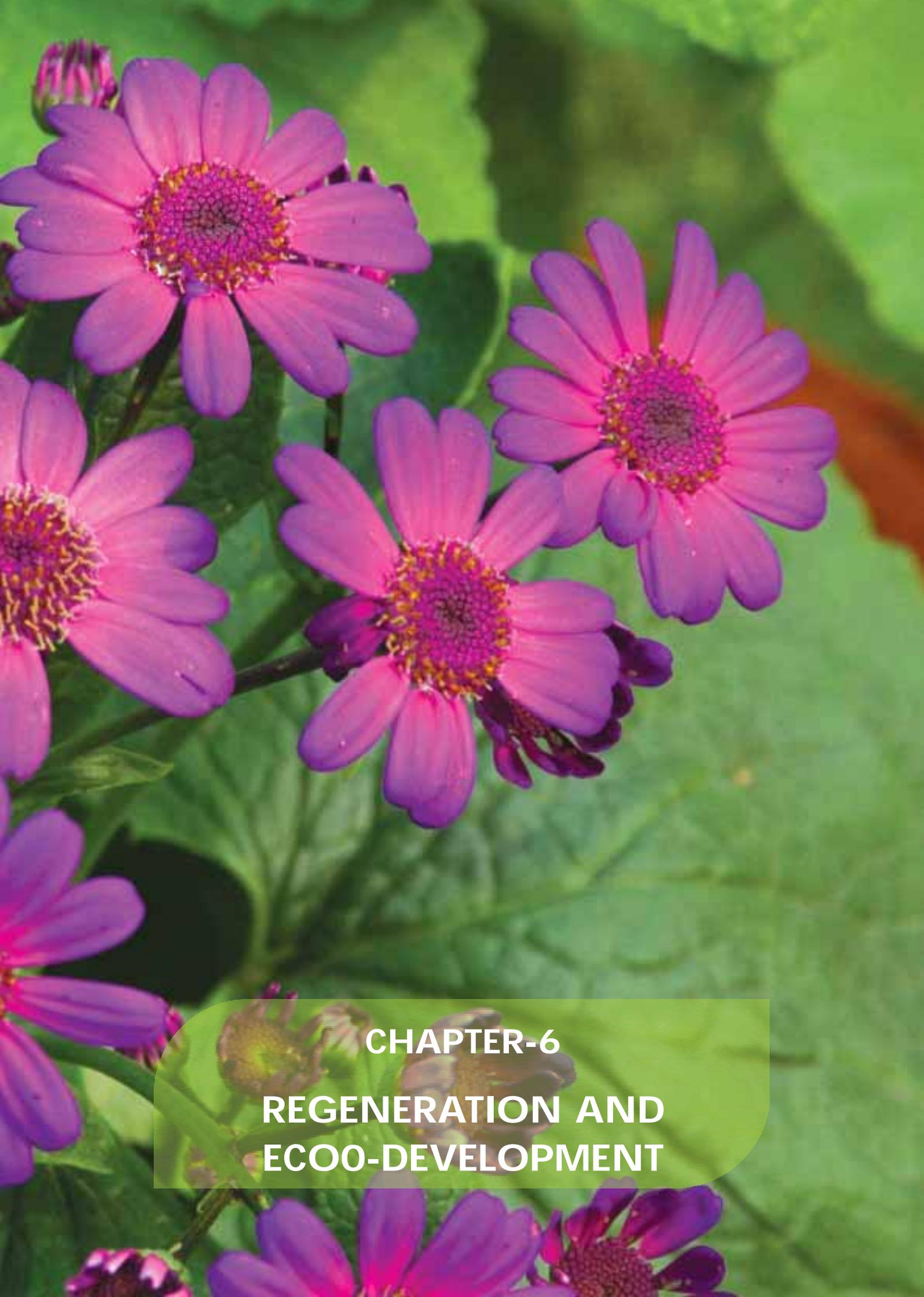
**Budget allocation of the scheme during the year and progress of expenditure**

An allocation of Rs. 11.90 crore has been made during the year 2011-12 for conservation and management of identified wetlands. So far an expenditure of Rs.10.34 crore has been incurred till 31<sup>st</sup> December, 2011.

An additional grant of Rs.3.00 crore has been proposed for wetlands during 2011-12.

**Implementation organizations**

Department of Environment and Forests, Department of Fisheries, Council for Science and Technology, State Wetland Authority of the concerned states are the nodal departments for implementing various conservation activities in states where wetlands have been identified under NWCP.



## **CHAPTER-6**

# **REGENERATION AND ECOO-DEVELOPMENT**

## National Afforestation and Eco-Development Board (NAEB)

### Introduction

In order to promote afforestation, tree planting, ecological restoration and eco-development activities in the country, the National Afforestation and Eco-Development Board (NAEB) was set up in August 1992. Special attention is also given by NAEB to the regeneration of degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protected areas as well as the ecologically fragile areas like the Western Himalayas, Aravallis, Western Ghats etc.

### Objectives

The detailed objectives of the NAEB are to:

- Evolve mechanisms for ecological restoration of degraded forest areas and adjoining lands through systematic planning and implementation;
- Restore, through natural regeneration or appropriate intervention, the forest cover in the country for ecological security and to meet the fuelwood, fodder and other needs of the rural communities;
- Augment availability of fuelwood, fodder, timber and other forest produce on the degraded forest and adjoining lands in order to meet the demands for these items;
- Sponsor research and extension of findings to disseminate new and proper technologies for the regeneration and development of degraded forest areas and adjoining lands;
- Create general awareness and help foster a people's movement for promoting afforestation and eco-development with the assistance of voluntary agencies, Non-Governmental Organizations, Panchayati Raj institutions and others and promote participatory and sustainable management of degraded forest areas and adjoining lands;

- Coordinate and monitor the Action Plans for tree planting, ecological restoration and eco-development; and
- Undertake all other measures necessary for promoting afforestation, tree planting, ecological restoration and eco-development activities in the country.

### Name of the Schemes

National Afforestation and Eco-Development Board (NAEB) operates the following three major schemes:

- (a) National Afforestation Programme (NAP) Scheme
- (b) NAEB Scheme: The major components of the Scheme are:
  - i. Grants in Aid for Greening India (GIA for GI) Scheme
  - ii. Monitoring and Evaluation (M&E)
  - iii. Communication
  - iv. Support to Regional Centres (RCs)
- (c) Eco Development Forces (EDF) Scheme

### (a) National Afforestation Programme (NAP) Scheme

#### Introduction and Objectives

It continues to be the flagship scheme of NAEB, in so much as it provides support, both in physical and capacity building terms, to the Forest Development Agencies (FDAs) which in turn are the main organs to move forward institutionalization of Joint Forest Management. The FDA has been conceived and established as a federation of Joint Forest Management Committees (JFMCs) at the Forest Division level to undertake holistic development in the forestry sector with people's participation. From the year 2010-11, State Forest Development Agency (SFDA) has been constituted at the State level to smoothen the fund flow to the FDAs. This decentralized three-tier institutional structure (SFDA, FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve

**Table-34.** Year-wise progress of National Afforestation Programme (As on 30.11.2011)

<b>Table : Year-wise progress of National Afforestation Programme (2002-03 till date)</b>				
Year	No. of New FDA projects approved	No. of New JFMCs involved	Project Area approved (ha.)*	Release (Rs. in crores)**
2000-02	47	1843	71068	47.53
2002-03	237	8197	404799	151.26
2003-04	231	7902	282536	207.98
2004-05	105	3404	106743	233.00
2005-06	94	2362	54432	248.12
2006-07	15	494	0	292.75
2007-08	53	3979	493061	392.95
2008-09	13	6598	173435	345.62
2009-10	5	7756	103556	318.17
2010-11 (as on 31.12.2010)	26 SFDA Projects	--	57126	309.99
2011-12 (as on 30.11.2011)	20 SFDA Projects	--	85648	100.53

\* Area approved for advance soil work/preparatory plantations during the year for all ongoing FDA projects.

\*\* Total (financial assistance provided during the year for planting, advance soil work, maintenance, etc.) for all ongoing FDA projects

forests and livelihoods of the people living in and around forest areas. The village is reckoned as a unit of planning and implementation and all activities under the programme are conceptualized at the village level. The three-tier approach, apart from building capacities at the grassroots level, significantly empowers the local people to participate in the decision making process. Under Entry Point Activities, community assets are created with a 'care and share' concept. The objectives of the scheme are as follows:

- Protection, and conservation of natural resources through active involvement of the people.
- Checking land degradation, deforestation and loss of biodiversity
- Ecological restoration and environmental conservation and eco-development
- Evolving village level people's organization which can manage the natural resources in and around villages in a sustainable manner
- Fulfillment of the broader objectives of productivity, equity, and sustainability

- for the general good of the people
- Improve quality of life and self-sustenance aspect of people living in and around forest areas
- Capability endowment and skill enhancement for improving employability of the rural people.

#### Progress and Achievements during the year

- Eight hundred (800) FDA projects have been operationalised so far, since the launch of the FDA mechanism in 2000-01, at an expenditure of Rs. 2647.86 crores to treat a total area of 18.32 lakh ha. (as on 30<sup>th</sup> November, 2011). Rehabilitation of shifting cultivation lands have been given specific focus under the programme, and so far, thirty five jhum projects have been sanctioned in North-Eastern (NE) States and in Orissa.
- As on 30<sup>th</sup> November, 2011, Rs.100.53 crore was released to State Forest Development Agencies (SFDA) during the year 2011-12 for implementation of National Afforestation Programme (NAP).

### Implementing organization

The NAP Scheme is implemented through three-tier decentralized mechanism of State Forest Development Agency (SFDA) at State level, Forest Development Agency at Forest Division Level and Joint Forest Management Committees (JFMCs) at the village level.

### Comparison of progress as compared to previous years

Year-wise and State-wise progress of National Afforestation Programme in the Tenth Five Year Plan and during the current year is given in Table-34 and Table-35 respectively.

**Table-35.** State-wise status of FDA projects since inception of the scheme (2000-02) till 31.3.2010.

Sl. No.	Name of State/Union Territory	No. of FDA Projects/ Proposals sanctioned	Total project cost (in Rs. crores)	Total JFMCs	Area (in ha.)	Total Releases (in Rs. Crores)
1	Andhra Pradesh	47	130.74	2555	72823	84.67
2	Chhattisgarh	32	225.56	2611	106660	158.51
3	Gujarat	25	212.02	2157	82530	127.38
4	Haryana	19	128.35	2265	44189	102.22
5	Himachal Pradesh	30	81.82	1556	44883	58.73
6	Jammu & Kashmir	31	109.69	1836	65494	55.28
7	Karnataka	45	212.36	1560	96155	157.84
8	Madhya Pradesh	55	208.30	3270	124782	142.98
9	Maharashtra	48	205.03	3092	119227	134.69
10	Orissa	46	157.69	3547	123307	105.99
11	Punjab	15	38.07	1192	18109	21.91
12	Rajasthan	33	67.52	996	45490	49.46
13	Tamil Nadu	32	130.83	1580	68192	101.73
14	Uttar Pradesh	69	241.21	2752	130127	193.23
15	Uttarakhand	38	98.33	1900	65576	72.34
16	Goa	3	2.39	26	1250	0.64
17	Jharkhand	34	160.50	2495	96500	118.09
18	Bihar	10	45.12	978	28481	34.12
19	Kerala	27	87.31	615	31981	45.58
20	West Bengal	20	67.48	1960	38248	46.16
	<b>Total (Other States)</b>	<b>659</b>	<b>2610.34</b>	<b>38943</b>	<b>1404004</b>	<b>1811.57</b>
21	Arunachal Pradesh	23	40.93	481	30321	25.69
22	Assam	30	84.36	810	52605	65.51
23	Manipur	16	67.91	578	35144	54.80
24	Nagaland	19	71.12	456	43718	62.78
25	Sikkim	8	65.95	244	26003	54.60
26	Tripura	13	41.00	271	29470	29.79
27	Mizoram	24	124.57	528	50120	106.70
28	Meghalaya	8	32.06	224	18245	25.91
	<b>Total (NE States)</b>	<b>141</b>	<b>527.90</b>	<b>3592</b>	<b>285626</b>	<b>425.79</b>
	<b>TOTAL</b>	<b>800</b>	<b>3138.24</b>	<b>42535</b>	<b>1689630</b>	<b>2237.36</b>

**Table-36.** State-wise status of SFDA projects (from 1.4.2011 to 30.11.2011)

S.No.	State	Total Approved Amount	Total Release Amount	Approved Advance Work
		(Rs. In lakh)		(in hectares)
1	2	3	4	5
1	Andhra Pradesh	3539.88	1807.5	7794
2	Bihar	1342.79	811.71	5647
3	Chhattisgarh	5431.51	4231.5	5637
4	Gujarat	5905.15	3785.09	9185
5	Haryana	3943.72	3031.99	4245
6	Himachal Pradesh	1467.49	695.01	4212
7	Jammu & Kashmir	1048.92	398.61	0
8	Jharkhand	1981.96	873	0
9	Karnataka	2593.13	1152.15	5765
10	Kerala	2073.68	948.13	3633
11	Madhya Pradesh	6740.4	3256.64	17565
12	Maharashtra	5914.08	2395.13	3899
13	Orissa	2878.59	1434.15	7410
14	Rajasthan	1868.4	933.24	3700
15	Tamil Nadu	1336.31	1028.68	2984
16	Uttarakhand	1169.14	447.11	3340
17	Uttar Pradesh	4463.84	2943.73	11374
18	West Bengal	1161.42	669.63	5175
	<b>Sub Total :</b>	<b>54860.41</b>	<b>30843.00</b>	<b>101565</b>
19	Arunachal Pradesh	701.31	552.00	3125
20	Assam	1240.44	607.87	0
21	Manipur	2021.8	1528.88	5544
22	Meghalaya	954.06	878.76	4800
23	Mizoram	2558.82	1878.18	4970
24	Nagaland	1846.59	1426.61	6500
25	Sikkim	2254.42	1623.74	3779
26	Tripura	2885.98	1710.97	12491
	<b>Sub Total :</b>	<b>14463.42</b>	<b>10207.01</b>	<b>41209</b>
	<b>Grand Total</b>	<b>69323.83</b>	<b>41050.01</b>	<b>142774</b>

### New initiatives under the Scheme

A number of initiatives have been taken by the Ministry to expedite the implementation of the scheme as well to improve the qualitative aspects of implementation. These include:

- Stepping-up monitoring and evaluation of the FDA projects by activation of State-level Coordination Committees for NAP, increased field visit by officers, and expeditious commissioning by the States of first independent concurrent evaluation of FDA projects
- Increased number of training programmes for the frontline staff and JFM committee members
- Organising district -level interdepartmental linkage workshops for promoting linkage of NAP with other developmental programmes for enhancing the sustainability of JFM
- Initiating pilot projects for establishing forest-based microenterprises which will provide experiential learning for scaling-up such activity with a view to consolidate the JFM during the Eleventh Plan.
- Comprehensive amendment in Guidelines of NAP scheme has been made to promote further decentralization by delegating more responsibilities to State Forest Departments with respect to processing of the FDA project proposals, greater organic linkage of JFMCs with Gram Panchayats, increased security of the elected members of JFMCs through longer tenure of JFMC presidency, capacity building in particular of frontline staff of Forest Department and JFMC members especially with regard to local management and administrative responsibilities.

### National Afforestation and Eco-Development Board (NAEB) Scheme

The major component of the scheme are :-

- i. Grants in Aid for Greening India (GIA for GI) Scheme
- ii. Support to Regional Centres (RCs)
- iii. Monitoring and Evaluation (M&E)
- iv. Communication

### Grants in Aid for Greening India Scheme

Increasing forest and tree cover (FTC) of the country to one-third of its geographical area, as envisaged in the National Forest Policy 1988, is essential for economic and ecological security of the country. Achieving the target of one-third of FTC, however, requires substantial increase in the annual tree planting rate in the country, and that too, mostly on lands outside recorded forest area (RFA) wherein non-forest organizations and the custodian institutions can play a significant role. The Scheme 'Grants-in-Aid Scheme providing assistance to Voluntary Agencies for tree planting' was started for encouraging participation of the interested Non-Governmental Organisations as well as Government Institutions.

It has been observed that for raising tree plantations on lands outside forest cover, economic return is the major driving force. These could be encouraged if returns to the growers were made attractive. The wanting economic returns are largely attributed to the low volume and poor quality yield of tree products. The main reason for this is that the tree growers do not have easy access to quality planting material (QPM) due to both paucity of QPM production facilities in the rural areas and low awareness about gains of using QPM. Recognizing these constraints, the then Grants-in-Aid Scheme was restructured by incorporating additional components of QPM production facilities and creation of mass awareness about QPM. This was renamed as "Grants in aid for Greening India" Scheme and three aspects expressly stated:-

- a) Raising mass awareness about QPM and tree planting
  - b) Enhancing the capacity for QPM production
  - c) Tree planting with people's participation
- "Grants in Aid for Greening India" Scheme has been discontinued w.e.f. 2008-09. The ongoing projects, however, will continue to be supported till completion.

**Table-37.** Progress under the previous 'Grants-in-Aid to Voluntary Agencies' and present Grants-in-Aid for Greening India' Scheme

Year	No. of tree planting projects supported *	Expenditure (Rs. in Cr.) **
2002-03	141	4.00
2003-04	251	8.49
2004-05	266	8.97
2005-06	211	11.76
2006-07	109	5.86
2007-08	129	8.48
2008-09 ***	85	3.95
2009-10***	29	1.05
2010-11***	7	0.38
2011-12	Nil	Nil

\* Includes ongoing projects, sanctioned in previous years also.

\*\* Includes grants given for Awareness Generation, High-Tech Nursery and Tree Planting components of the Grants in Aid for Greening India Scheme.

\*\*\* Includes only ongoing projects as no new project was sanctioned.

Financial assistance of Rs.0.38 crores was provided to agencies for ongoing tree planting projects during financial year 2010-11. The Budget Estimate for ongoing projects under the Scheme for 2011-12 is Rs.0.50 crore. The requisite reports/certificates from the voluntary agencies/FDAs are being pursued by the Ministry. Due to pendency of adequate reports, no further release of funds have been done in the current financial year.

Table-39 reflects the number of projects for tree planting supported under the previous 'Grants-in-Aid to Voluntary Agencies' scheme (until 2004-05) and the present 'Grants-in-Aid for Greening India' Scheme till the current financial year 2010-11.

The scheme is being implemented by Government Departments, Urban Local Bodies, Panchayati Raj Institutions, Public Sector Undertakings, Autonomous Bodies, Registered Societies, Non-Profit Organizations, Cooperatives, Charitable Trusts, Voluntary Agencies, Registered Schools, Colleges, Universities and State Forest Departments. Voluntary Agencies are

implementing majority of Tree Planting projects.

### Regional Centres of NAEB

The Board has designated seven Regional Centres in various universities/ national level institutions - Dr. Y.S.Parmar University of Agriculture, Solan, Himachal Pradesh, University of Agricultural Science, Bangalore, Indian Institute of Forest Management, Bhopal, Jadavpur University, Calcutta, Agricultural Finance Corporation, Mumbai, Agricultural Finance Corporation, Delhi, North Eastern Hill University (NEHU) Shillong. These Centres help NAEB in promoting extension of replicable technologies and for dissemination of research findings. They provide technical and extension support in effective implementation of regeneration of degraded forests and adjoining lands with people's participation and also act as a forum for the exchange of ideas and experiences amongst the States of the region as well as across the regions. In addition, these Centres carry out problem-specific studies as well as evaluation of NAEB's programmes in the field and

organize training programmes and workshops focusing on priorities set out by the Board.

The work programmes of the Regional Centres are formulated to address the emerging needs of promoting sustainability of Joint Forest Management beyond the NAP scheme funding. The new areas include training for forest-based micro-enterprises, development of Joint Forest Management Committees, Self Help Groups, district-level inter departmental linkage workshops for synergy of JFM with other schemes of Government and studies on improved silvicultural practices for management of non-timber forest products. Pilot projects on capacity building for forest based micro-enterprise have been initiated by the Regional Centres across the country. It is hoped that based on the experience of these pilots, the forest-based microenterprise could be scaled-up as a means of promoting sustainable livelihoods of the forest-fringe communities.

### Monitoring and Evaluation (M&E)

It is proposed to undertake evaluations of the ongoing projects and scheme of NAEB in order to assess achievement against the set objectives, as well as evaluating strengths and weaknesses of various technologies used so that appropriate amendment in the current schemes of NAEB could be made for greater efficiency.

It is also proposed to continue with:

- (a) First concurrent evaluation of SFDA projects under NAP Scheme;
- (b) Study of tree planting under 20-Point Programme in selected districts of India;
- (c) Interactive meetings on Monitoring and Evaluation of SFDA projects under NAP at regional level

A sum of Rs. 1.00 crores is the budgetary outlay of 2011-12. No funds have been released so far. It is expected to fully utilize the allocated budget.

### Communication

New technology and methodologies of participatory management, eco-development

and regeneration of degraded forests are being progressively developed. In order to share such experiences and technologies widely, NAEB documents such information, brings out publications, and also documents success stories. In order to increase the forest and tree cover, an aggressive media campaign has been launched in twelve districts of six selected States of Bihar, Gujarat, Rajasthan, Karnataka, Uttar Pradesh and West Bengal. This includes print publicity, advertisements, audio spots, audio-visual spots and TV commercials in regional and local languages to generate a mass movement.

During 2011-12 an amount of Rs. 2.30 crores has been provided as the outlay for various items under Communication out of which Rs. 0.22 crores has been released upto 31<sup>st</sup> October, 2011. It is proposed to significantly scale-up this activity during 2012-2013 through preparation and implementation of a structured Media Plan for tree planting on non-forest lands by private individuals and institutions. A multi media campaign will be run through Directorate of Advertising and Visual Publicity (DAVP) and will be in the regional languages to bring focused efforts on raising awareness on benefits of tree planting.

### Eco-Development Forces (EDF) Scheme

Eco-Development Forces Scheme was established in 1980s as a scheme being implemented through Ministry of Defence for ecological restoration of terrains, rendered difficult either due to severe degradation or remote location or difficult law and order situation. The scheme of Eco-Development Forces is based on twin objectives of ecological regeneration in difficult areas, and promotion of meaningful employment to ex-servicemen.

Under this scheme, the establishment and operational expenditure on the Eco Task Force (ETF) Battalions raised by Ministry of Defence is reimbursed by Ministry of Environment and Forests while the inputs like sapling, fencing, etc. and also the professional

**Table-38.** The progress of ETF Battalions during the year 2010-11 (as on 31<sup>st</sup> March, 2011)

Battalion	Location	New Plantation during the year (As on 31.03.2011)		Maintenance of old Plantation (As on 31.03.2011)	
		No. of Plants	Area in ha.	No. of Plants	Area in ha.
127 Inf Bn (TA) Eco	Uttarakhand	4.69 lakh	400	17.14 lakh	1600
128 Inf Bn (TA) Eco	Rajasthan	4.80 lakh	600	7.66 lakh	1170
129 Inf Bn (TA) Eco	Jammu & Kashmir	1.70 lakh	295	0.42 lakh	540
130 Inf Bn (TA) Eco	Uttarakhand	5.00 lakh	500	15.63 lakh	1500
134 Inf Bn (TA) Eco	Assam	10.56 lakh	1065	2.75 lakh	2407
135 Inf Bn (TA) Eco	Assam	8.43 lakh	844	5.08 lakh	508
	<b>TOTAL</b>	<b>35.18 lakh</b>	<b>3704</b>	<b>48.68 lakh</b>	<b>7725</b>

and managerial guidance is provided by the State Forest Departments. In ETF battalions, the Ministry of Defence deploys its ex-servicemen, preferably from within the area of operation, whereas the nuclear core of the force is constituted of regular servicemen. Some of the ETF Battalions have undertaken successful eco-restoration of highly degraded sites, for example the limestone mining areas in the Mussoorie Hills.

The progress of ETF Battalions during the year 2010-11 is given in Table-38.

Six ETF battalions are being supported under the Eco-Development Forces (EDF) Scheme in the States of Uttarakhand, Rajasthan, Jammu & Kashmir and Assam. Budget Estimate for the scheme during 2011-12 is Rs. 12.00 crores out of which Rs. 11.88 crores has been reimbursed to Ministry of Defence till 30<sup>th</sup> November, 2011.

The progress of ETF Battalions during the year 2011-12 is given in Table-39.

All ETF Battalions have undertaken works like raising nursery and plantation and protection measures to protect the plantation area. They have also constructed stone dams and also other soil and moisture conservation works.

### Implementing Organization

Directorate General of Territorial Army, Ministry of Defence, New Delhi.

### Green India Mission

Green India Mission (GIM) has been initiated by the Ministry of Environment & Forest as one of the eight missions under National Action Plan on Climate Change (NAPCC) The mission has been approved by the Prime Minister's Council on Climate Change on 22<sup>nd</sup> February and an amount of Rs.200 crores have been allocated in the budget for the preparatory activities in the year 2011-12 in the union budget for the year 2011-12. Total Mission cost is Rs. 46,000 crore over ten years starting from the year 2012-13, coinciding with the 12<sup>th</sup> and 13<sup>th</sup> Five year Plan Period. The Mission aims to increase forest and tree cover on five million hectare area and to improve quality of forest cover on another five million hectare area as well as to improve ecosystems services, forest based livelihood income of about three million households and to enhance annual CO<sub>2</sub> sequestration.

### Progress made so far

- A Brainstorming Session on sensitising

**Table-39.** The progress of ETF Battalions during the year 2011-12 (as on 30<sup>th</sup> September, 2011)

Battalion	Location	New Plantation during the year (As on 30.09.2011)		Maintenance of old Plantation (As on 30.09.2011)	
		No. of Plants	Area in ha.	No. of Plants	Area in ha.
127 Inf Bn (TA) Eco	Uttarakhand	4.00 lakh	400	2.01 lakh	1200
128 Inf Bn (TA) Eco	Rajasthan	5.60 lakh	700	14.27 lakh	1470
129 Inf Bn (TA) Eco	Jammu & Kashmir	1.08 lakh	140	5.75 lakh	693
130 Inf Bn (TA) Eco	Uttarakhand	5.00 lakh	500	0.91 lakh	500
134 Inf Bn (TA) Eco	Assam	8.81 lakh	774	17.83 lakh	1887
135 Inf Bn (TA) Eco	Assam	9.30 lakh	930	8.44 lakh	844
	<b>TOTAL</b>	<b>33.79 lakh</b>	<b>3444 ha.</b>	<b>49.21 lakh</b>	<b>6594 ha.</b>

State Forest Departments/ other Stakeholders on Green India Mission (GIM) and list of actions to be taken with timeline was organized on 26<sup>th</sup> March, 2011 at New Delhi.

- A workshop on the criteria for identification of the landscapes under GIM and prioritizing them for implementation was organized on 28<sup>th</sup> and 29<sup>th</sup> of April, 2011 at New Delhi and two groups have been constituted for formulating criteria for land scape identification and operational guidelines.
- Four regional workshops on Operational Guidelines for implementation of GIM have been conducted at Jabalpur (7<sup>th</sup> October, 2011), Jaipur (11<sup>th</sup> October, 2011), Agartala (15<sup>th</sup> October, 2011) and Bengaluru (20<sup>th</sup> October, 2011).
- Draft Cabinet Note on GIM was circulated to concerned Ministries/ Departments for their comments. The received comments were compiled and response of the MoEF was prepared. After internal discussions in the ministry, draft EFC proposal and draft CCEA note are being prepared.
- Constitution of Steering Committee of the Green India Mission is under process. It has been decided in the Ministry to circulate approach paper on GIM funding to the various ministries, before CCEA note/EFC proposal is circulated to the appropriate Ministries for comments. An approach paper on convergence issues for implementation of GIM has been circulated on 17<sup>th</sup> November, 2011 to the concerned Ministries/Department/ Organisation for their comments.
- Proposal for Rs. 200.00 crores for operationalizing and implementation of preparatory activities has been submitted to Inter Ministerial Group (IMG). The proposal has been circulated by Ministry of Finance (PF-II) to relevant ministries with last date of 27<sup>th</sup> September, 2011 for comments. As suggested by PMO, an IA is under process for filing in the Supreme Court for additional allocation from CAMPA funds. The proposal for Rs.200 crores from National Clean Energy Fund has been apprised in the meeting of Inter-Ministerial Group (IMG) convened by the Ministry of Finance, Department of Expenditure on 25<sup>th</sup> November, 2011.
- The first advisory guidelines for implementation of GIM have been circulated to all States on 21<sup>st</sup> November, 2011.

**CHAPTER-7**  
**RESEARCH**



## Environmental Research

### Research and Development (R&D)

#### Introduction

The Ministry of Environment and Forests, is classified as a 'Scientific Ministry' under the Government of India. Since its inception in 1985, the Ministry has been funding research through Grant-in-Aid projects in the identified thrust areas to various organizations (universities, colleges recognized by UGC, institutions of CSIR, ICAR, ICMR, ICSSR and recognized non-governmental scientific organizations) all over the country in different areas under the broad ambit of environment protection and management. The Ministry has brought out Guidelines for Support to Environmental Research in the year 2006. The Ministry has taken a number of new initiatives to strengthen scientific research in the area of environmental sciences. Some of these include institution of National Environmental Sciences Fellows Programme, Mahatma Gandhi Chair in Ecology and Environment etc.

#### Objectives

- To generate information and knowledge required for developing strategies, techniques and methodologies for better environmental management.
- To find practical solutions to problems of environment protection and management (eg. Eco-regeneration of degraded areas, management of plastic wastes, bioremediation of contaminated sites etc.).
- To build endogenous capacities and strengthen scientific manpower in multidisciplinary and emerging areas of environment and ecology.
- To promote development of infrastructure facilities, where necessary, for undertaking Environmental Research.
- To generate, document and analyze information for taking policy decisions relating to environment and natural

resources, including preparedness for international negotiations.

- To support basic research which leads to applied research in the areas of environment and ecology with the aim of development of management and policy interventions
- To facilitate database management at one single point in the Ministry.

The vision of the R&D Scheme of the Ministry is "Promotion of research in various facets of ecology and environment for the conservation of environment and natural resources of the country" through its established research programmes. These include Environment Research Programme (ERP), Ecosystem Research Scheme (ERS), Eastern and Western Ghats Research Programme (E&WGRP) and Economic & Social Issues. Thematic Expert Groups for these research programmes have been constituted to screen evaluation and recommend new projects and also to monitor/review the ongoing projects. The Ministry also promotes research in Environment through the awards of National Fellowships and chairs to the outstanding Scientists. These fellowship awards include Pitambar Pant National Environment Fellowship Award in Environmental Science and Dr. B.P. Pal National Environment Fellowship Award for Biodiversity, National Environmental Sciences Fellows Programme and Mahatma Gandhi Chair. The details of these fellowships are given in the relevant chapter.

#### Programme-wise Progress and Activities

##### Environment Research Programme (ERP)

Environment Research Programme (ERP) deals with problems related to pollution and development of suitable cost effective technologies for abatement of pollution. Emphasis is laid on development of eco-friendly biological and other interventions for

prevention, abatement of pollution and development of strategies, technologies and instruments etc. for control of pollution. Projects are also encouraged for development of biodegradable plastics, to carry out epidemiological studies, strategies to reduce impact of mining, chemical pollution of soils, and hazardous substances including pesticides, heavy metals etc. Projects related to waste recycling and resource recovery from waste along with the development of eco-friendly and cleaner technologies are given priority. The projects are supported in the identified thrust area of environment research.

Under the Thematic Group 'Prevention, Abatement and Control of Pollution', three Programmes/Schemes are covered namely (i) Environment Research Programme (ii) National River Conservation and (iii) Climate Change/Clean Technologies. During the financial year seven meetings of the Thematic Expert Group were held to consider the new/ revised/ comments received on new proposals & to review/monitor the ongoing/completed projects. Total 149 proposals were considered by the Expert Group of which seventeen were recommended. Progress of 68 ongoing projects were reviewed and monitored, and on 66 proposals comments were received and considered during the year. Eleven new projects have been sanctioned during the period (Annexure -III). The Expert Group also reviewed the Final Technical Report (FTR) of completed projects during the period (Annexure-IV).

### **Ecosystem Research Scheme (ERS)**

Ecosystem Research Scheme is an interdisciplinary programme of research, which emphasizes ecological approach for studying the relationship between man and environment. The objective of the programme is to develop a basis within the field of natural and social sciences for rational use and conservation of resources for general improvement of the relationship between man and his environment. The programme seeks to provide a scientific

basis to solve the practical problems of resource management. The programme also seeks to provide a scientific knowledge and trained personnel needed to manage the natural resources in a rational and sustainable manner. Ecosystem studies become even more important as the Earth's environmental ecosystems are increasingly being affected at all levels. Ecological understanding and research in this area offer tangible hope for addressing extremely complex and potentially devastating assaults on local, regional and global ecosystems. Under the scheme, emphasis is laid on multi-disciplinary aspects of environmental conservation with emphasis on eco-system approach consistent with the identified thrust areas and orientation.

During the year under Ecosystem Research Scheme five new projects were initiated (Annexure-III) and 23 projects were reviewed.

### **Eastern and Western Ghats Research Programme (E&WGRP)**

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. 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 E&WGRP four new project was initiated (Annexure-III), one study was completed (Annexure-IV) and 10 projects were reviewed.

### **Thematic Group on 'Economic & Social Issues relating to Environment'**

The Thematic Expert Group 'Economic & Social Issues relating to Environment' would consider all proposals related to Cost Benefit Analysis, Socio-economic, policy related issues and other miscellaneous issues. During the year one new project was initiated, one study was completed and 10 projects were reviewed.

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During the year 2011-12 one meeting was organized under the Thematic Expert Group on 'Economic & Social Issues relating to Environment'. Two ongoing projects were reviewed, 15 new / revised projects were considered and one project was recommended for funding.

### **New Institutions - National Environment Protection Training & Research Institute (NEPTRI)**

The proposal for conversion of existing Environmental Protection Training and Research Institute (EPTRI), Hyderabad into a National level institute to be named as National Environment Protection Training and Research Institute (NEPTRI) as Joint venture between Government of India and Government of Andhra Pradesh is under active consideration. The in-principle approval of Planning Commission has been obtained subject to certain conditions. The Detailed Project Report (DPR) for the upgradation of EPTRI to NEPTRI has been prepared and memo for Standing Finance Committee (SFC) for the same is under consideration.

### **Identification of New Thrust / Priority Areas and New Initiatives under R&D Scheme**

#### **Revision of Guidelines for Support to Environmental Research**

The proposed revised "Guidelines for Support to Environmental Research" *inter alia*, provide details on type of research projects which would be sponsored by the Ministry, broad thrust areas of research, eligibility criteria, scope and coverage of research grants, criteria for selection of projects, concept of public private partnership in R&D projects, procedure for invitation, submission, appraisal, monitoring and review of research project alongwith norms of funding. The Guidelines also include the terms and conditions governing research grants.

The guidelines aim to provide scientific impetus to the R&D efforts of the Ministry and

address new and emerging environmental challenges. The revised Guidelines also provide a framework to make research in the areas of environment and ecology more productive by emphasizing on outputs and outcomes.

### **State of the Art Report on Bioremediation of Contaminated sites in India**

The Ministry had commissioned a 'State of the Art Report on Bioremediation of Contaminated sites in India', which has been prepared by Professor M.N.V. Prasad, Department of Plant Science, University of Hyderabad. The report has been published and was released by the then Hon'ble MoS (I/C) Shri Jairam Ramesh. The State of the Art Report has been put on the Ministry's website for wider dissemination.

### **Western Ghats Ecology Expert Panel (WGEEP)**

The Western Ghats Ecology Expert Panel (WGEEP) under the Chairmanship of Prof Madhav Gadgil was 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. The Panel also was to recommend the modalities for the establishment of Western Ghats Ecology Authority under Environment (Protection) Act, 1986. The Panel has submitted its report to the Ministry.

### **Financial Progress for Year 2011-12**

The total allocation for R&D Scheme during 2011-12 is 10.0 crores. The entire amount would be utilized for ongoing and new projects based on the recommendations of the Thematic Expert Groups. Funds have also been utilized for final settlement of accounts for completed projects during current financial year 2011-12, in addition to the

ongoing programmes in the area of Research in Environment under the R&D scheme.

**Summaries / Research findings of some of the Projects completed during the year 2010-11.**

**Ecology of Plant Galls in the Shola Forests of Eastern and Western Ghats of Tamil Nadu (FTR) by Dr. S. Amerjothy, Deptt. of Plant Biology and Plant Biotechnology, Presidency College, Chennai- 600 005.**

Eleven forest areas were explored during a period of two years. During this period, about 127 galls were recorded among which 27 galls turned to be new records. The gall bearing plant species were 104 belonging to 72 genera and 50 families. Among the species recorded, two belong to pteridophytes and one Gymnosperm.

The survey provided many exciting results and many of the results were of high contributory values in the area of plant galls and gall insects ecology, pharmaceutical values, industrial applications and academic vistas. The floristic composition of shola forests is highly complex and their vegetational profile is also very high. Because of highly conducive ecological factors, the shola forests harbour dense and rich plant species on which quite a large number of phytophagous insects, especially gall inciting organisms, rely for their food and shelter.

**Pesticide degradation using cultural and biological tools to minimize ground water pollution by Dr. Anjana Srivastava, Department of Chemistry, College of Basic Science & Humanities, G.B. Pant University of Agriculture & Technology, Pantnagar -263145, Uttarakhand.**

Soil microflora from agricultural fields where chlorpyrifos and lindane pesticides regularly used were screened and isolated for their specific in vitro capacity to degrade the selected pesticides. A pilot study was also

carried out with maize and rice cropped lysimeter to demonstrate effect of application of soil amendment and later addition of microbial consortia culture on residue level of chlorpyrifos and lindane pesticides in the percolated water, surface and subsurface soil and also in the crop.

It was found that a microbial consortia of *Bacillus* sp. and *Pseudomonas* sp. was effective in degradation of chlorpyrifos. Similarly a microbial consortium of *Gordonia* spp. was effective in degradation of lindane.

**Development of luminescence based Biosensors for the detection of mercury ions in water bodies by Dr. Arif Ali, Department of Biosciences Faculty of Natural Sciences, Jamia Millia Islamia, Maulana Mohammed Ali Jauhar Marg, New Delhi-110025, Delhi.**

Present work was conceded to construct the sensitive bacterial biosensor by selecting highly mercury resistance *E. coli* strains regulatory gene fused with promoter less *lux* genes, which evaluates the real time data of inorganic mercury in polluted and non polluted water bodies without labour-intensive and less time consuming sample preparations.

The data generated in this research demonstrates that the biosensor is potentially useful for the evaluation of environmental water samples and pollution management. It has also been proposed that the biosensors developed in this study should be used as a first line of detection for the presence of mercury pollution in water and wastewater.

**Controlled catalytic systems: A Viable option for development of cleaner chemical process by Dr. Subratnath Koner, Department of Chemistry, Jadavpur University, Kolkata-700032, West Bengal.**

In this project quite a few heterogeneous catalysts have been successfully prepared that catalyzed industrially important reactions

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according to plan. Catalysts have demonstrated desired product selectivity in catalytic reactions. As the reaction is undergone in heterogeneous condition the catalysts can be recovered and recycled many times without any loss of catalytic activity. No leaching of metal was observed during reaction. Therefore, the process is energy saving (as these are catalytic), atom efficient, produce less amount of waste and economical. Nevertheless, the project has enriched the knowledge-base of viable industrially important catalytic processes

### National Natural Resource Management System (NNRMS)

The scheme National Natural Resources Management System (NNRMS) of the Ministry is a part of an umbrella scheme of the Planning Commission – Planning Committee – National Natural Resources Management System (PC-NNRMS) which involves utilization of remote sensing technology for accurate inventory of resources such as land, water, forests, minerals, oceans, etc. and to utilize this information for monitoring changes in ecological system. A Standing Committee on Bio-resources and Environment (SC-B) has been constituted by the Planning Commission under the Chairmanship of Secy. (E&F) with the following objectives:

- Optimal utilization of country's natural resources by a proper and systematic inventory of resource availability.
- Reducing regional imbalances by effective planning and in tune with the environmental efforts
- Maintaining the ecological balance with a view to evolve and implement the environmental guidelines.

The Standing Committee on Bio-resources and Environment (SC-B) advises on the methods of using the remote sensing technology for optimal use and management of natural resources in the country. In order to streamline the projects the SC-B has constituted a

Technical & Financial Sub-Committee to scrutinize/review all the proposals submitted for funding under NNRMS scheme from the technical and financial angle. The NNRMS SC-B considers only those proposals recommended by the Technical and Financial Sub-Committee and approves them for funding.

### Achievements during the 2011-12

- Organised One Meeting of Technical and Financial Sub-Committee of the National Natural Resource Management System on Bio-resources and Environment (NNRMS SC-B) during the year 2011-12 and considered nine (9) new / revised projects out of these three were reviewed and five Final Technical Report (FTR) were accepted of the completed projects (Annexure-IV).
- A project on using digital IRS LISS III data of post and pre-monsoon seasons (2006-07), for National Wetland Inventory and Assessment at 1:50,000 scale has been completed. The work involved preparation of State-wise wetland atlases, creation of digital database in GIS environment, development of query shell for information retrieval. The information generated under this project would be very useful to the ministry for conservation and management of wetlands. This is the first time, such atlases have been prepared on the basis of satellite imagery, in a systematic manner. The maps categorizes wetlands into 19 different classes, and are being made available at a 1:50,000 scale resolution.
- A national project on 'Snow and Glacier Studies' executed by the Space Application Centre in collaboration with 14 research organizations and academic institutions of the country sponsored by the Ministry has been completed. Snow cover for the entire Indian Himalaya has been monitored for four consecutive years

starting from 2004-05. Inventory of the glaciers carried out on 1:50,000 scale reveals the total no. of glaciers to be 32,392 with a total glaciated area of 71,182 Sq. Kms. More than two thousand glaciers have been monitored to study the advances/ retreat of their extent. Glacier mass balance based on accumulation area ratio method has also been studied.

- National Wetland Information System and National Coastal Zone Information System in GIS Platform has been developed and is being extensively used in implementation of wetland and CRZ notifications.
- A GIS based Decision Support System for Snow and Glaciers has been developed by SAC, Ahmedabad.
- A National Workshop on GIS has been organized by the Planning Commission to discuss on 14<sup>th</sup> September, 2011 to discuss Geo-spatial data generated through various projects under NNRMS Scheme. In fact, the version 2.0 document of National Geographic Information System (NGIS) depicts the importance of NNRMS as a data source for NGIS. The geo-spatial data generated/being generated under SC-B of NNRMS would become a valuable source for NGIS.
- The progress of the NNRMS Schemes is being reviewed annually by the PC-NNRMS under the Chairmanship of Member (Science), Planning Commission. The last review meeting was held on 18<sup>th</sup> July 2011 in New Delhi. The Ministry made a presentation on Achievement and Thrust Areas of SC-B in the said meeting. The PC-NNRMS has viewed the progress of NNRMS SC-B scheme very encouraging.

### Ecologically Sensitive Areas

Environmentally Sensitive Zones may be defined as areas with identified environmental

resources having "Incomparable Values" which require special attention for their conservation. The Ministry has already notified Ecologically-sensitive areas in respect of Matheran, Mahableshwar-Panchgani, Murud-Janjira, Mount Abu, Sultanpur and Dahanu Taluka under the Environment (Protection) Act, 1986. The Zonal Master Plan / Area Development Plan for all the notified / to be notified environmentally sensitive areas would be prepared by the concerned State Governments as per the provisions of the said respective notifications involving local communities / experts and shall be approved by the Ministry for regulating development activities and protection and conservation of Entities of Incomparable Values. Monitoring Committees with representatives of Government, Experts and local representatives as per the notifications would be constituted to ensure compliance of approved Zonal Master Plans / Area Development Plan. The achievements made during the year are as under:-

- The final notification published
  - Dandi, Gujarat
- Draft notifications published
  - Kalesar National Park, Haryana
  - Kalesar Wildlife Sanctuary, Haryana
  - Khol Hi Raitan Wildlife Sanctuary, Haryana
  - Bir Shikargarh Wildlife Sanctuary, Haryana
  - Nahar Wildlife Sanctuary, Haryana
  - Chhilchhila Wildlife Sanctuary, Haryana
  - Abubshaheer Wildlife Sanctuary, Haryana
  - Bhandawas Wildlife Sanctuary, Haryana
  - Khaparwas Wildlife Sanctuary, Haryana
  - Vasada National Park, Gujarat
  - Girnar Wildlife Sanctuary, Gujarat
  - Narayan Sarovar Sanctuary, Gujarat
  - Marine National Park and Marine Wildlife Sanctuary, Gujarat

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Fig-53. Shrubby vegetation near Leh, Jammu & Kashmir

- Purna Wildlife Sanctuary, Gujarat
- Bandipur National Park, Karnataka
- One hundred thirty five k.m. stretch of river Bhagirathi from Gaumukh to Uttarkashi as Eco-sensitive zone in Uttarakhand
- Proposal under consideration:
  - Shoolpaneshwar Wildlife Sanctuary, Gujarat
  - Marine National Park and Marine Wildlife Sanctuary, Gujarat
  - Balaram-Ambaji Wildlife Sanctuary, Gujarat

### **G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora**

#### **Introduction**

G.B. Pant Institute of Himalayan Environment and Development (GBPIHED) was established in August 1988 by the Ministry of Environment and Forests, Government of India, as an autonomous Institute, with a mandate of achieving sustainable development and environmental conservation in the Indian Himalayan Region (IHR). The Institute attempts to execute its

mandate through the Headquarters located at Kosi-Katarmal, Almora (Uttarakhand), and four regional Units located at Mohal - Kullu (Himachal Pradesh), Srinagar-Garhwal (Uttarakhand), Pangthang (Sikkim) and Itanagar (Arunachal Pradesh). The Institute designs and implements R&D activities on priority environmental problems; develops and demonstrates best practices and delivers technology packages for improved livelihood options for the

people of IHR. The identified thematic categories for Institute R&D activities include: (1) Watershed Processes and Management (WPM), (2) Biodiversity Conservation and Management (BCM), (3) Environmental Assessment and Management (EAM), (4) Socio-economic Development (SED), (5) Biotechnological Applications (BTA), and (6) Knowledge Products and Capacity Building (KCB). The projects sites, spread over different parts of IHR, have been selected carefully keeping in view the biophysical heterogeneity and location-specific needs of the inhabitants. All activities are need-based, target-oriented and time-bound. Research, demonstration and dissemination are underlying elements of all project activities geared towards development of environment-friendly technology packages. In addition GBPIHED also provides guidelines with policy implications.

#### **Objectives**

- The Institute has three broad objectives:
- To undertake in-depth research and development studies on environmental problems of the Indian Himalayan Region;
  - To identify and strengthen the local knowledge of the environment and

- contribute towards strengthening researches of regional relevance; and
- To evolve and demonstrate suitable technology packages and delivery systems for sustainable development of the region in harmony with local perceptions.

### Progress/Achievements made during the year

The achievements with wide range implications include the following:

- To mark International Year of Forests-2011, the Institute organized a Brain Storming Session on Forests focused on “Emerging Issues in Forestry Research in the Himalayan Mountains”, and a Brain Storming Workshop entitled “Quantification and Valuation of Forest Ecosystem Services: Focus on Nanda Devi Biosphere Reserve” (12-14<sup>th</sup> November, 2010).
- Global World Environment Day (G-WED) was celebrated under the theme “Forests: Nature at your service”; Institute through its HQs and four regional units organized month-long celebrations by way of several activities, e.g., a day with the Students-Awareness building program for school children; Jaiv-Vividhta Sanrakshan Avum Paryavaran Siksha Yatra; Himalayan Green School Award-Contribution towards mitigation of climate change; Hima-Paryavaran Mitra Krishak Award; Green March for Environmental Awareness; Various competitions, e.g., painting, poster, essay writing & cultural programmes; Compilation of folk songs in local languages, from IHR, in appreciation of nature, forests & the environment for creating awareness all across the IHR (May 5<sup>th</sup>- June 5<sup>th</sup>, 2011).
- A Children’s Expression and Discussion Session under the “Voice of the Children” program was organized across the IHR as a part of WED celebrations in collaboration with ICIMOD, Kathmandu-

Nepal under the Themes *Mountain People and Forests- Dependence and Responsibilities; and Forest Fire-causes.*

- Under the project ‘Kailash Sacred Landscape Conservation Initiative: Developing a Transboundary Framework for Conservation and Sustainable Development in the Greater Mt. Kailash Region of China, India, and Nepal’ attempts are being made to initiate and promote transboundary biodiversity and cultural conservation, ecosystem management, sustainable development, and climate change adaptation within the Kailash Sacred Landscape (KSL). A Feasibility Assessment Report, Conservation Strategy document, and Comprehensive Environmental Monitoring Plan have been prepared. Expert consultation and Yatras (Landscape Journeys) have been conducted to deepen the understanding and reflection on larger public opinion regarding the proposed activities of the programme. As an outcome, a five year plan for implementation phase is being developed.

### Research and Development Achievements

#### Group 2: Watershed Processes and Management (WPM) & Knowledge Products and Capacity Building (KCB)

Watershed Process and Management (WPM) and Knowledge Products and Capacity Building (KCB) are two major thematic thrusts of this group. Through its WPM theme, group focuses on studies of ecosystem processes operational at the watershed level, including the involvement of user groups and upstream-downstream linkages, with an overall aim of strengthening of mountain specific resource management practices using a systems approach. The KCB theme conducts activities that lead to enhancement of Institutional outreach, based on its research products such as state-of-the-

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art methodologies/approaches, models, policy briefs, etc. Achievements of this group include:

- In order to assess the hydrological responses in Kosi watershed, water demand forecast show that at low consumption rates (40LPCD) demand will increase from 4.96 to 6.3 MLD by the year 2030. At medium consumption (51 LPCD) demand will increase from 6.32 to 7.95 MLD by 2030. Low demand satisfaction indicates conservative use of water whereas high demand satisfaction indicates high use of water with improved socio-economic condition. The flow duration curve of Kosi for water in 2009-10 is indicative of the changing flow pattern during the year. A large part of the year falls under dry weather and low flow conditions. Only about 10% time during the year the high flow conditions are observed. For almost 60% of the time the river flow is sustained by the base flow (Fig-54). The river flow at present demand level can supply for nearly 290 days in a year. The rise in demand by 2030 is expected to further increase the water shortage for nearly 145 days in a normal rainfall year.

- By analyzing leaf energy of 20 multipurpose trees under the ecorestoration programme revealed that most of the energy absorbed by the 'undertemperature' plants was lost from the leaves by re-radiation and transpiration whereas in 'overtemperature' plants the absorbed energy was lost from the leaves by re-radiation, transpiration and convection of heat; the results obtained on total leaf energy absorption revealed lowest amount of energy absorption by the leaves of *Aesculus indica* whereas the leaves of *Ficus roxburghii* absorbed highest amount of energy.
- Assessment of the energy demand and environmental perception on impact of firewood collection from forests indicated that most of the villagers (82.2% of the total respondents) were aware that some reason(s) exists which is responsible for the phenomenon of no recruitment of seedlings in the forest. Only 17.8% respondents were not able to connect any reason/factor for this (share of women was higher than the man, Table-42). The nodal agency for renewable energy, UREDA, in Uttarakhand has initiated Microhydel Projects (3.115

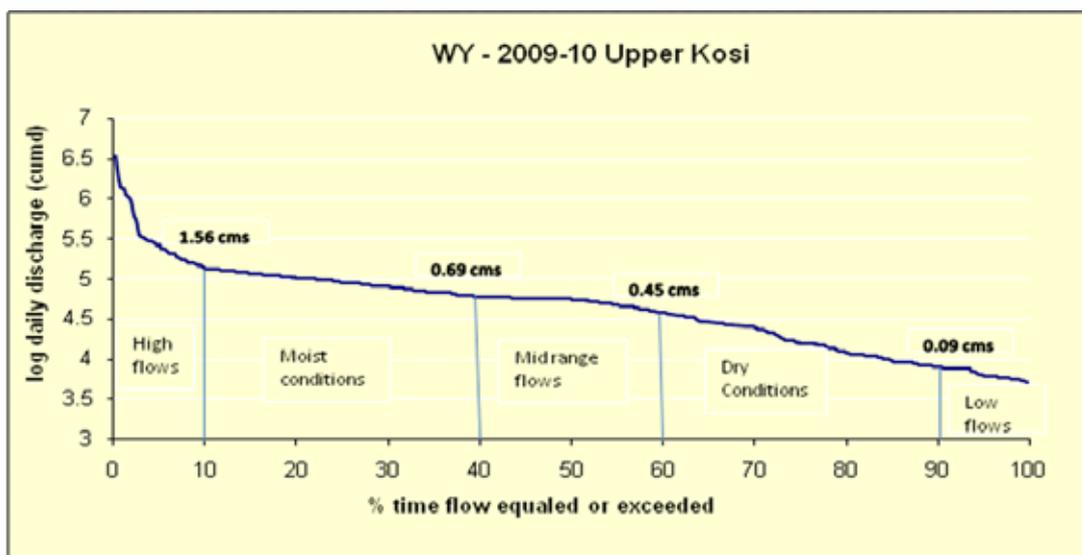


Fig-54. Flow duration curve for Upper Kosi Watershed.

**Table-40.** Distribution of villagers according to their attributes and perceived factors for no recruitment of seedlings in the forest

SI. No	Category/Class	Perceived Factors (% Respondents)				
		Climatic	Fire	Management	Anthro. Activity	No Idea
1	Total Respondents (%)	17.8	32.1	17.8	42.8	17.8
2	Male	100.0	77.7	80.0	16.6	40.0
3	Female	0.0	22.3	20.0	83.3	60.0
4	Education Level					
a	College	40.0	33.4	40.0	-	-
b	Below College	60.0	55.5	40.0	75.0	60.0
c	No formal Education	-	11.1	20.0	25.0	40.0
5	Employment					
a	Service	20.0	12.5	20.0	-	20.0
b	Self Employed	60.0	33.3	40.0	-	20.0
c	No Commercial Activity	20.0	55.5	40.0	100.0	60.0
6	Economic					
	BPL	40.0	22.2	20.0	25.0	40.0

MW) based approach. The proposed project activity involves construction and operation of 29 Microhydel projects in the state of Uttarakhand.

- Under the indigenous knowledge system, phytochemicals of 67 medicinal plants (MPs) used by the traditional *vaidyas* in Upper Alaknanda valley has been documented from published sources. Of the total 102 therapeutic properties and associated active principles, antimicrobial therapeutic property was conferred by maximum number of 14 MPs (*Cuscuta reflexa*, *Psidium guajava*, *Origanum vulgare*, *Ajuga parviflora*, *Solanum nigrum*, *Ficus religiosa*, *Ricinus communis*, *Embllica officinalis*, *Terminalia bellirica*, *Matricaria camomillia*, *Foeniculum vulgare*, *Butea monosperma*, *Mimosa pudica* & *Triticum aestivum*), followed by anti-inflammatory property which was found in 13 MPs, antioxidant property in 12 MPs, anticancer property in 11 MPs, antibacterial property in 10 MPs and antifungal therapeutic property in 7 MPs.

Results suggest that a few medicinal plants of different species within the same genus may have common phytochemicals; for example, Eugenol was found both in *Ocimum sanctum* and *O. americanum* and contain same insecticidal properties. Similarly two species of genus *Ficus* (*F. religiosa* & *F. racemosa*) contain saponins.

- In order to develop analytical models through establishment of modeling & statistical computing laboratory, weather data of North West Himalaya were analyzed for the last century (1901-2001). Results revealed increasing trends in temperature at different rates (Fig.55). A significant increase in winter temperature (both max & min) in J&K and UK, but decrease in HP was noticed; a significantly increasing trend in maximum temperature during monsoon was observed in all the three states. Overall significant decrease in precipitation in J&K and UK; declining but not significant in HP; significantly declining trends of monsoon

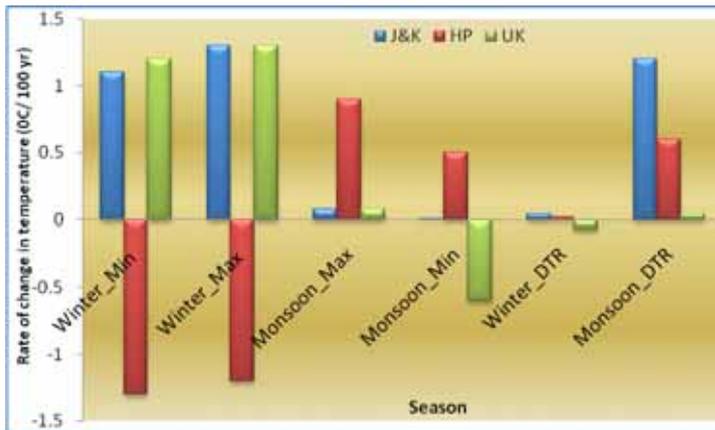


Fig-55. Rate of change in temperature in North-West Himalaya during past century (1901-2001).

precipitation in all three states; increase in winter precipitation in UK & HP; decrease in J&K have been observed.

- In order to quantify the available water resource in microwatersheds of Garhwal region and assessment of water availability during the lean and surplus periods, study was carried out through flow duration curve analysis in some springs. Assessment of water availability indicate that additional storage structures should be constructed to tap the surplus water available during the monsoon period to cope with the seasonal water scarcity in the high mountain basins of Himalaya.

**Group 2: Socio Economic Development (SED) & Environmental Assessment and Management (EAM)**

The group includes two themes: (i) Socio Economic Development (SED) which focuses on activities, such as livelihood enhancement, sustainable tourism, entrepreneurship and self employment, indigenous knowledge, and socio-economic and cultural implications, migration, etc; and (ii) Environmental Assessment

and Management (EAM) targeting on activities such as hill specific Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), valuation of ecosystem services, climate change impacts, disaster mitigation and management, and environmental management of urban areas, etc. The highlights of the R&D work include:

- To address the issue of shifting agriculture in North East Himalaya, physiography and the nature of slope in Ziro valley, Arunachal Pradesh was studied and found that both of these appear to be the determining factors for the overall practice of settled agriculture and non-practice of shifting agriculture by the Apatani tribal community (Fig-56). It was recorded that shifting agriculturists are adopting to terrace cultivation, and cultivated jhum plots are found to be reducing (from 1990-2010) as they are being transformed to terracing,

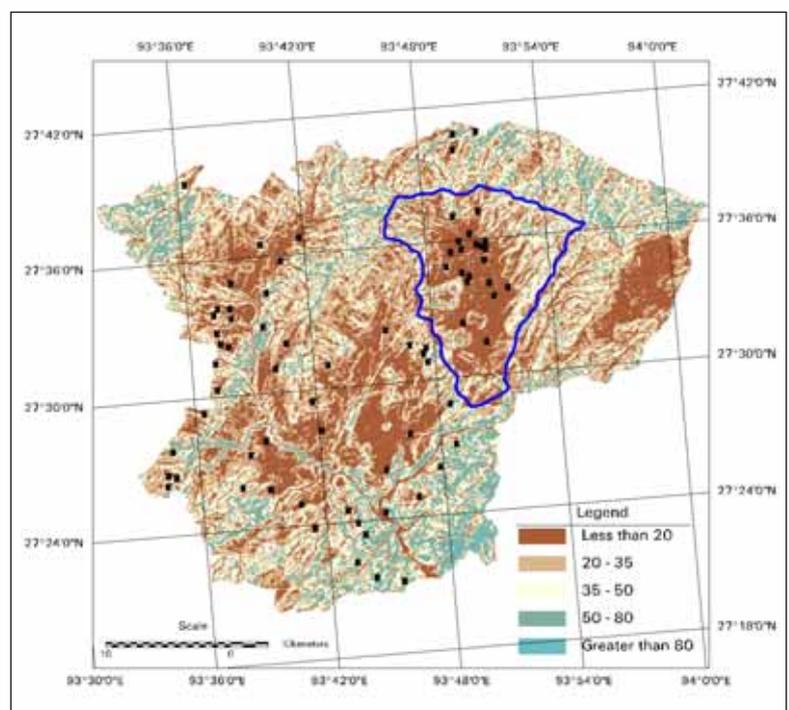


Fig-56. Nature of slope in Ziro valley (encircled by blue boundary) and neighbouring area

- development of horticulture, secondary forests and bamboo forests. In nine villages surveyed during the reporting period, the number of cultivated jhum plots were found to reduce from 365 in 1990 to 170 in 2010.
- To scale up innovative resource management practices for improved livelihoods in central Himalayan region, base line survey for adoption/adaptation of different options for improved livelihoods and management of natural resources has been completed in 56 villages covering 394 households. Preliminary results suggest that the farming system, as a whole, is under stress due to uncertainty of weather conditions, scarcity of water, sectoral approach of the developmental activities, weak backstopping, and unstructured monitoring and evaluation system. Overall improvement on livelihoods of the people during the period has been realized by the stakeholders; however, it has impacted adversely on the status of natural resources and overall farming system of this region. Adoption scenario clearly indicates that the farmer is a selective taker and adopts a very few out of a long list of options provided under different programmes (Table-41).
  - An attempt was made to link biodiversity conservation with sustainable development of Arunachal Pradesh, and community driven conservation practices of floral and faunal diversity have been documented. For example, in Zimithang region, the whole mountain of the Shockeng Gompa is considered sacred prohibiting use of any plant species, including, Rhododendrons, which is used as NTFP elsewhere. *Daphne papyracea* is another plant species, which is traditionally used by Monpas for making hand paper for printing and writing scripts in monasteries. Also, man - animal conflict was identified which included crop raiding and retaliatory killing of carnivores for live stock depredation. About 40 species of mammals belonging to 8 orders, 18 families and 34 genera in the study area have been recorded. About 13 animal species were reported to be in direct conflict with human population. Asiatic Black Bear (*Ursus thibetanus*) was reported to possess its unique ability to raid crop and depredate livestock. Conflict intensity as per the local perception was high for 5 species (38%) while 4 species (31%) showed moderate intensity of conflict with man and, therefore needs proper attention

**Table-41.** On-farm livelihood options: adoption/adaptation during the reporting period

Major Livelihood options	Demonstrations	Adoption/Adaptation	
		Villages	No. of house holds
Off season vegetable cultivation	-	07	11
Improved grasses	-	09	36
Integrated fish farming	-	10	16
Water harvesting & storage	03	03	19
Soil/ water conservation	02	02	05
Farmer's nursery	-	01	02
Composting	-	05	18
Cash crop cultivation	Facilitation	09	18
Horticulture	Facilitation	02	09

- before they become a threat. Another 4 species (31%) showed low intensity of conflict with man. Dhole (*Cuon alpinus*) have the highest conflict intensity (76.7%) of all the cases. Snow leopard (*Unicia unicia*) showed moderate intensity (21%) while Asiatic Black bear had the lowest intensity (0.3%).
- To investigate soil formation, soil fertility, soil and water conservation, hydrological experiments were conducted in two forest types during August – September (total rainfall of 22 events= 396 mm; average rainfall intensity= 2.51 mm/hr). Only 13 rainfall-runoff events (rainfall= 298.2 mm) were considered that could be collected in the runoff collectors, rest (9) were over flow events due to heavy rains and thus were not considered for the analysis. The t- test value was significantly different (95% significant level) for both soil loss ( $t=2.73$ ) and runoff ( $t= 2.80$ ) among Oak and Pine forests. Soil physico-chemical characteristics of Oak and Pine forests across the three depths (cm) were analyzed. Soil water holding capacity, organic carbon and nitrogen was found significantly higher in Oak forests as compared to Pine forests ( $t$  - value significant at 95%) and values for these three parameters declined significantly with increasing soil depth.
  - Under the strategic environmental assessment (SEA) land use statistics of the Satluj catchments a buffer zone of 10 km either of the River Satluj was demarcated. This area lies from northeast to southwest from Nathapa village (Kinnaur district) to Bilaspur town (Bilaspur district). The total length of River Satluj included under present analysis is 165 km. Based on estimation of stream orders, 636 streams were identified in the 1<sup>st</sup> order, 178 in 2<sup>nd</sup> order, 43 in 3<sup>rd</sup> order, 7 in 4<sup>th</sup> order and 1 stream in 5<sup>th</sup> order.
  - Studies on urbanization vis-à-vis solid waste management and air pollution carried out in the six towns of Himachal Pradesh showed a range from 64.7% biodegradable waste [42.2% readily biodegradable waste (RBW) + 22.5% biodegradable waste (BW)] in Keylong to 78.3% (RBW 53.7 %+ BW 24.6%) in Mandi. Based on existing waste composition, bio-composting for biodegradable waste (RBW+BW), reuse, decorative reuse, and recycling for non biodegradable waste (NBW) were major SWM options.
  - In order to assess the gaseous exchange, a study was carried out at Himachal Pradesh. The mean concentration of  $PM_{10}$  was recorded highest with  $40.3 \pm 4.4 \mu g m^{-3}$  at Hamirpur followed by  $35.2 \pm 2.7 \mu g m^{-3}$  and  $24.6 \pm 2.3 \mu g m^{-3}$  at Chamba and Kangra, respectively (Table 4). These values were found within the prescribed limit (i.e.  $100 \mu g m^{-3}$ ) set by the Central Pollution Control Board (CPCB) at all the sites. Due to washout effect during the initial sampling days, lesser amount of  $PM_{10}$  was present in all sites. On diurnal basis, highest concentration of  $PM_{10}$  was found between 16-0 h (IST) followed by 8-16 h and lowest between 0-8 h at all the sites, except at Chamba. The values at Chamba remained highest between 8-16 h followed by 16-0 h and lowest between 0-8 h. The high concentration of  $PM_{10}$  from morning 8 h to midnight was due to day time anthropogenic activities in the towns. On diurnal basis, the concentration of  $SO_2$  remained highest between 16-0 h at Kangra and Chamba, while at Hamirpur it was found highest between 8-16 h. Moreover,  $NO_2$  remained highest between 16 h to midnight at all the sampling sites. In case of  $NH_3$ , different time periods for highest concentration were noted.

### Group 3: Biodiversity Conservation and Management (BCM) & Biotechnological Applications (BTA)

The group includes two thematic areas (i) Biodiversity Conservation and Management (BCM), and (ii) Biotechnological Applications (BTA); the aim is to ensure long term conservation of sensitive Himalayan biodiversity elements and improvement in the rural economy of the Indian Himalayan Region. Highlights of the R&D work carried out under this group are as follows:

- Response assessment survey at Nanda Devi Biosphere Reserves (NDBR), Uttarakhand, Nargu Wildlife Sanctuary (NWLS), Himachal Pradesh, Khangchendzonga Biosphere Reserve (KBR), Sikkim and Tawang-West Kameng Biosphere Reserve (proposed), Arunachal Pradesh revealed the following: (i) In NDBR, the relative contribution of species richness showed no changes in all three layers and remarkable changes in total tree density, seedlings; increase in seedlings from 81.7% (1988-89) to 94.6% (2008-09) was observed. (ii) In NWLS, 10 forest tree communities were identified from 23 sites. Total tree density ranged from 210.0-600.0 Ind ha<sup>-1</sup> and total basal area from 1.9-60.7 m<sup>2</sup>ha<sup>-1</sup>. Shrubs density ranged from 450.0-3390.0 Ind ha<sup>-1</sup>, herbs density from 44.8-156.8 Ind m<sup>2</sup> saplings density from 50-450 Ind ha<sup>-1</sup> and seedlings density from 110-1060 Ind ha<sup>-1</sup>. Species richness ranged from 43-111; it was highest in *Quercus leucotrichophora* community, followed by *Quercus semecarpifolia* and *Cedrus deodara* communities. Species diversity index (H') for trees ranged from 0.26-1.72, saplings from 0.26-1.70, seedlings from 0.17-1.84, shrubs from 1.07-2.8 and herbs from 2.70-3.60. (iii) In KBR, investigation made in eight high altitude sites, to cover analysis of entire transects (total 15 sites), for woody structure and recruitment showed 51 tree and 30 shrub species. The total species significantly declined ( $r = -0.874$ ;  $p < 0.01$ ) along increasing altitudes. (iv) In Tawang-Kameng BR a total of 311 species of flowering plants including endemic, primitive and ethnomedicinal were recorded. Of these 11 species are being overexploited and unsustainable harvesting of these species may threaten their survival in natural habitat.
- In order to promote sustainable utilization of high value plants phytochemical investigation on *Myrica esculenta* fruits has been investigated. Results revealed a significant negative correlation of catechin ( $r = -0.778$ ;  $P < 0.05$ ) with altitude. Correlation matrix revealed that total phenolic and flavonoid contents has significant ( $p < 0.05$ ) positive impact on antioxidant activity (Table-44). Linear regression analysis showed that phenolic contents contribute 46.3 to 47.6% of radical scavenging property ( $r^2 = 0.463$  for DPPH and  $r^2 = 0.476$  for ABTS) and 56.6% of reducing property ( $r^2 = 0.566$ ). Similarly, flavonoids contribute 55.4% to 70.9% radical scavenging property ( $r^2 = 0.554$  for ABTS and  $r^2 = 0.709$  for DPPH) and 47.8% of reducing property ( $r^2 = 0.478$ ).
- The enumeration of microbial communities with particular reference to water quality of river *Jataganga* (District Almora, Uttarakhand), as influenced by the anthropogenic activities and seasonal changes has been completed. Water samples, collected from five different sites, experiencing different anthropogenic pressures, have been analysed for total viable counts and the biological indicators, in four seasons, at two temperatures. Isolation of microorganisms was conducted following standard procedures- Most Probable Number, and Standard Plate Count methods. The

**Table-42.** Correlation matrix between altitude, total phenols, total flavonoids and antioxidant activity measured by different assays in selected populations of *Myrica esculenta* (n= 9)

<i>r</i> value <sup>a</sup>	Altitude	Total phenols	Flavonoids	ABTS	DPPH	FRAP
Altitude	1					
Total phenols	-0.360	1				
Flavonoids	0.004	0.771*	1			
ABTS	0.057	0.691*	0.744*	1		
DPPH	0.176	0.68*	0.843**	0.878**	1	
FRAP	-0.132	0.753*	0.691*	0.949**	0.856**	1
Gallic acid	-0.165	0.057	0.078	0.017	0.264	0.078
Catechin	-0.778*	0.256	0.036	-0.215	0.130	0.036
Chlorogenic acid	-0.379	-0.404	-0.293	-0.371	-0.188	-0.293
ñ-Coumaric acid	-0.101	0.019	0.078	0.017	0.264	0.078

a - Correlation coefficient, Level of significance: \*P<0.05; \*\* P<0.01

phenotypic and genotypic characterization of pure cultures are under progress. The isolates are being classified as coliforms, non coliforms, biological indicators, and soil microorganisms. Selected cultures of bacteria, actinomycetes and fungi have been accessioned by MTCC, IMTECH, Chandigarh; ITCC, IARI, New Delhi and Agarkar Institute, Pune. The gene sequences of the important isolates have been accessioned by NCBI.

- Mass scale propagation for conservation of endangered *Rhododendron maddenii* and *R. dalhousiae* using existing protocol has been developed. Large number of plants have been successfully produced and transferred to the field. More than five hundred tissue culture raised *R. maddenii* are currently being maintained in net house conditions and are ready for field plantation. Also, a micropropagation method was developed for *R. griffithianum* from the cotyledonary nodal segments of 7-week-old seedlings. Multiple shoots were initiated on modified Anderson

(AM) medium containing growth regulators and antioxidants.

#### Application of R & D Outputs in Demonstration and Dissemination:

#### Capacity building through Rural Technology Center (RTC)

- The participatory action Research and Training Centers (RTCs) at Triyuginarayan and Kosi got wide popularity and played a catalytic role in capacity building of the user groups on various rural technologies either introduced or developed by the Institute. A total of 22 training and awareness programmes were conducted for different user groups at different RTCs (farmers/officials selected by the Govt. and non - govt. organizations, farmers selected by the Institute programmers and students, etc. of which 21% training/awareness programmes were State Biotechnology Department, 21% NGOs, 20% Watershed Management, 11% belonged to student groups, 11% Institute programmes, and 11% were sponsored by the Horticulture

**Table-43.** Training organized for different user groups (April, 2010 – March, 2011)

Users	Total	Male	Female
Farmers selected by Govt. organizations	381	300+50	81+75
Farmers selected by NGOs	605	273	332
Institute programme	31	19+20	12+25
Students	243	177	66
Total	1260	839	591
Districts covered		8	
Villages covered		42 + 6 = 48	

and other Government Departments and 5% Livelihood Improvement programme. A total of 1260 persons (Female, 591 and Male, 839) covering 5 districts and 42 villages in Uttarakhand were benefited (Table-43).

- Towards certification of the raw material of medicinal plants grown by the farmers and local producers of the area Quality Assurance Laboratory has been established. In the initial phase prioritized medicinal plants of Uttarakhand were taken up for developing chemical profiles.
- In order to strength the fodder resources, and for developing a pilot model for reducing drudgery of rural women in Kedarnath Valley, a total of 4.0 ha of

waste land has been developed in a fodder bank at Maikhanda village. The results of assessment of total green fodder collection showed highest for Shersi village  $84 \pm 6.23$  kg/household/day, whereas it was lowest for the lower altitude village of Maikhanda ( $64.4 \pm 3.60$  kg/household/day; Table-44).

- Under the demonstration programme, value addition and up-gradation of traditional wild edible products for sustainable livelihoods, appropriate approaches & framework for capacity building & skill development in the area of bioprospecting and value addition of non-timber forest products (NTFPs) were

**Table-44.** Quantity of green fodder collected from March-October in selected villages located at different altitudes of Kedarnath Valley, Uttarakhand

Village	Number of Backload/HH/Day	Quantity Kg/HH/day	Quantity Kg/HH/month	Quantity Kg/HH/season
Tosi	2.38±0.10	83.52±3.63	2,505.68±108.86	20,045.46±870.88
Triyuginarayan	2.4±0.18	84±6.22	2,520±186.84	20,160±1,494.79
Shersi	2.3±0.15	84±6.23	2,522±187.85	20,167±1,496.82
Rampur	2.36±0.12	82.6±4.23	2,478±126.87	19,824±1,014.97
Sitapur	2.36±0.16	81.9±5.32	2,457±159.59	19,656±1,276.68
Maikhanda	1.84±0.10	64.4±3.60	1,932±108.10	15,456±864.83

\*HH(Household)

initiated. Strong linkages with networking was developed with various institutions, NGOs and line departments for wider popularization of the use of wild edibles. The package of practices was disseminated for value addition of some potential species such as *Viburnum mullaha*, *Paeonea emodii* and *Rhododendron arborem* to some of the local NGOs and few of them, e. g., Swaraj Swayat Sanstha (Masta, Guptakashi), Laxmi Fal Sanrakchan Avam Kutir Udhyog (Agustyamuni), Mohil Fal Sanrakchan (Silly, Agustyamuni) have started preparing and marketing various products made out of these species.

- A small bioprospecting unit has been established for demonstration and processing of locally available bioresources. So far more than 165 families in the 13 villages of upper Kedar valley in district Rudrapryag have made strategic interventions in respect of bioresource based products, and enterprise development for enhancing local livelihood opportunities and creating economic incentives for conservation.
- Three training programmes has been organized through which 90 participants were provided training and live demonstration about value addition of wild edibles and agri-crops. as a source

### R&D progress of GBPIHED

Prioritized R&D activities			
R&D Themes	RESEARCH	DEMONSTRATION	DISSEMINATION
Environmental Status Assessment and Monitoring	<ul style="list-style-type: none"> <li>• Land and water resources assessment, monitoring of climate sensitive areas</li> <li>• Dynamics studies of sensitive biodiversity elements (species/habitats)</li> <li>• Impact of development initiatives on natural systems</li> <li>• Resource-use surveys for rural planning</li> <li>• Documentation of IKS and database development</li> </ul>	<ul style="list-style-type: none"> <li>• Eco-Restoration and conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building/ skill development</li> </ul>
Environmental Conservation and Management	<ul style="list-style-type: none"> <li>• Strengthening conservation of priority areas/species</li> <li>• Eco-restoration of degraded sites/areas</li> <li>• Factors and processes for mountain hazard management</li> <li>• Microbial diversity, potential application &amp; culture collections</li> </ul>	<ul style="list-style-type: none"> <li>• Arboretum, herbal gardens, multipleuse garden and <i>Vriksh Vatika</i></li> </ul>	<ul style="list-style-type: none"> <li>• Networking</li> </ul>
Developmental options/ strategies/ plans	<ul style="list-style-type: none"> <li>• Resource management interventions</li> <li>• Propagation of economically important plants</li> <li>• IERP for IHR</li> </ul>	<ul style="list-style-type: none"> <li>• Livelihood options</li> </ul>	<ul style="list-style-type: none"> <li>• Publications /documentation</li> </ul>

**Table-45.** The core competence / services available with the Institute

Competence	Services
<ul style="list-style-type: none"> <li>• Village Environment Action Plan (VEAP)</li> <li>• Natural Resource Assessment &amp; Management</li> <li>• Water Resource Conservation</li> <li>• Biodiversity Characterization and Monitoring</li> <li>• Documentation of IKS</li> <li>• Environmental Physiology and Plant Adaptation</li> <li>• Biotechnological and Microbiological Applications</li> <li>• Environmental Impact Assessment &amp; Environmental Management Plans</li> <li>• Wasteland Development/ Restoration</li> <li>• Resource Mapping for Rural Planning and Management</li> </ul>	<p><i>Laboratory Analysis</i></p> <ul style="list-style-type: none"> <li>• Plant, soil, water and air quality</li> <li>• Meteorological data analysis</li> <li>• Biochemical investigations on medicinal/ edible plants</li> <li>• Microbiological and biotechnological experimentation</li> </ul> <p><i>Capacity Building</i></p> <ul style="list-style-type: none"> <li>• Natural Resource Management</li> <li>• Nature protection and conservation education</li> <li>• RS/GIS training</li> <li>• Training on low-cost rural technologies</li> <li>• Disaster management</li> <li>• Doctoral/Masters and Graduate level dissertations</li> </ul> <p><i>Consultancies</i></p> <ul style="list-style-type: none"> <li>• Water Resource Management –Catchment Area Protection</li> <li>• Hydropower - EIA/EMP</li> <li>• Project formulation on bioresources</li> <li>• Watershed Management Strategies</li> <li>• Environmental guidelines and monitoring plans for watershed management</li> <li>• Landscape planning for mountain risk engineering</li> <li>• Biodiversity assessment and Monitoring</li> <li>• Impact of agricultural diversification</li> </ul> <p><i>Other Services</i></p> <ul style="list-style-type: none"> <li>• Gene bank and identification of plants</li> <li>• Supply of elite planting material of selected herbs &amp; multi-purpose trees (MPTs)</li> <li>• Library &amp; Information, and dissemination through books, journals, periodicals, etc.</li> </ul>
<p><i>Institutional Networking</i></p>	

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of income for user groups/unemployed youth of the region by making a variety of value added edible products such as Jam, squash, juice, sauce, pickle, etc.

– On - site trainings and formal meetings were organized, covering over 30 villages, 4 Van Panchayats, 6 NGO groups, and 400 farmers in Uttarakhand,

Himachal Pradesh, Arunachal Pradesh and Sikkim. Also, two training programmes and live demonstrations were conducted in Garhwal region for value addition of wild edibles and agri-crops through production of a variety of local value added products, i.e. juice, squash, pickle, jam, sauce, etc. Similarly, a training program on formulation of district disaster management plan was conducted for senior to middle level officers of line departments of Govt. of Sikkim jointly with National Institute of Disaster Management, New Delhi & Land Revenue, and Disaster Management Department, Govt. of Sikkim.

- Based on the participatory discussion, training manuals on various technology packages were prepared, and distributed to the farmers and user groups.

Throughout the year, the R&D findings of the Institute were disseminated through publication of research papers in scientific journals and magazines, popular articles and books and through Institute publications: Pt. G.B. Pant Memorial Lectures by eminent thinkers and scholars, Hima-Paryavaran (Biannual-Newsletter), ENVIS Bulletin, ENVIS Newsletter, Himalayan Biosphere Reserve Bulletin (Biannual) by Lead centre, and Annual Report.

### Services

Based on its competence gained over the years on different aspects of mountain-specific environment and development issues the Institute is fully equipped to extend services in diverse sectors; some of the areas are given in Table-47.

### Forestry Research

#### Indian Council of Forestry Research and Education (ICFRE), Dehradun

Indian Council of Forestry Research and Education (ICFRE), an apex body in the national forestry research system, has been undertaking the holistic development of forestry



Fig-57. Achanakmar Biosphere Reserve

research through need based planning, promoting, conducting and coordinating research, education and extension covering all aspects of forestry. The Council deals with the solution based forestry research in tune with the emerging issues in the sector, including global concerns such as climate change, conservation of biological diversity, combating desertification and sustainable management and development of resources. Topical research by the Council enhances public confidence in the ability of forest managers and researchers to successfully handle challenges related to natural resource management.

### Objectives

- To undertake, aid, promote and coordinate forestry education, research and applications thereof.
- To develop and maintain a National Library and Information Centre for forestry and allied sciences.
- To act as a clearing-house for research and general information related to forests and wildlife.
- To develop forestry extension programmes and propagate the same through mass media, audio-visual aids and extension machinery.
- To provide consultancy services in the field of forestry research, education and allied sciences.
- To undertake other jobs considered necessary to attain these objectives.

## Institutes and Centres under the Council

ICFRE has eight Regional Research Institutes and four Research Centres located in different bio-geographical regions of the country to cater to the forestry research needs of the nation.

### Research Institutes under the Council are

- Forest Research Institute (FRI), Dehradun
- Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore
- Institute of Wood Science and Technology (IWST), Bengaluru
- Tropical Forest Research Institute (TFRI), Jabalpur
- Rain Forest Research Institute (RFRI), Jorhat
- Arid Forest Research Institute (AFRI), Jodhpur
- Himalayan Forest Research Institute (HFRI), Shimla
- Institute of Forest Productivity (IFP), Ranchi

### Advanced Research Centres under the Council are

- Centre for Social Forestry and Eco-Rehabilitation (CSFER), Allahabad
- Centre for Forestry Research and Human Resource Development (CFRHRD), Chhindwara
- Forest Research Centre (FRC), Hyderabad
- Advanced Research Centre for Bamboo and Rattans (ARCBR), Aizawl

### Forest Research Institute (FRI), Dehradun

Forest Research Institute (FRI), Dehradun is working on diversity in *Ganoderma lucidum* in North India and collected more than 75 specimens from Haryana, New Delhi, Punjab, Uttarakhand and Uttar Pradesh for conservation and utilization.

### Indian Institute of Forest Management (IIFM), Bhopal

The Institute, as a sectoral management institute, imparts education in forest

management, which is a judicious mixture of forestry, social, and management science. The Institute constantly endeavours to keep in touch with the problems of people, especially the forest dwellers and undertakes need-based research. The Institute tries to serve as a reservoir of knowledge in the area of forest management and ensures proper integration of external and indigenous knowledge suitable to Indian context.

### Research and Consultancy

- To generate information on field realities and derive meaningful interpretation through systematic research.
- To offer consultancy services to the client organizations based on the available expertise.

### Research

- Research being one of the key activities of the Institute, it actively undertook various research projects in diverse areas. IIFM completed seven research projects during the year, of which two were sponsored by IIFM and five were externally sponsored projects. Currently, there are 26 ongoing research projects at IIFM.

### Centres of Excellence

#### International Centre for Community Forestry (ICCF)

The International Centre for Community Forestry (ICCF) is functioning as a "Centre of Excellence" to cater to the growing need and interest in Community Forestry initiatives. It aims to promote community forestry initiatives and publications in the field of Joint Forest Management (JFM), Self-Initiated Forest Protection (SIFP) and other forms of community based forest management system.

The Centre began functioning actively in 2001, with fund support from the Sir Dorabji Tata Trust (SDTT), Mumbai. Later, it received many projects from various governments and

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non government agencies through which the Centre catered its other ongoing community forestry projects. The Centre envisages programs implementation involving exchange of scientists, researchers and community forestry workers from India and other countries.

The Centre has been entrusted with a study under UNDP-GEF-MOEF project, to suggest revised guidelines for JFM with a focus on conservation and sustainable use of medicinal plants. A series of consultative workshops are scheduled to be conducted for this purpose. One such workshop was conducted in Delhi on 04<sup>th</sup> March, 2011. The centre has prepared a training manual for capacity building of BMC members in the state of Madhya Pradesh. One training workshop for Bhopal, Raisen, Vidisha and Rajgarh districts was conducted on 06<sup>th</sup> August, 2010 at IIFM, Bhopal.

### **Center for Ecological Services Management (CESM)**

The Centre for Ecological Services Management (CESM) has been set up as an interdisciplinary centre to address crucial policy issues associated with the complex relationship between ecological, social, economic, legal and institutional aspects of ecosystem management. Several initiatives have been taken by organisations on the issues of environment and development in south and south East Asia, but the number of professional organisation working on the related issues on valuation and developing markets and incentive based mechanism ecosystem services is very small. CESM specifically addressed this crucial gap and would undertake research, consultancy, teaching, training activities as well as prepare data base on the values of ecosystem services, develop and standardise techniques of valuation of ecosystem service and impact studies of degradation. It also networks with national and international organisations in the NRM Sector for promoting professional exchange.

### **Center for Sustainable Forest Management & Forest Certification (SFM & FC)**

Forest Certification has emerged as an important market driven tool and a mechanism for assessment and monitoring of forest and forest products. It is a process that leads to the issuing of a certificate by an independent party, which verifies that an area of forest is managed to a defined standard.

The center for SFM & FC represents IIFM as member in both the National Working Group as well as the National Forest Certification Committee, constituted by Govt. of India.

The center is expected to generate the pool of knowledge and understanding on the emerging field of Stainable Forest Management & Forest Certification for the benefit of forestry sector in the country.

During the year 2010-11, one training-cum-workshop course for the officers of Indian Forest Service was conducted. An IIFM supported pilot study for developing standards for certification of NTFPs was also undertaken during the year. Details of the activities are provided in the concerned sections of the report.

### **Center for Livelihood Management**

Centre for Livelihood Management's mission is "Sustainable Livelihood Enhancement of Communities including Poor, Marginalised and Women". The centre acts as a Resource Centre for Stakeholders in the area of training, research, documentation, consultancy, network and advocacy activities. It provides a forum for influencing the programmes and policies related to livelihood. It also strives for dissemination of technology and approaches which can sustain livelihood. The stakeholders would include government officials implementing various development projects for livelihood enhancement, personnel from NGO and Civil Society organisations,

representatives of Panchyati Raj Institutions and Communities.

During the year 2010-11 the Centre has undertaken two training programmes, one research project and three workshops.

### **Regional Center for National Afforestation and Eco-development Board (RCNAEB)**

The Regional Centre for National Afforestation and Eco-development Board, (RCNAEB), came into existence in year 1989 at the Institute. Since then the Centre has been working in the areas related to afforestation and eco-development in the States of Madhya Pradesh, Chhattisgarh and Odisha as per the mandate contained in the Memorandum of Understanding (MoU) signed between the National Afforestation and Eco-development Board (NAEB), MoEF, GoI and IIFM.

The main focus area of this Regional Centre is National Afforestation Programme (NAP) of MoEF, GOI which aims at supporting and accelerating the ongoing process of devolving forest protection, management and development functions to institutions of Joint Forest Management i.e. Joint Forest Management Committees (JFMCs) at the village level, and Forest Development Agencies (FDAs) at the forest division level. RCNAEB, Bhopal is supporting the JFMCs, which are the main organs of Joint Forest Management in capacity building at the grassroots level. This decentralised two-tier institutional structure (FDAs and JFMCs) allows greater participation of the community, both in planning and implementation, to improve forests and livelihoods of the people living in and around forest areas in addition to significantly empowering the local people in participating in the decision making process.

During the financial year 2010-11, the Centre has undertaken 12 training programmes, five workshops and three awareness raising programmes. Eight research

projects were completed during the year whereas 14 projects are ongoing.

### **Training**

The Institute has been organizing short-term training courses, seminars and workshops to transfer technical and managerial skills being generated by faculty areas of the institute. The focus of these programmes is on evolving, analyzing and synthesizing various management techniques/ tools, ideas and concepts relevant to the forestry and allied sector. During the year the institute conducted 33 Management Development Programmes, organised 23 workshops/seminars which include programmes conducted under externally funded projects like ICCF, ITTO and RCNAEB.

### **Consultancy**

The Institute completed two consultancy assignments and eight more are in progress.

Some of the client organizations for consultancy assignments include Haryana Forest Department; Tribal Welfare Department, Govt. of M.P.; M.P. State Employment Guarantee Council, Department of Panchayat and Rural Development, Govt. of M.P.; M.P. Forest Department; Department of SC/ST Welfare, Govt. of M.P.; Birla Corporation Limited, Satna; Environmental Planning and Coordination Organisation (EPCO), Bhopal; Andaman & Nicobar Forest Department, Haddo, Port Blair; Himachal Pradesh Forest Department, Shimla; Khadi and Village Industries Commission, Mumbai, etc.

### **Publications**

The Institute continues to disseminate its research findings to the larger audience through its own publications and also by publication of research papers in reputed journals, books and also by presentation of papers in national and international conferences. The faculty also participated and presented research papers in national and international conferences.

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### Other Activities

The year 2010-2011 was marked by significant progress in different areas of academic activities. The Students Council of IIFM has also been very active during this year and organized number of academic as well as extra-curricular events.

### Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru

Established in 1962 as a co-operative research laboratory at the initiative of the Indian Plywood Industry with participation of the Council of Scientific and Industrial Research, Indian Plywood Industries Research and Training Institute (IPIRTI) is now an autonomous Research and Training Institute under the Ministry of Environment & Forests, Government of India. From the inception, the Institute has been closely associated with development of plywood and panel industry in the country and also instrumental in the growth, from its infant stage. The Institute is an industry driven organization. Recognized (since 1989) as a Scientific & Industrial Research Organization by the Government of India under the Department of Scientific and Industrial Research Scheme.

The Institute is basically mandated to carry out research and development, training and education, testing and standardization and extension in the field of plywood and panel product manufacturing. The multidisciplinary research projects based on the problems identified by the industrial representatives, Institute Scientists and other similar interested organizations, are taken up. This is the only Institute of its kind in the country working for the plywood and panel industries. Due to expertise and credibility established over many years, the Institute has developed a strong relationship with the industry and well recognized for its contribution. As a result, industry continues to support our research efforts. An important and unique aspect of R

& D works at the Institute is that lab scale findings are upscaled to industrial level to facilitate their adoption by the Industries.

### Wildlife Research

### Wildlife Institute of India (WII), Dehradun

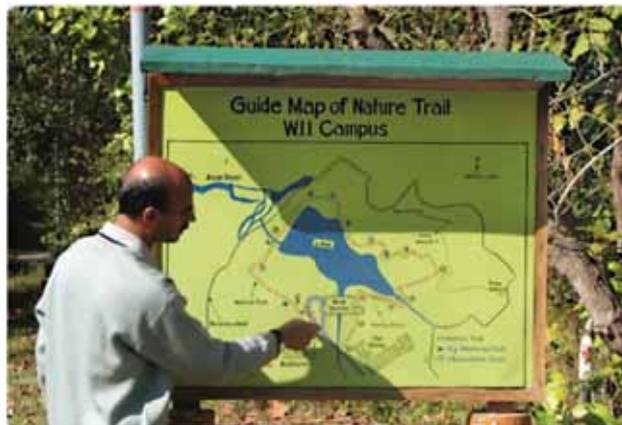


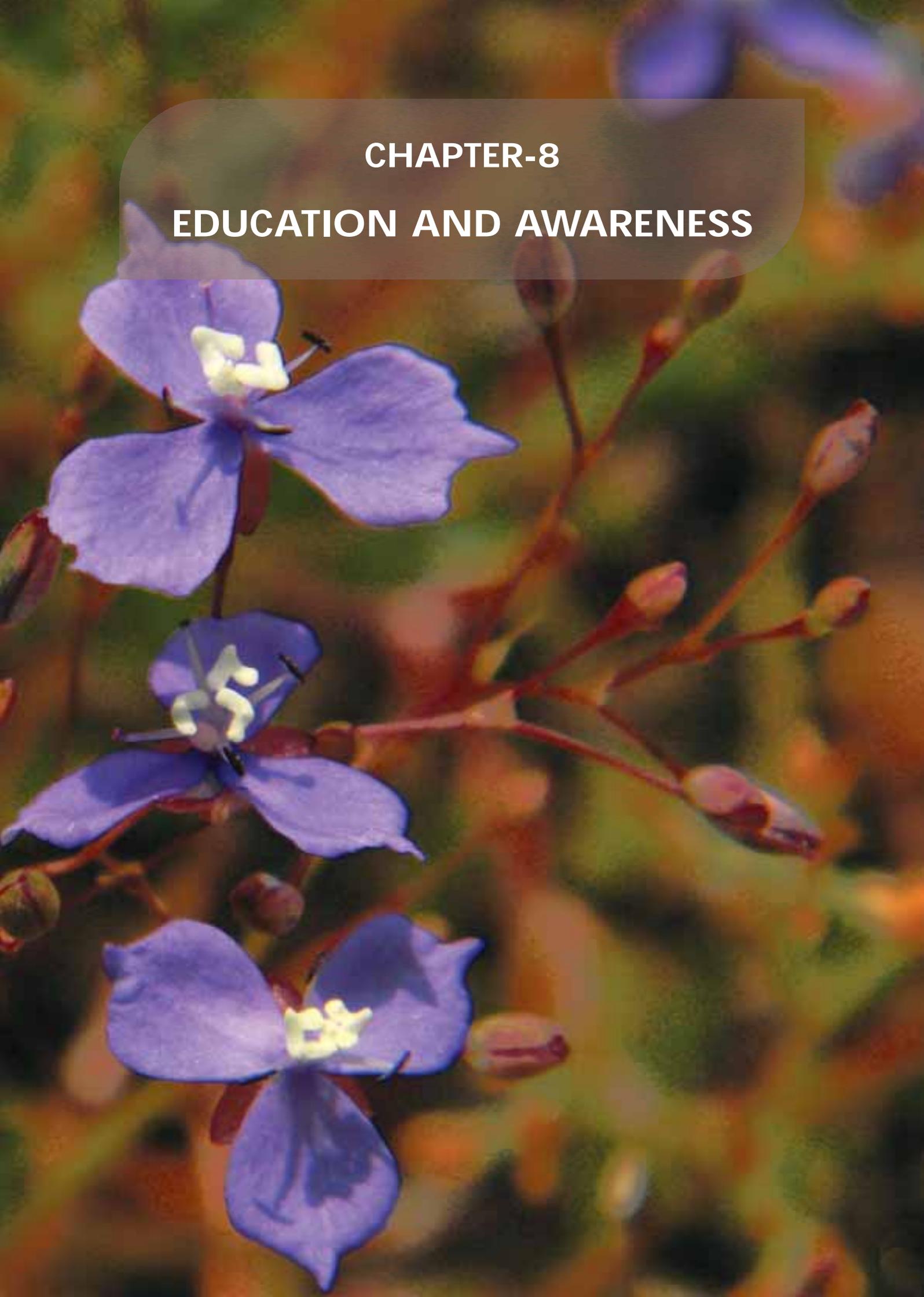
Fig-58. Route map of WII Campus, Dehradun

Wildlife research at the Institute covers ecological, biological, socio-economic and managerial aspects of wildlife conservation. The research projects generate valuable scientific data, help evolve study techniques relevant to the Indian ground condition, and also create a group of trained field biologists, socio-economists and wildlife managers. The scientific information generated is utilized for management of protected areas. Research also enables the Institute's faculty to keep abreast of the current field situations, management needs and research trends in the field and thus constantly enhance its professional skills and update its teaching inputs. The research agenda is decided and guided by the Training, Research Advisory Committee (TRAC) comprising eminent conservationists, academicians and representatives of scientific organizations as well as state wildlife organizations, which ensures that research conforms to the national conservation priorities.

During the reporting period, 16 research projects were completed and 40 research projects were ongoing in the Institute.

## CHAPTER-8

# EDUCATION AND AWARENESS



## Environmental Education, Awareness and Training

### Introduction and Objectives

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 urbanisation 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. This scheme was launched in 1983-84 with the following basic objectives:

- To promote environmental awareness among all sections of the society;
- To spread environment education, especially in the non-formal system among different sections of the society;
- To facilitate development of education/training materials and aids in the formal education sector;
- To promote environment education through existing educational/scientific/research institutions;
- To ensure training and manpower development for environment education, awareness and training;
- To encourage non-governmental organizations, mass media and other concerned organizations for promoting awareness about environmental issues among the people at all levels;
- To use different media including films, audio, visual and print, theatre, drama, advertisements, hoarding, posters, seminars, workshops, competitions, meetings etc. for spreading messages concerning environment and awareness; and
- To mobilize people's participation for preservation and conservation of environment.

### Activities undertaken during the year

The major programmes undertaken to achieve the overall objectives of the scheme are as follows:

#### National Green Corps (NGC) Programme

It is a well established and recognised fact that the children can be catalysts in promoting a mass movement about the ensemble of the environmental issues. Being future citizens, inculcation of environment friendly attitudes and behavioural patterns amongst them can make a significant difference to the long term efforts for protection of environment. Children are triggers for a

chain reaction, making a difference at the local and community level which in due course lead to awareness at village, city, State, country and global level. MoEF has hence, embarked upon a major initiative for creating environmental awareness among children by formulating National Green Corps (NGC) in 2001-02. 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.

During financial year 2011-12 (as on 07.03.2012), 99,063 Eco-clubs were supported by the Ministry across the country.

### **National Environment Awareness Campaign (NEAC)**

The need for a mass movement for protection of environment needs no emphasis. The concerns of the people for environment need to be harnessed into voluntary action. This requires a network of nodal agencies and grass-root level organisations.

The NEAC was hence launched in mid 1986 with the objective of creating environmental awareness at the national level. In this campaign, nominal financial assistance is provided to NGOs, schools, colleges, universities, research institutes, women and youth organisations, army units, government departments etc. from all over the country for conducting awareness raising and action oriented activities. The awareness activities could be seminars, workshops, training programmes, camps, padyatras, rallies, public meetings, exhibitions, essay/debate/painting/poster competitions, folk dances and songs, street theatre, puppet shows, preparation and distribution of environmental education resource materials etc. Action components could be plantation of trees, management of household waste, cleaning of water bodies, taking up water

harvesting structures, use of energy saving devices etc. 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.

This programme was continued during this year with the main theme as 'Forests for Sustainable Livelihood'. The following sub-themes were considered for financial assistance:

- (i) Afforestation,
- (ii) Forest Conservaton,
- (iii) Forest and Climate Amelioration,
- (iv) Forest for Water,
- (v) Participatory Forest Management,
- (vi) Agro/Social Forestry,
- (vii) Forestry in Urban and Peri Urban Area,
- (viii) Renewable Energy,
- (ix) Green India Mission.

Thirty four Regional Resource Agencies (RRAs) appointed by the Ministry are involved in conducting, supervising and monitoring the NEAC activities during the year. A total of 14,297 organisations have been involved in the campaign across the country. The Ministry sanctioned an amount of Rs.12.12 Cr to the RRAs for further disbursement among the approved participating organisations.

### **Library**

The Library is the documented repository of the Ministry for dissemination of information in the field of environment and its associated areas. It has a collection of over 25,000 books and Technical reports etc. Besides, the library also receives more than 38 national/international journals covering diverse areas of environment. Being the scientific Ministry, Library is one of the richest documentary

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bases for scientific journals in the field of environment and its associated areas.

The library performs an important role in the planning, promotion, implementation and coordination of the Ministry's objectives by providing timely access to relevant and comprehensive information to its users-officials of the Ministry, external organizations (both governmental and non-governmental), research students, decision makers etc.

Research scholars from various organisations, institutions and other professional bodies visited the library for a variety of information required by them from time to time.

### Seminars/Symposia/Workshops

This programme provides a platform to scientists/environmentalists/ University professionals/ technocrats, etc, to share their knowledge on various subjects related to environment. The Ministry provides financial assistance to the Universities/other institutions/ NGOs to organise events (seminars / Symposia/Workshops/Conferences) and to publish the proceedings. The scheme facilitates the transfer of technical know-how to different people including local population.

Universities/professional bodies/ technical institutions and other R&D organisations are very responsive to the programme as is evidenced by the increase in the number of proposals being received by the Ministry. Thrust areas as identified under the programme are under constant review and being expanded to include more new areas. Proposal to enhance the monetary ceilings for events at District, State, National and International levels is under consideration to expand the outreach of the programme both geographically and demographically. During the financial year 2011-12 (as on 07.03.2012), 17 organisations were provided financial assistance for conducting seminars/symposia /workshop etc.

### Mass Media

Media Cell of the Ministry is mandated with taking up awareness campaigns using print and electronic media besides other mass media to enhance awareness about various environmental issues which would in turn facilitate better compliance with environment regulations. Media Cell is guided by an Advisory Committee of Experts on Media Matters under the Chairmanship of Secretary (E&F) in this regard. During the year, as per the Media Action Plan (MAP) adopted by the Ministry, the following major activities were supported/sponsored/completed:

- The World Environment Day (WED) was commemorated on 5<sup>th</sup> June 2011 on the theme: 'Forests : Nature at Your Service'.
- Green Haat was organised on 1-5 June, 2011 at Delhi for expo-cum-sale of minor products from forests – food, medicinal/health products, cosmetics and handicrafts.
- CMS, a Delhi based multi-disciplinary think tank hold an international Biodiversity Film Festival on 1-4 June, 2011 at New Delhi.
- The National Museum of Natural History with its partner institutions organised a special Nature Camps for different children at Bangalore on 2-5 June, 2011.
- Celebrities, sportspersons, youth and general public took part in special walkathons and marathons organised at Delhi and Bangalore.
- The Wildlife Institute of India (WII), Dehradun organised a Workshop on 5th June, 2011 on Emerging Issues in Wildlife Conservation with NGOs concerned, citizens and academic institutions.
- Supported the CMS Vatavaran - Environment & Wildlife Film Festival and Forum 2011 on 6-10 December, 2011 at New Delhi.

- Released advertisement in National and Regional Newspapers in English, Hindi and regional languages for National Environmental Awareness Campaign 2011-12.

### Grants-in-Aid to Professional Societies & Institutes

The objective of the programme is to facilitate optimum utilization of expertise available with professional societies and institutions for promotion of environment education and awareness. The programme aims at utilizing the existing capacities while simultaneously providing for enhancing the capacities of such institutions. The projects to be financially supported would interalia include development/extension of exhibition galleries, interpretation centres and education materials relating to ecology, wildlife and environment. The financial assistance is not provided for procurement of capital goods/ equipment. However, some office equipment like computer, projector etc can be purchased if they are incidental to or essential part of exhibition galleries, interpretation centres and educational focused activities. This one time grant is also not available for research, collection and compilation of data and information or to any individual / business houses.

### Publication of resource material related to environment

The objective of this programme is to utilize expertise available with professional societies, voluntary organizations, institutions etc. for developing and publication of innovative and high quality resource material for promoting environmental education and awareness by providing financial assistance for development and publication of such material. The publication material must popularize the understanding about the environment, emerging issues and out of the box solutions including innovative approaches for protection and should be relevant and of high standard and should supplement the

efforts of the Ministry to promote environment education and awareness.

Under the programme, grant is not provided for publication of newsletters, magazines, journals, periodicals etc. or to any publisher/business house including individuals.

### Global Learning and Observations to Benefit the Environment (GLOBE)

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.

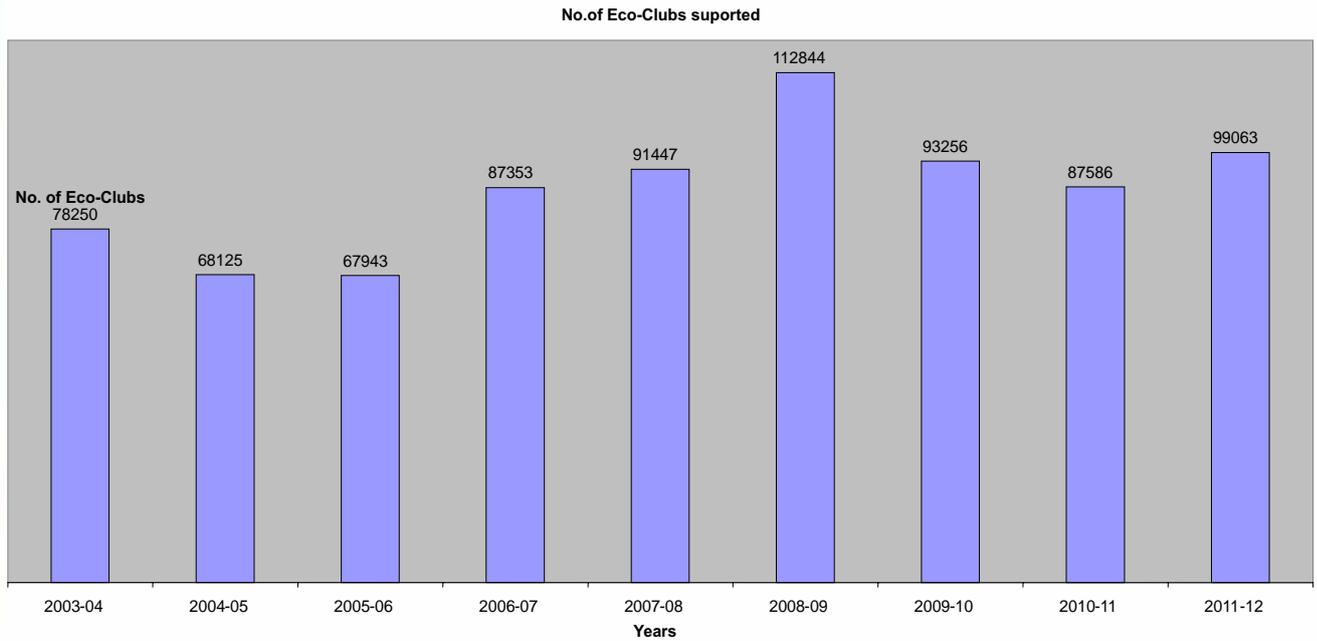
It facilitates research through a worldwide research team comprising of students, teachers and scientists.

### Other Awareness Programmes

Since the financial assistance provided for awareness programmes under the NEAC is for activities to be conducted in a specific time frame and are short-term projects restricted to a specific area, other proposals for creating awareness among diverse target groups are received throughout the year from various NGOs and other agencies. These are considered on merit as and when received and supported. Some of the major awareness activities conducted/sponsored during the year are mentioned below:

- 7<sup>th</sup> Vocational Programme on Natural Resources (VPCR) was organised by Aravali Foundation for Education, New Delhi.
- The Green Olympiad and TERRA Quiz

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*(support extended during 2011-12 is as on 07.03.2012)*

Fig-59. Numbers of Eco-clubs supported since 2003-2004

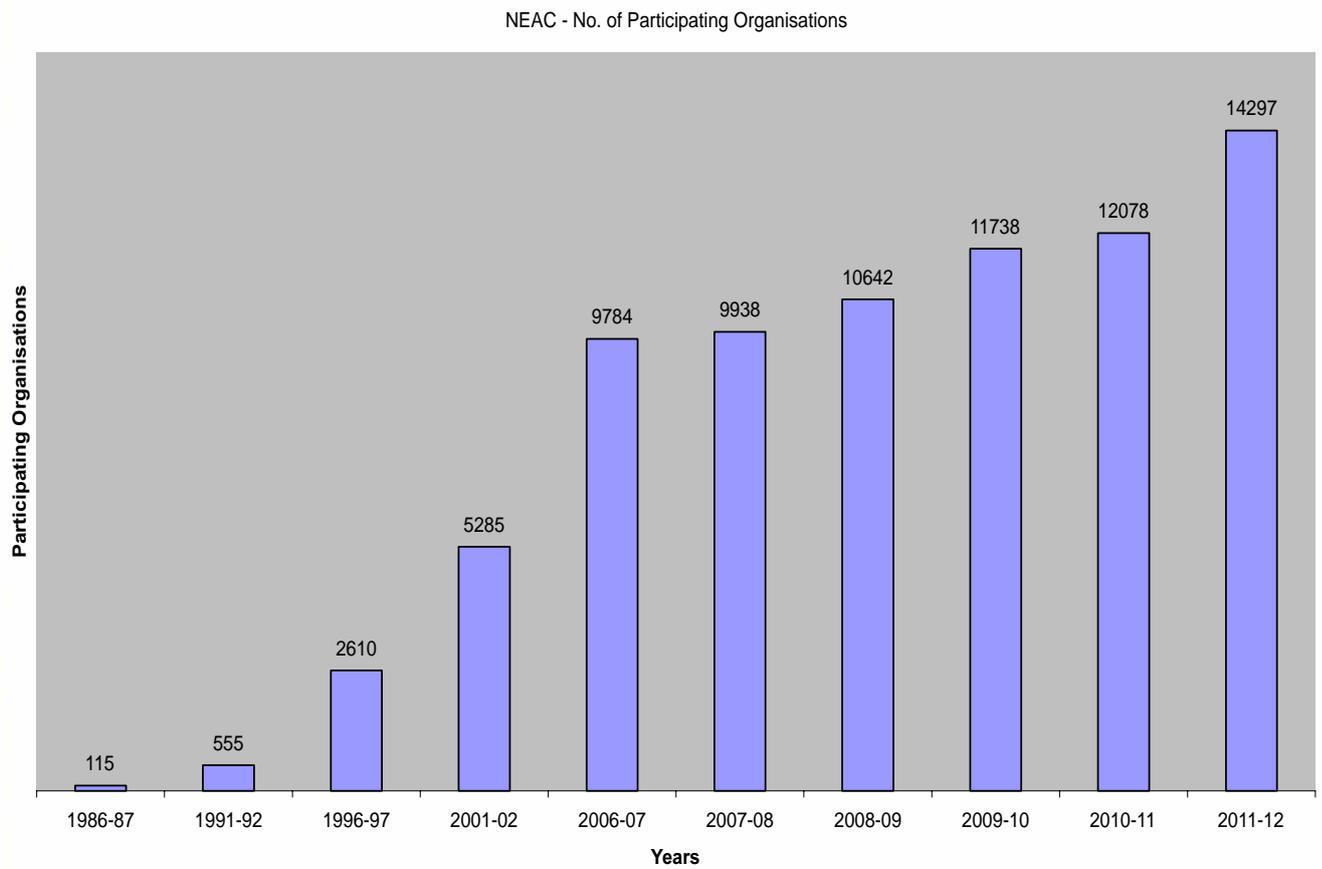


Fig-60. Numbers of participating organisations in NEAC since 1986-87

Plan Expenditure - EE Division

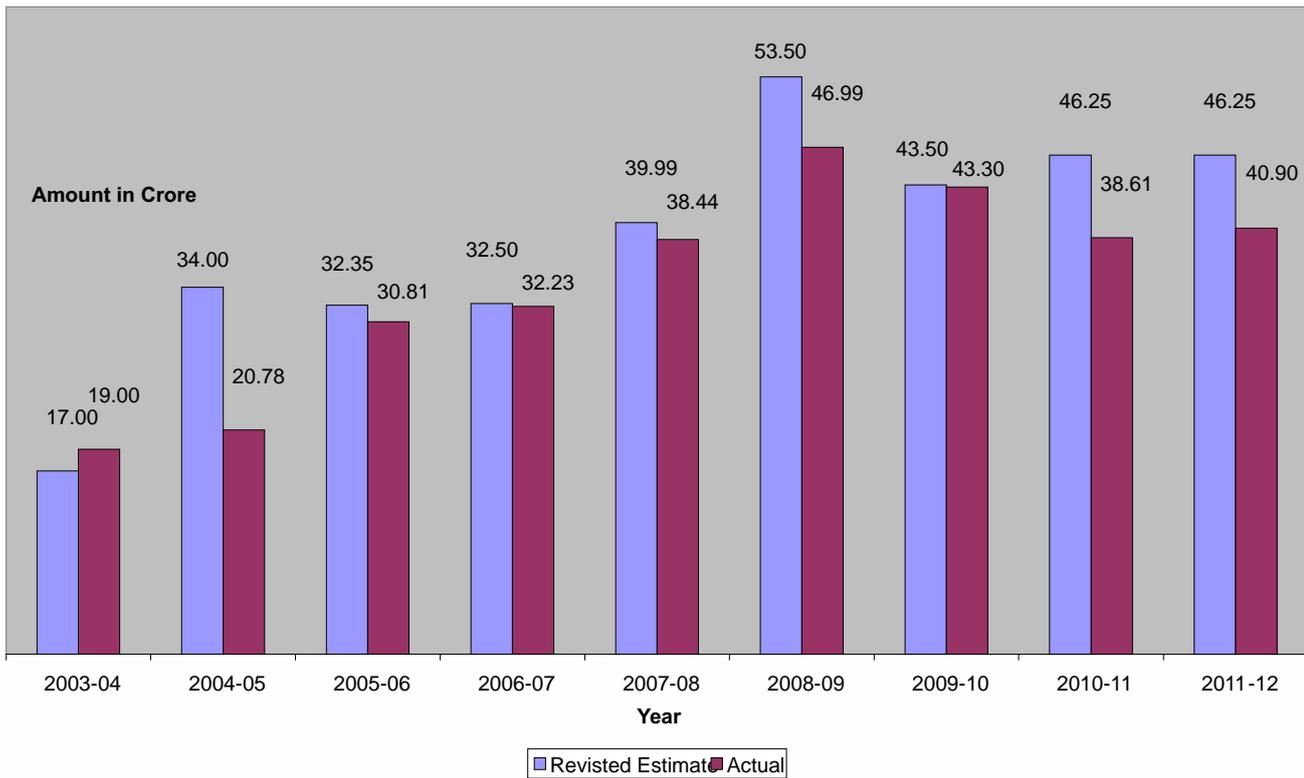


Fig.-61. Budget allocation and Progress of Expenditure

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2011-12 was organised by 'The Energy Resource and Institute (TERI), New Delhi

- Knowledge Park on the occasion of World Environment Day 2011 was organised by the Centre for Environment Education (CEE), New Delhi.

**Progress/Achievements made during the year**

- 99,063 Eco-clubs supported during 2011-12 (as on 7<sup>th</sup> March, 2012).
- Record level of financial assistance of Rs. 12.12 crore approved under NEAC.
- Number of participating organisations in NEAC reached an all time high of 14,297.

**Comparison of progress during the year**

Progress made in supporting Eco-clubs under NGC since 2003-04 is shown in Fig.-58.

The number of participating organisations in NEAC rose from 115 during 1986-87 to 14,297 during 2010-11. (Fig.-59)

**State-wise status**

- Number of eco-clubs established in States / UTs since 2004-05 is given in Table-46.
- A detail of financial assistance released under the NGC programme is given in Table-47.
- Amount sanctioned under NEAC programme since 2004-05 is given in Table-48.

**Implementing organisations along with details**

The National Green Corps Programme is implemented throughout the country through State Nodal Agencies. A list of nodal agencies in States/UTs is at Table-IV. The Regional Resource

Agencies help the Ministry in conducting, supervising and monitoring the NEAC activities throughout the country.

### Budget Allocation

The budget allocation of the scheme and progress of expenditure is given in Fig.61.

**Table-46.** No. of Eco-clubs established under the NGC Programme (since 2004-05)

State/UT	No. of Eco-clubs							
	2011-12*	2010-11	2009-10	2008-09	2007-08	2006-07	2005-06	2004-05
Andhra Pradesh	5750	5750	5750	5750	5750	5750	3900	3900
Arunachal Pradesh (NE)					525			
Assam (NE)	5207	5207	5207	4695				
Bihar	8871	8971	8971	8473	7200		5266	5700
Chandigarh (UT)				115	113	112	110	
Chhattisgarh	4000	3932	3932	3932	3932	4000	2373	2400
Dadra & Nagar Haveli (UT)								
Daman & Diu (UT)								
Delhi (NCT)	1796	1796	1874	2000	1600	1600	1500	1500
Goa			500		500	500	441	300
Gujarat		6750	6750	6500	6500	6250	3750	3750
Haryana	5250			5000		5000	2850	2750
Himachal Pradesh	3000			3000		1693	1800	1800
Jammu & Kashmir				5500				
Jharkhand	2842							3300
Karnataka				8000	8000			4800
Kerala	3500	3500	3500	3500	3500			2100
Lakshadweep (UT)								12
Maharashtra	8905	8905	8898	8898	8844	8844	5400	5400
Manipur (NE)	1750				1350	1350		900
Meghalaya (NE)								
Mizoram (NE)			1235	1235	1235	1200	1200	1200
Madhya Pradesh	12500	12500	12500	12000	12000	7200	7200	7200
Nagaland (NE)	2280	2275	2227		2048	2107	800	800
Orissa	7500	7500	7500	7500		5900	4500	4500
Puducherry (UT)				550	550		513	513
Punjab	5000	5000	5000	5000	5000	4250	2550	2550
Rajasthan	8250	8000	8000	8000	8000	8000	4800	4800
Sikkim (NE)							540	
Tamil Nadu	8000	7500	7500	7500	7500	7500	4500	4500
Tripura (NE)	750			600	600	600	600	600
Uttar Pradesh						10747	10500	
Uttaranchal					1950			
West Bengal	3912		3912	4750	4750	4750	2850	2850
<b>Total</b>	<b>99,063</b>	<b>87586</b>	<b>93256</b>	<b>112844</b>	<b>91447</b>	<b>87353</b>	<b>67943</b>	<b>68125</b>

\* as on 07.03.2012.

**Table-47.** Details of Financial Assistance Released to Eco-clubs under the NGC Programme (since 2004-05)

S.	STATE/UT	2011-12*	2010-11	2009-10	2008-09	2007-08	2006-07	2005-06	2004-05
1	Andhra Pradesh	15697500	15697500	15697500	15697500	15697500	15466250	10325000	4922500
2	Andaman & Nicobar Islands (UT)				896112				
3	Arunachal Pradesh (NE)						1620929		
4	Assam (NE)	14102125	14377125	13163586	12313583				
5	Bihar	24283875	24546375	24330707	23080000	19598456		13393300	6191923
6	Chhattisgarh	10911500	10741500	10741500	10741500	10741500	10715207	6304150	2940000
7	Chandigarh (UT)				324529	322750	303338	264650	
8	Dadra & Nagar (UT)								
9	Daman & Diu (UT)								
10	Delhi (NCT)	4950750	4791182	4681243	4887587	4066733	4237079	3665134	1258491
11	Goa			1287721		1323190	1357625	1158021	353158
12	Gujarat		18372375	18395000	17745000	17712500	16750000	10082640	3289268
13	Haryana	14300000			13242978		13242978	6594998	740000
14	Himachal Pradesh	8107976			7877425		4391975	4735777	2152205
15	Jammu & Kashmir				14300000				
16	Jharkhand	3507481							3343673
17	Karnataka				18648000	23189957			1396046
18	Kerala	9555000	9450000	9447375	9439500		9119252		1221850
19	Lakshadweep (UT)							26299	
20	Madhya Pradesh	34125000	34125000	34060000	32760000	32160000	20160000	19620000	8793750
21	Maharashtra	23714781	23718362	23709110	23635348	23253249	23730000	14715000	6300000
22	Manipur (NE)	4780000				3663018	3663018		450,000
23	Meghalaya (NE)								
24	Mizoram (NE)			6903750		3447500	3128200	3128300	1150814
25	Nagaland (NE)	6273125	12097125	539500		5247500	5652500	2256044	400000
26	Orissa	20193734	20474511	20228019	20275000		16100000	12235225	5250000
27	Puducherry (UT)				1519640	1477270		1301567	524973
28	Punjab	13650000	13650000	13650000	13650000	13552500	11390000	6948750	2975000
29	Rajasthan	22522154	21840000	21837661	21725002	21440000	21440000	13080000	5452540
30	Tamil Nadu	21744654	20475000	20361310	20327027	20107802	20099609	12080000	5154797
31	Tripura (NE)	2055000			1680000	1680000	1680000	1600000	735000
32	Sikkim (NE)							1025000	
33	Uttarakhand					5111829			
34	Uttar Pradesh						9683084	19100000	
35	West Bengal	10767750		10872500	13585000	12350000	12730000	7766250	4660543
	Total	265242405	244356055	249906482	298350731	236143254	226661044	171379806	69682830

\* as on 07.03.2012.

**Table-48.** Amount Sanctioned under NEAC

S. No.	State/UT
1	Andhra Pradesh
2	Andaman & Nicobar Isla
3	Arunachal

Note: During 2003-04 to 2006-07 amount released under NEAC for Haryana & Chandigarh was combined. From 2007-08 onwards Chandigarh is clubbed with Punjab.

## National Museum of Natural History

### Introduction

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. The Museum also undertakes many outreach programmes such as Temporary Exhibitions, Mobile Exhibitions and a large number of Nature Camps. It also organises many competitions leading YEYA (Young Environmentalist of the Year Award).

In order to expand the geographical coverage of its activities, the NMNH has established a few Regional Museums of Natural History (RMNH) in South India (Mysore) in 1995, Central India (Bhopal) in 1997 and Eastern India (Bhubaneswar) in 2004. RMNH are also being established for Western India (Sawai Madhopur) and North-Eastern India (Gangtok).

### Progress of Activities undertaken

**Educational Activities:** NMNH and its RMNH organised a number of in-house and outreach programmes for the benefit of school children, college students, teachers, differently abled children and general public. Various national and international days of scientific relevance like World Wetland Day, World Day for Water, World Forestry Day, International Ozone Day, Conservation Day, Earth Day, Environment Day, World Heritage Day, International Bio-diversity, Wildlife Week,

were observed and different programmes for school children and challenged children were also organised. It also organised different educational activities and competitions like Quiz, Declamation, On-the-spot Painting, Poster Making, Slogan writing, Essay writing, Model making, Bird Watching and Tree-spotting for the participating students on these occasions.

**Publications:** NMNH and its RMNH published a number of publications in English, Hindi, Kannada and Oriya on the topics related to animals, plants, biodiversity and other environment related issues. A special desk calendar was printed on the prize winning entries of different contests organised by the Museum. It also published posters and booklets including the Summer Programme magazine, on topics related to nature and environment.

### Temporary Exhibitions

- NMNH New Delhi: The NMNH was involved in organizing an exhibition on Biodiversity as part of the launch of United Nations Decade on Biodiversity for Asia and Pacific organized by Ministry of Environment & Forests, Government of India on 23<sup>rd</sup> May 2011. A temporary exhibition on "Biodiversity of Western India" was launched at the Zoological Survey of India (ZSI) Jodhpur from 28<sup>th</sup> September to 2<sup>nd</sup> October 2011. The exhibition highlighted the concern about sustainable development and global concern on environmental issues and Indian tradition of conservation.

A temporary exhibition on "Sustainable Living" was organised on 25<sup>th</sup> & 26<sup>th</sup> November 2011 at Lalit Hotel New Delhi.

A temporary exhibition on "Intangible Natural Heritage" is under the process of development in the 4<sup>th</sup> Floor Gallery of NMNH.

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- RMNH Bhubaneswar- Exhibition on Wheels: The Exhibition on wheels on the theme Forest Wealth was on display at Khordha Zilla Lok Utsav organized by Aswasana, a Socio-Cultural & Economic Re-Construction Organization, Khordha from 18<sup>th</sup> to 25<sup>th</sup> April 2011. About 20000 people visited the exhibition. Exhibition on wheels was sent to Govt. High School, Tomando, Khurda along with specimens and models of animals for interaction with the students on 22<sup>nd</sup> October, 2011. Exhibition on wheels was on display 12<sup>th</sup> to 16<sup>th</sup> November, 2011 in Balasore and Jajpur districts of Odisha. About 15578 school children and general public from 22 schools visited the exhibition.
- RMNH Bhopal: Regional Museum of Natural History, Bhopal inaugurated a temporary exhibition on 'Extinct and Threatened Animal of India' on Oct. 1, 2011 coinciding the Wildlife Week. In this exhibition there were 24 exhibits like Lesser Florican, Bengal Florican, Rock Python, Reticulated Python, Magar, Gharial, Rhinoceros, Wild Ass, Pangolin, Mouse Deer, Sloth Bear, Nilgiri Tahr, Swamp Deer, Marble Cat, Red Panda, Clouded Leopard, Indian Cheetah, Bison and Wild Buffalo depicted. This exhibition was kept opened for public upto 30<sup>th</sup> October, 2011. RMNH, Bhopal operated an information center and exhibited "Pangolin" at Science Fiesta held at Regional Science Center, Bhopal during 10-11<sup>th</sup> November, 2011.
- RMNH Mysore: A travelling exhibition on "Biodiversity of Western Ghat" was developed as a part of International Year of Biodiversity (2010) and inaugurated by Shri Jai Ram Ramesh, the Honourable Minister of State (independent charges ) for Environment

and Forests', Govt. of India on 4<sup>th</sup> June 2011 at Indian Institute of Wood Science & Technology, Bangalore.

### Workshops/Conference/Seminars

- NMNH New Delhi: A three day work shop (9<sup>th</sup> to 11<sup>th</sup> August 2011) for trainee teachers of DIET Daryaganj was organised in association with NCERT. Seminar on "Exhibit development on Intangible Natural Heritage" was organised in Jodhpur from 28<sup>th</sup> to 30<sup>th</sup> September 2011 and Paper presentation was given by ZSI, BSI and University of Jodhpur

The NMNH organised a "Festival of Museums & Intangible Natural Heritage" in Kalady from 22-27 June 2011.

A two day workshop with trainee teachers of DIET Daryaganj was organised for planning of new Biology kits for Primary level on 20<sup>th</sup> & 21<sup>st</sup> Oct. 2011. The purpose of the workshop was to explore the conceptual ideas to develop prototypes for new Biology Teaching kits to teach Environment Science in schools at primary level.

A two day National workshop on Environmental Education in Museums and Formal Educational Institutions was held on 18<sup>th</sup> and 19<sup>th</sup> February 2012 in collaboration with Department of Museology, Aligarh Muslim University, Aligarh.

### Meeting of the Advisory Committee

- The 4<sup>th</sup> Meeting of the Advisory Committee of the NMH under the Chairmanship of Dr. C.R Babu, Emeritus Professor was convened on 25<sup>th</sup> October 2011.

### Film Shows

- Regular film shows were arranged for visitors in National Museum of Natural History, New Delhi and its RMNH at

Mysore, Bhopal and Bhubaneswar to sensitize and create awareness among general visitors on issues of nature and environment.

### Collaborative Programmes

- NMNH New Delhi: NMNH in collaboration with Hindustan Times organized annual Inter-school essay writing competition. The winners of the competition were taken to Arawali Biodiversity Park, Delhi for Nature Study Tour.
- RMNH Bhopal: The International Biodiversity programme was organized by RMNH, Bhopal in collaboration with M. P. Biodiversity Board, Bhopal on 22 May, 2011. Shri A. P. Dwivedi, Former PCCF of Madhya Pradesh was the chief guest and Shri Shyam Bohre, Social Activist was special guest.
- Centre for Environment Education (CEE), Bhopal organized two days workshop for NGO partners during 9-10<sup>th</sup> August 2011 collaboration with RMNH, Bhopal. The theme of the workshop was "Paryavaran Mitra".
- RMNH Bhopal organized a programme on "Bats, Biodiversity and Part of Biodiversity" for the student of class 9 – 12 at Pragya School, Bhopal on Oct. 18, 2011 and a programme on "Bear, Forests and Biodiversity" and "Elephant Etiquette" organized for the students of class 5<sup>th</sup> – 8<sup>th</sup> on 20<sup>th</sup> October, 2011.

- RMNH Bhubaneswar: Organizing Committee Meeting of Odisha Environment Congress-2011 was held from 22<sup>nd</sup> to 24<sup>th</sup> December-11 on the focal theme "Forest Resources of Odisha-Issues, Challenges and Potentials" was held on 13<sup>th</sup> July & 30<sup>th</sup> October, 2011.- under the chairmanship of Shri Vinod Kumar, IFS, PD, OFSDP. This congress is jointly organized by RMNH, Centre for Environment and Development, Human Development Foundation and Dept. of Forest and Environment, Govt. of Odisha.

### Earth Day

- On the occasion of Earth Day a National Level "Poster design competition" was conducted in NMNH New Delhi and its RMNH in Mysore, Bhopal, Bhubaneswar and Sawai Madhopur on 22<sup>nd</sup> April 2011 for the students of class IX & X to select the candidate for the Young Environmentalist of the Year Award-2011". The theme of the contest was "Forests: Nature at your service".



Fig-62. Summer programme participants at cactus garden in RPRC

### World Environment Day

- NMNH, New Delhi World Environment Day and the 33rd Anniversary of the NMNH Foundation Day were observed on 05 June, 2011. The function was organized at the Ashok Hotel, New Delhi. Shri Jai Ram Ramesh, Hon'ble Minister, MOEF, was the Chief Guest at the function. Ms Rashmi Bathom a student of class Xth from Komal Higher Secondary School Bhopal was decorated by the Shri Jairam Ramesh, Hon'ble Minister, MOEF as the Young Environmentalist of the year 2011. The function was a great success.
- RMNH Bhubaneswar: On the occasion of Valedictory function of Summer programmes on 5<sup>th</sup> June, 2011, prizes and certificates were distributed to the participants of Green Teens, Green Cubs and YEYA Poster making competition.
- RMNH Mysore: Invocation by the participants of summer vacation programme 2011, Lecture on "importance of environment and medicinal plants in our daily life". Dr. Javeed Nayeem, Chief Guest, released the Flyers prepared for Earth Day and Environment Day followed by his talk on the conservation of environment. Prizes distributed to the winners of SVP-2011 and YEYA 2011
- RMNH Bhopal- Regional Museum of Natural History (RMNH), Bhopal organized World Environment Day - June 5, 2011. Shri S. S. Rajput, CCF, Bhopal Circle, Govt. of Madhya Pradesh was the Chief Guest. The Participants of poster making competition and summer vacation programmes attended the session along with their parents. The Chief Guest, Shri S. S. Rajput distributed the prizes and certificates to the winners of poster making competition and participants of summer vacation programmes.

- RMNH Sawai Madhopur- Prize distribution Function was held on 5<sup>th</sup> June, 2011 for the programme called National Science Day (Written Quiz), Poster Design Contest & Competitions held during Summer Programme.

### Van Mahotsava 2011

- NMNH New Delhi: Van Mahotsava 2011- A special programme ("Importance of plants" in the network of Nature through the exhibits of photosynthesis, food chain, Man & Nature, Two faces of forest, etc.) was organised for the under privilege children of Khusi Centre for Rehabilitation & Research (NGO) also an outreach programme "make birds and animal shape out of clay" for specially challenged children of Anchal NDMC School for Mentally Retarded and Hearing Impaired was organised.
- RMNH Bhubaneswar- The museum celebrated Van Mahotsav on 7<sup>th</sup> July, 2011 through planting of sapling of 50 different species in the campus.

### International Ozone Day

- NMNH New Delhi: On 16<sup>th</sup> September 2011 on the occasion of "International Day for the Preservation of Ozone Layer an On-the-Spot" Nature Painting Contest" was organised for the school students from classes (IX to XII) on the theme: "For the life on Earth-Protect the Ozone Layer and Prevent Climate Change". The teachers accompanying the students were taken around the Museum galleries and shown the nature and wildlife related film in the museum auditorium.
- RMNH Mysore- Power point presentation on Ozone, Film Show on Environment, Painting Competition & Lecture was conducted in Srirangapatnam instead of Museum premises and got good response from the school students and local public.

- RMNH Bhubaneswar: A quiz competition was organized for the student of class VIII to X to mark the celebration of 17<sup>th</sup> International Day for Preservation of Ozone Layer-2011 on 16<sup>th</sup> September 2011. The quiz consisted of wide variety of questions to generate awareness about the importance of preservation of ozone layer.



Fig-63. Outreach programme

- RMNH Sawai Madhopur: Poster Design contest was held on the occasion of International Day for the preservation of Ozone Layer on 16<sup>th</sup> September, 2011 for the Students of IX and X Class.

### Wildlife Week

- NMNH New Delhi: An outreach programme for under-privileged children in the age group 8-14 years was organised on the occasion of Wild Life Week on 7<sup>th</sup> & 8<sup>th</sup> October 2011. The purpose of the programme was to bring awareness among children about wildlife in India and help them understand basic concepts of Environment and Biodiversity through visits to Museum galleries and Delhi Zoo.
- RMNH Mysore: Painting competition on wildlife, Film shows on Environment, Ecology and Wildlife Programme organised for rural Higher Primary School students of Chinakuruli Govt. Girls High School on 1<sup>st</sup> Oct, 2011 and on 3<sup>rd</sup> Oct., 2011 at Panadavapura, Model Higher Primary School, PU College

premises during "Wildlife Week".

- RMNH Sawai Madhopur: Different Activities such as Painting Class, Modelling / Sculpture Class and Documentary Films on Environment were shown to students/Public during the "Wildlife Week".
- Winter Programme: NMNH organised Winter Nature Camps for Children during 1<sup>st</sup> January to 15<sup>th</sup> January 2012 in various venues (New Delhi, Mysore, Bhopal, Bhubaneswar and Sawai Madhopur).

### Special Programme for Specially Challenged Children

- NMNH New Delhi: Essay writing in Braille, declamation contest for visually challenged students were organized in the month of January 2012. A week long programme for Specially Challenged Children includes nature painting competition for hearing impaired, clay modelling for physically challenged and collage painting and animal – bird mask making for mentally

challenged organised in the month of February 2012.

To commemorate "International Day for Disabled" (3<sup>rd</sup> December) an outreach programme for specially challenged children were conducted at Handicapped Welfare Federation and Institute for the Blind, New Delhi.

To mark "World Wetland Day" an outreach programme organised on 2<sup>nd</sup> Feb. 2012 for specially challenged children. They were taken to National Zoological Park, New Delhi to watch the migratory birds.

- **RMNH Mysore:** Painting Competition, Singing Competition, Modelling Competition, and Museum Visit for 10 days, Prize Distribution Function organised during the month February 2012.

Special Nature Camp for children with hearing impaired was organised from 4<sup>th</sup> to 7<sup>th</sup> June, 2011 at Bannerghatta National Park, Bangalore.

- **RMNH, Bhopal:** Celebration of 14<sup>th</sup> Anniversary programme on 29<sup>th</sup> September, 2011. Dr. Pramod K. Rai, Retd. Professor was the Chief Guest of the programme. Two plants of endangered *Cycas circinalis* were planted in the Dinosaur Park by the Chief Guest. General visitors, invitees and all members of staff were present during the programme. News coverage was covered by print and electronic media.

- **RMNH Bhubaneswar:** Celebration of 7<sup>th</sup> Anniversary day: The museum celebrated its 7<sup>th</sup> Anniversary on 10<sup>th</sup> August, 2011. Shri J.K. Tiwari, IFS, Chief Conservator of Forests, MoEF, Eastern Regional Office, Bhubaneswar was the Chief Guest. Dr. Chitta Ranjan Mishra, Sr. Scientist, Author and Science Popularizer and Dr. Palok Aich,

Chairperson, School of Biological Sciences, NISER, Bhubaneswar were the Guests of Honour. As part of the 7<sup>th</sup> Anniversary programme, the museum conducted painting competition in three groups for the students of Class-I-X. Similarly written quiz competition was also conducted on the same day Winners were awarded prizes and certificates during the 7<sup>th</sup> anniversary function.

### Reserve collection enrichment

- RMNH Bhubaneswar- Skeletons of three nos. of dead Emu bird were collected from the local Emu farm situated at Baliana, Bhubaneswar and under process for further preservation and display. Wet preservation of 3 dead Golden Fish from in-house aquarium. Some fish species collected from fluoride affected areas of Nayagarh district were identified and preserved.

### Inauguration of North East Biodiversity Gallery

- RMNH, Bhubaneswar-The Hon'ble Chief Minister of Odisha, Shri Naveen Patnaik inaugurated a new gallery on North East Biodiversity in the Regional Museum of Natural History, Bhubaneswar on 1<sup>st</sup> June, 2011 in the presence of Shri Jairam Ramesh, Hon'ble Minister of State (Independent Charge) for Environment and Forests, Govt. of India, Shri Debi Prasad Mishra, Hon'ble Minister, Forest and Environment, Government of Odisha, Prof. P. Mohanty Hejamdi, Chairperson, Advisory Planning Committee, Regional Museum of Natural History, Bhubaneswar, Dr. G.V. Subrahmanyam, Advisor in the MoEF and Dr. B. Venugopal, Director, NMNH, New Delhi. During the occasion, museum brochures and brochures on North East Biodiversity gallery (Oriya and English) were released.

### Skeleton display of baleen Whale

The 47 ft. Long skeleton of baleen whale collected from Gopalpur on sea was processed and preserved. The articulation of the skull, vertebrae, ribs and all other bones is being completed and the showcase for the display is completed.

### Summer Vacation Programmes

- NMNH New Delhi- The summer vacation programme was organised from 18<sup>th</sup> May to 31<sup>st</sup> May 2011 for the student of class VII to X (green teens) and for the student of class Vth to VII (green cubs) in which 60 student from all over Delhi & NCR participated. The programme included Lectures, Slide/CD presentation on our Natural Heritage, working with microscope, talk on Forest-Nature at your service, Nature Quiz, and interactive writing session on nature and environment, talk/slide presentation on Wonders of Ocean, visit of Aravalli Biodiversity Park, art out of clay on potter's wheel, preparation of nature magazine and nature study tour to Botanical Garden Noida etc.
- RMNH Mysore- Green teens organised for the class 8-10 students from 2<sup>nd</sup> to

12<sup>th</sup> May 2010. Summer programme Green Cubs organised for the class 5-7 students from 18<sup>th</sup> to 30<sup>th</sup> May 2010.

- RMNH Bhopal- RMNH, Bhopal organized a summer vacation programmes" Green Teens" and "Green Cubs" from 18<sup>th</sup> May to June 5<sup>th</sup>, 2010.
- RMNH Bhubaneswar- The Summer Vacation Programme was held from 11<sup>th</sup> May to 20<sup>th</sup> May 2010 for two groups i.e. Green Teens (Std. VIII-X) & Green Cubs (Std. V-VII). The programme included orientation to the museum facilities and programmes along with thought provoking and hands on activities in the museum and outside the museum with field visits to sanctuaries, parks, gardens and laboratories accompanied by expert interactions and demonstrations.
- RMNH Swai Madhopur-Summer vacation programme of Green Teens of Class (8<sup>th</sup> -10<sup>th</sup> ) and Green cubs of Class (5<sup>th</sup>-7<sup>th</sup>) were organised from 1<sup>th</sup> to 16<sup>th</sup> May 2010. The participants were taken to Ranthambore National Park for study of nature and wild life.

### Forestry Education, Training and Extension

The present system of forestry education and training is tailored to produce skilled forest managers to manage, protect and conserve the forests in consonance with National Forest Policy, 1988, forestry action programmes etc. The activities related to forestry education, training and extension are performed by the different institute of the Ministry like Indira Gandhi National Forest Academy (IGNFA), Dehradun; Directorate of Forest Education (DFE), Dehradun; ICFRE, Dehradun; IIFM, Bhopal; IPIRTI, Bengaluru.



Fig-64. Nature Study Programme

## Progress of activities undertaken by various institutes

### Indira Gandhi National Forest Academy (IGNFA), Dehradun

Indira Gandhi National Forest Academy is the training centre of IFS Officers. The institution undertakes training of new recruits to the Indian Forest Service which is spread over a period of 20 months. Besides this, the institution also undertakes training of IFS Officers at various years of seniority and also of other Stakeholders. The Academy is a part of FRI campus in Dehradun. This institution earlier functioned as Indian Forest College from 1938-1987. In 1987, when the Indian Council of Forestry Research and Education (ICFRE) was established as an autonomous institution, the Indian Forest College was named as Indira Gandhi National Forest Academy (IGNFA) in recognition of contribution of the late Prime Minister to the forestry sector in the country. The IGNFA functions as an institution directly under the control of Ministry of Environment and Forests.



Fig-65. IFS trainees of 2011-12 during the Parliamentary Appreciation Course

## Activities during the year

### Mid-Career Training Programme

- Started in the year 2009-10, the Academy this year has conducted Mid-Career Training Programmes. While one Phase-III programme for Officers of 7-9 years' of service was completed and one Phase-V programme which commenced in March, 2011 concluded this year. Two more Phase-V programmes and one Phase-IV programme was conducted this year.
- Both the batches i.e., 2009-11 and 2010-12 Courses underwent Indian Military Academy attachment for Weapons' Training, Horse-riding and Swimming.

### The Convocation of 2009-11 batch

- The 2009-11 batch of Indian Forest Service Officers passed out in Aug. 2010. The Convocation Ceremony was held on 17<sup>th</sup> Aug. 2011, in Convocation Hall of FRI building. The Chief Guest for the function was the Secretary, Ministry of Environment and Forests and Director-General of Forests and Special Secretary to the Government of India Presided over the function. As done last year, this year award of 'Hari Singh Fellows' was given to five shortlisted Probationers for pursuing specialization in wildlife/Tree-breeding and Genetics and Remote Sensing and GIS.

### Coordination Training Programmes

- During the current year, IGNTA undertook three coordination training programmes for the three All India Service Officers. The four days' training programmes for IAS, IPS and IFS Officers included one day field visit to Rajaji National Park. These training programmes were well received.

### 2010-11 of IFS trainees

- Two members of this batch resigned to join other services. The batch size is currently 74. The Probationers, apart from undergoing regular training in the Academy, undertook Hill Tour, West India Tour, South India Tour and Parliamentary appreciation Course. During the Parliamentary appreciation Course, they called Her Excellency, the President of India and some photographs are enclosed. They would be undertaking East and West India Tours and Working Plan Exercise.

### Induction Training

- Induction training of forest officers inducted into the Indian Forest Service by promotion from State Forest Service is scheduled to begin from 26<sup>th</sup> of December, 2011.

### Reunion of Old batches

- One reunion workshop for the forest officers 1981 was held in the Academy in June 2011. In this workshop, the 'Green India Mission' was discussed and the Probationers interacted and benefitted from the experiences of senior officers.

### Training of members of Higher Judiciary and Indian Revenue Service Officers

- A three day sensitization course members of higher judiciary was held in the month of November-December, 2011 in which

24 members from various parts of the Country participated. The training was well received. One four day orientation course for Indian Revenue Service Officers is scheduled to be held in the month of March, 2012.

### New Batch of 2011-13 Course

- 58 Probationers of Indian Forest Service joined the three Academies viz., Academy of Administration, Bhopal, Dr. Marri Chenna Reddy Institute, Hyderabad and National Academy of Direct Taxes for Foundation Course as per the orders of Department of Personnel and Training. Offers of appointment has been issued to two more candidates to join directly the Professional Course in this Academy. This batch would undergo Indian Military Attachment for Horse-riding, Weapons Training and Swimming and would also undergo Introductory Tour.

### Directorate of Forest Education (DFE), Dehradun

#### Introduction

The Directorate of Forest Education (DFE) under the Ministry is responsible for imparting professional/technical training/education in the Country to the State Forest Service (SFS) Officers and Forest Range Officers (FROs). The Directorate also supplements the efforts of various States for the training and capacity building of the Forest Frontline Staff (Deputy Rangers, Foresters and Forest Guards) through the respective Forest Training Institutes. There are three Academies and One College under the Directorate and the names and intake capacity (Per batch) of these colleges is as under :

- Central Academy for State Forest Service, Dehradun 40
- Central Academy for State Forest Service, Coimbatore 40

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- Central Academy for State Forest Service, Burnihat 40
- Eastern Forest Rangers College, Kurseong 30

### Objectives

- To cater to the training needs of SFS Officers and FROs of States/ Union Territories in the country.
- To ensure standard and quality of training being imparted to SFS Officers and FROs.
- To develop appropriate and relevant training contents and evaluation standards for forestry training at various levels.
- To suggest training policy for effective Human Resource Management and Development.
- To supplement the efforts of State Governments in the training of Forest Frontline Staff (Forest Guards, Foresters and Deputy Rangers)

### Activities undertaken/ achievements during the year

- Induction training in the form of "Two year Diploma Course" for the newly recruited SFS Officers of various States/ Union Territories has been undertaken. One batch (course 2010-12) & Two batches (course 2011-13) of newly recruited SFS Officers are undergoing training at Central Academy for State Forest Service (CASFOS), Dehradun and Coimbatore and one course 2012-14 SFS will commence from 5<sup>th</sup> January, 2012.
- Two batches (Course 2009-2011) of newly recruited SFS officers passed out from CASFOS, Dehradun and CASFOS, Coimbatore.
- Induction training in the form of "Eighteen months certificate course" for the newly recruited FROs of various states/Union Territories has been undertaken. One

batch (course 2010-12) and one batch (course, 2011-13) are undergoing training at CASFOS, Burnihat.

- Two batches of newly recruited FROs (Course 2010-11) passed out from CASFOS, Burnihat & CASFOS Coimbatore.
- Four General Refresher courses, each of two weeks duration, were conducted for in-service SFS Officers at CASFOS, Dehradun, Burnihat and Coimbatore.
- One General Refresher Courses, each of two weeks duration, was conducted for in-service FROs at Eastern Forest Rangers College, Kurseong.
- Two Computer Application courses in Forestry, each of two weeks duration, were conducted for in-service SFS Officers/FROs at CASFOS, Burnihat and Eastern Forest Rangers College (EFRC), Kurseong.
- Eight Workshops, each of one week duration, on Wildlife Management / Community Forestry and JFM/Training of Trainers/Legal issues in Forestry and Wildlife/Wildlife Management/ Human Resource Management/Wildlife Management and Policy & Legal Issues for in-service SFS Officers/FROs at CASFOS, Dehradun/Coimbatore and EFRC, Kurseong.
- One theme based course in Wildlife management of two weeks duration for in-service FROs was conducted at Eastern Forest Rangers College, Kurseong.
- Seventy three General Refresher Courses, each of two weeks duration, were conducted for in-service Forest Frontline Staff (Deputy Rangers, Foresters & Forest Guards) through 49 Forestry Training Institutions of 29 states.
- Two Theme based workshop of one week duration was conducted for in-

- service FROs through State Forest Training Institute.
- One "Two week Training on Combating Desertification and Climate Change" for India Africa Forum Sponsored by Ministry of External Affairs, Government of India, New Delhi conducted at CASFOS, Dehradun.

### Training of IFS Officers

The thrust of this scheme is on capacity building of the Indian Forest Service Officers through organizing mid-career short-term refresher courses. During the year, the Ministry sponsored 27 one-week courses in the premier training/management institutions in the country on a wide range of disciplines including management and administration of forests, wildlife, environment and general administration in the government. The topics are:-

1. Joint Forest Management: Challenges and Opportunities
  2. Application of Remote Sensing and GIS in Forestry
  3. Environmental Economics and Accounting
  4. Application of Remote Sensing, GIS in Effective Forest Planning and Management
  5. Development of Clean Development Mechanism Projects under Land Use, Land Use Change and Forestry: Theory and Practice and their Relevance to Forestry Sector
  6. Forest Genetic Resource Management
  7. New Tool and Techniques for Preparation of Working Plan for Integrated Forest & Biodiversity Management and its Implementation.
  8. Forest and Climate Change: Opportunities and Challenges of Adaptation and Mitigation
  9. Collection, Compilation, Validation and Dissemination of Forests Statistics
  10. Ecotourism: Assessment and Development
  11. Financial Management & Audit Sensitization
  12. Increasing Productivity of Wood and Non-Timber Forest Produce (NTFPs) using Modern Technical Inputs.
  13. Forest Tribal Interface
  14. Natural Resource Management and Conflict Resolution
  15. Forest Certification: A Marketing Tool for Sustainable Forest Management
  16. Human Wildlife Conflict: Issues and Mitigation
  17. Bamboo Resource Development for Addressing Livelihood Concerns of Communities
  18. Integrated Approach for Sustainable Development of Fragile Desert Ecosystem
  19. Holistic Approach for Participatory Monitoring of Joint Forest Management
  20. Impact of Various Treaties, Conventions and International Institutions on Conservation and Management of Forests
  21. Environmental Impact Indicators and Valuation Techniques
  22. Wildlife Offences: Role of Intelligence Gathering and Wildlife Forensics
  23. Conservation and Development of Medicinal Plants and Benefit Sharing with Local Communities
  24. Microcredit and Microenterprise Management in Forestry
  25. Community Mobilization and Institution Building
  26. Good Governance
  27. Ecotourism vis-a-vis Conservation of Forests
- Besides this, two IFS officers have been sponsored to pursue long-term courses offered by the Indian Institute of Public Administration (IIPA), New Delhi and National Defence College (NDC), New Delhi.

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- During the year, the Ministry sponsored 7 two-day workshops on emerging topics in the field of forests, wildlife and environment conservation having regional, national and international importance. The training workshops/seminars are sponsored in the premier institutions/organizations depending upon their expertise and strengths in a particular field/ discipline.
- Participation in the training courses/ training workshop has been satisfactory.
- The Budget allocation during 2010-11 of this scheme was Rs. 2.00 crore (Plan).

### Capacity Developmental Forest Management and Training of Personnel

This is an externally aided component aimed at improving training of frontline forestry force. This component will be in a project mode with financial support from JICA. The cost of the component is Rs. 225.00 crore for a period of five years. The loan component is of Rs. 206.00 crores and the rest is Central Plan component. The Project implemented in eleven States namely Assam, Arunachal Pradesh, Bihar, Chhattisgarh, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Uttarakhand, and West Bengal. The states have been selected based on certain criteria, including non-existence of any external aided project in the forestry sector in the concerned state and paucity of training infrastructure, during the project development stage.

For implementing this component there is a Steering Committee and a Central Project Monitoring Unit (CPMU) in the Ministry and a State Project Monitoring Unit (SPMU), one in each implementing State. The central PMU releases/reimburses funds to implementing States for their Annual Plans of Operation. The CPMU will utilize funds for activities such as Master trainings,

consultancies and monitoring, etc. The proposal has two major objectives:

- To strengthen infrastructure of the forestry training schools of SFDs by:
  - Improving existing State Forest Training Schools (SFTS)
  - Establishing new training Schools in those States that do not have one.
- To strengthen training of frontline forestry personnel through:
  - Syllabus revision.
  - Building up a pool of Master Trainers/Trainers.
  - Training of frontline forest force in the States

### Training of Personnel of other services

Personnel of Police, Revenue, Customs, Agriculture, Horticulture, Soil Conservation, Animal Husbandry, Tribal/Rural Development, Judiciary, Public Health Engineering etc., have an interface with forestry sector. Sensitization of these departments through in-service training of their personnel will be covered under this component. It is proposed to organize awareness programmes in the form of short-term trainings, study tours, seminars and workshops in the institutions under the government as well as in the private sector.

During the current financial year, ten courses to be organized for one-week, four days & three days at IGNFA-Dehradun and IIFM-Bhopal. The allocation during the current financial year is Rs. 1.00 crore (Plan).

### Training of other Stakeholders

Forest Management in India is in a transitory stage moving from traditionally centralized forest management to participatory forest management. In traditional system of control, regulations and policing the forests have alienated people from developing a sense of belonging to the forests. There is a need to sensitize all

stakeholders for conservation of these natural resources. As such, under this component, it is proposed to organize/sponsor a number of specially designed short-term courses, study tours, workshops and seminars on various aspects of forest and environmental conservation for different stakeholders which may include NGOs, students in educational institutions, nature clubs/eco-clubs, panchayats, elected public representatives, personnel from banking institutions, social activists, press and media persons etc.

During the current financial year, seven courses to be organized for four days & three days at IIFM-Bhopal. The allocation during the current financial year is Rs. 0.50 crore (Plan).

### Foreign Training of Forestry Personnel

Apart from the concurrent core forests issues, the present-day foresters have to deal with non-technical issues e.g. inter-sectoral policy and programme linkage. Also, the forestry personnel need to keep themselves abreast of the technological advances in the fast changing world to address the changing requirements of the developing societies as well as the various global, regional national and local environmental concerns. Presently there is no scheme for providing opportunities to forest officers, working in the States and under the CSS and non CSS posts of MoEF and the autonomous institutions of the MoEF, for undergoing courses/participating in study tours/workshops in foreign institutions organizations. This component, for foreign training of IFS, SFS and Range Forest Officers for providing opportunities to them to participate in international seminars, workshops and study tours on emerging issues and challenges in forestry sector, is therefore proposed.

During the current financial year, three officers have been nominated to attend. The allocation during the current financial year is Rs. 1.00 crore (Plan).

## Indian Institute of Forest Management (IIFM), Bhopal

### Brief Objectives

The Institute, as a sectoral management institute, imparts education in forest management, which is a judicious mixture of forestry, social, and management science. The Institute constantly endeavours to keep in touch with the problems of people, especially the forest dwellers and undertakes need-based research. The Institute tries to serve as a reservoir of knowledge in the area of forest management and ensures proper integration of external and indigenous knowledge suitable to Indian context.

### Post Graduate Diploma in Forest Management (PGDFM)

The two year fully residential post graduate programme leading to the award of the Post Graduate Diploma in Forestry Management (PGDFM) was launched in July 1988. Students with diverse academic backgrounds from all over the country are groomed to meet the managerial requirements of the corporate and development sectors. The structure of the programme has been designed to ensure that the skills acquired are put in application during the course itself. The programme is designed to produce young managers who are sensitive to both natural and social environment.

The students who have successfully completed the programme are awarded the 'Post Graduate Diploma in Forestry Management' at the annual convocation in April every year. The PGDFM is recognised by All India Council for Technical Education (AICTE) and equated to a corresponding Masters Degree of Indian University by Association of Indian Universities (AIU).

The admission to this course is through CAT (Common Admissions Test) being conducted by IIMs followed by Group Discussion and Personal Interview (GD & PI)

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at IIFM. The candidates opting for a career in IIFM apply separately.

To address changing needs of the sector, the PGDFM programme was made broad based by introducing three major specialisation modules, viz., Conservation & Livelihood (C&L), Environmental Management (EM) and Development Management (DM).

The programme of PGDFM 2010-12 commenced from July 01, 2010 with 93 students selected out of 3255 applicants. Among these 93 selected students, 45 come under General Category; 14 belong to SC category; 07 belong to ST Category; 25 belong to OBC (Non-creamy) and rest 02 were admitted under PWD quota. The batch consisted of 13 female students. The students came from almost all the parts of the country. Following the general trend in the management education, in this batch also the engineers was the dominant group, consisting almost 57% of the total strength. This was followed by the graduate students of Science stream (22%), Commerce (9%), Arts (4%), Hotel/Food Technology (2%), Computer Applications (2%), Pharma (2%), Fashion Technology (1%) and Prosthetics (1%). The profile of the students reveals that they exhibit varied range of extracurricular interest and talent.

The admission announcement for 2011-13 batch was published in leading national dailies in August 2010. A total number of 1804 applications were received with CAT registration number. The CAT score was received from IIM for 1799 CAT appeared candidates.

Continuing IIFM's impeccable track record, the batch of PGDFM 2009-11 also achieved 100% placement. With participation of 67 companies in the placement process and making 175 job offers, 41 companies were invited for campus placement for the batch of 69 students. The 70 students of

PGDFM 2009-11 completed their summer internship during April 05 – June 11, 2010. The PGDFM 2010-12 batch received 152 summer internship offers from 55 organisations. The process for admissions to the PGDFM 2011-13 batch was initiated with announcement of the CAT examination in August 2010.

The PGDFM 2009-2011 programme was completed in March 2011. Sixty seven students completed the requirements for award of PGDFM diplomas. Another 88 Students of PGDFM 2010-2012 batch appeared for their end-term examination of Term-III held in March 2011.

On the recommendation of the faculty council, the Board of Governors (BoG) in its meeting held on March 29, 2010 approved the conferment of diplomas to 55 students of PGDFM 2008-2010 batch, 61 students of PGDFM 2007-2009 batch and 20 students of MRM 2007-2008 batch. The Board of Governors on the recommendation of the Faculty Council also approved the award of Chairman's Gold and Silver Medals to the eligible students for their scholastic performance in the respective batches.

### **M.Phil (Natural Resource Management)**

As per the decision of BoG, the process for initiating the M.Phil. (Natural Resource Management) programme was taken by the Institute to start the programme from the academic year 2011-12. It is envisaged that the programme will have the intake of 20 candidates with 10 candidates from in-service and 10 seats for non-service candidates.

The programme will comprise of two terms of class room teaching, one field study tour in the country, one foreign study tour and the dissertation work.

## Fellow Programme in Management (FPM)

The Institute initiated its doctoral level Fellow Programme in Management (FPM) 2011-15 during the academic year 2010-11. The FPM offers financial assistance and contingency grants to selected non-sponsored candidates. The programme is open to postgraduates from various disciplines and is designed to provide specialised knowledge, skills, and attitudes for positions requiring conceptual and application skills. The FPM programme aims to develop and equip students for career opportunities in management education and research.

The programme was widely advertised in national print media and the institute received 86 applications as on the last date of submission of applications, i.e. March 31, 2011.

## Ph.D. Programme

The Institute functions as one of the research centers of the FRI Deemed University for higher studies leading to Doctor of Philosophy.

## Training

The Institute has been organizing short-term training courses, seminars and workshops to transfer technical and managerial skills being generated by faculty areas of the institute. The focus of these programmes is on evolving, analyzing and synthesizing various management techniques/ tools, ideas and concepts relevant to the forestry and allied sector. During the year the institute conducted 33 Management Development Programmes, organised 23 workshops/seminars which include programmes conducted under externally funded projects like ICCF, ITTO and RCNAEB.

## Consultancy

The Institute completed two consultancy assignments and eight more are in progress.

Some of the client organizations for consultancy assignments include Haryana Forest Department; Tribal Welfare Department, Govt. of M.P.; M.P. State Employment Guarantee Council, Department of Panchayat and Rural Development, Govt. of M.P.; M.P. Forest Department; Department of SC/ST Welfare, Govt. of M.P.; Birla Corporation Limited, Satna; Environmental Planning and Coordination Organisation (EPCO), Bhopal; Andaman & Nicobar Forest Department, Haddo, Port Blair; Himachal Pradesh Forest Department, Shimla; Khadi and Village Industries Commission, Mumbai, etc.

## Publications

The Institute continues to disseminate its research findings to the larger audience through its own publications and also by publication of research papers in reputed journals, books and also by presentation of papers in national and international conferences. The faculty also participated and presented research papers in national and international conferences.

## Other Activities

The year 2010-2011 was marked by significant progress in different areas of academic activities. The Students Council of IIFM has also been very active during this year and organized number of academic as well as extra-curricular events.

## Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru

Training is an important tool to facilitate the industries for efficient utilization of man power resources, increase the productivity and reduce the overall cost of production. HRD needs of the mechanical wood industries are met by the Institute by conducting one year post graduate diploma course and short term vocational courses. Training enhances the professional competency of managers, supervisory staff and industrial workers. IPIRTI

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is the only training institute of its kind in the county in the field of mechanical wood industries.

### **Progress/Achievements made during the year**

#### **Energy Auditing and Carbon Footing in Manufacture of Bamboo Mat Corrugated Sheet (BMCS) and Bamboo Mat Ridge Cap (BMRC)**

One of the major component in housing is the roof. IPIRTI had evolved technology for the manufacture of Bamboo Mat Corrugated Sheets (BMCS) & Bamboo Mat Ridge Cap (BMRC) and it was found that there was a huge demand for these roofing materials.

Considering the green house gases effect, on the atmosphere which are the burning issues in today's world, there was a need to carry out energy auditing for BMCS & BMRC. The major contributing greenhouse gas emission is that of carbon dioxide and within this report all green house gas units are states as measure of carbon dioxide equivalent.

A higher concentration of green house gases means more heat is being trapped with earth's atmosphere raising the earth's surface temperature which leads to global warming. Global Warming is widely described as the greatest challenge in the history of human kind.

To adopt a planned approach for tackling the climate changes carbon foot print and Energy Audit Study is very important. This report has been designed to quantify the most significant carbon emission such that the reductions can be addressed in a strategic manner.

The Net Carbon dioxide released during the production of BMCS & BMRC per ton is found to be 1.308 tons and that of steel being 3.8 tons and for Aluminium and plastic is 1.5 tons and 3.0 tons respectively. The

carbon dioxide released during the production of BMCS & BMRC is found to be less compared to the other existing roofing materials.

The energy audits determined that the combined total energy consumption was 22784 MJ for the manufacture of one ton of BMCS, while for Aluminium, Galvanized iron and fibre reinforced plastic corrugated sheets energy consumption is 32,541.7MJ 89,408 MJ and 77,190MJ respectively which are very high compared to BMCS & BMRC while for Asbestos roofing sheet the energy consumption is 430 MJ which is very less compared to all the existing roofing materials. However during the processing of Asbestos roofing sheet the health hazards (carcinogenic) is higher and is being banned in most of the countries.

The study reveals that the total energy requirement for the manufacture of production of Bamboo Mat Corrugated Sheet (BMCS) and Bamboo Mat Ridge cap (BMRC) is very less compared to other conventional roofing materials. The measurement of carbon footprint of BMCS and BMRC from procurement of raw material to finished products indicates that there is net gain of carbon in the process resulting in substantial storing of carbon. The emission of formaldehyde from the manufacturing unit is found to range from 0.03 – 0.05 ppm which complies to E1 emission level of European standards.

#### **Study on the feasibility of the manufacture of medium density Fibre Board from Rice Straw.**

With dwindling wood resources on one hand and increasing demand for the wood based panel products on the other, attention is gaining momentum on the utilization of agro-residues and also recycling of wood waste for manufacture of panel products. Unlike plywood, and Particle Board (PB), Medium Density Fibre Board (MDF) provide

enough scope for the substitution of wood by non-wood fibre resources. .

Forestry regulations, cost effective pulp and paper products, lumber and new wood based bio energy applications will probably result in increased competition for wood based raw materials. Alternative non wood raw materials will therefore be of high priority.

Reported investigation of fibre board production based on rice straw are less frequent and the rice straw materials are often combined with other raw materials are used for the production of thermoplastic composites.

Most of the study on Production of fiberboards has been performed by addition of methylene diphenyl diisocyanate (MDI) resins finished fiberboards based on rice straw and MDI resin showed excellent properties w.r.t MOR & MOE. The results obtained were acceptable according to the requirements of medium-density fiberboard (MDF) for interior applications (American National Standards Institute, ANSI A208.2-2002).

Keeping this in view, IPIRTI carried out research on the development of MDF using rice straw fibres under a project sponsored by M/s Sarda Plywood Industries Ltd., kolkata. In this study suitable adhesive formulations based on phenolics, amino and MDI has been worked out . The adhesive composition and the process parameters have been optimized to achieve the strength properties that are comparable with wood fibre boards.

Since most of the research being carried out on rice straw composites are evaluated with reference to American national standard the present datas were also compared. It was found that all the properties confirm to the requirement of ANSI A 208.2-2002 with phenolic amino resin and MDI resin system. The results obtained were also compared

with IS 12406: Specification for MDF for general purposes. The panels made with 50% replacement of rice straw fibres with wood fibres with all the resin system and 100% rice straw fibres with MDI resin confirms to the requirement of MOR, MOE, thickness swelling, water absorption after 24 hours and screw holding strength properties as per is 12406

This research on the development of MDF from rice straw fibres is to be the first of its kind in the country.

### Life Cycle Assessment of Wood and Bamboo Composite Products

LCA for wood and bamboo composite products for which very less durable raw materials are being used evaluates environmental burdens associated with a product, process or activity by identifying and quantifying energy and materials used and wastes released to the environment: to assess the impact of those energy and material uses and releases to the environment: and to identify and evaluate opportunities to affect environmental improvements. Issues associated with designing, manufacturing, maintaining and disposing of systems while adhering to environmental laws, budgetary constraints and minimizing risks are addressed.

The energy audit and the measurement of carbon foot prints involved in the production of plywood, bamboo mat corrugated sheet (BMCS) and bamboo mat ridge cap (BMRC) was carried out in a commercial unit. The study reveals that the total energy requirement for the production of plywood, bamboo mat corrugated sheet (BMCS) and bamboo mat ridge cap (BMRC) is very less compared to other conventional materials being used. The emission of green house gases and effluent were measured in the production unit and has been found that the emission of gases is well within the tolerance limits prescribed by the pollution control board. The effluents

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collected during the production have indicated negligible level of solids and the toxic chemicals.

### **Establishment of Modern Fire Resistance Door Testing Facility at IPIRTI, Bangalore**

With the increasing building activities and stringent building regulations the behaviour of building components from various panel products or in combination with other materials against fire and to ensure occupants safety is the need of the hour. With the recent regulations relating to buildings in India, there is also a market for fire retardant wooden doors in housing applications. There are huge opportunities for developers and architects to add value to their properties through these fire retardant doors. Occupants of buildings will be the major beneficiaries as it gives them additional peace of mind and protection from fire without compromising the use of green building materials viz. wood and panel products. Keeping future requirements of building bye-laws in our country and to facilitate testing of fire check doors, the facility is being established at IPIRTI for testing fire performance of full size door/shutters as per national/ international standards such as BS 476 (part 20 and 22), IS 3614 (part 2), ISO 3008:2007 and BS EN 1634-1:2000 using latest technologies and instrumentation comparable with best in the world.

Fire doors are "rated" by time (in minutes or hours) that a door can withstand exposure to fire test conditions and the failure criteria is assessed by Integrity & Insulation. Hourly ratings include 2 hours, 1 ½ hours, 1 hour and, ½ hour with the maximum rating required of any swinging type fire door being three hours.

The salient features of the fire door testing setup are:-

- Vertical front open furnace structure with refractory bricks & ceramic wool blanket for best heat insulation
- Computer programmable Automated LPG burners with computer controlled LPG flow
- Hot gas exhaust system with automated dumper system
- Pillar mounted I beam jib crane with electric hoist
- Test frame to hold door under test with trolley and roller skid
- Thermocouple assembly with good measurement accuracy
- PC based multi-channel data logger, etc.
- The system is equipped with fire-fighting and safety equipment's

### **Evaluation of Earthquake Resistant Feature of Bamboo Housing System Using Shock Table**

Recent earthquake devastated Japan causing unprecedented havoc, claiming lives and property on a scale hard to imagine. However, seismologists observe that few died in the Island nation due to building collapses, given that the Japanese have perfected the technology for quakeproof constructions. It was the ensuing tsunami that cost most lives.

India may not be prone to quakes of the same intensity, but we have regions that require quakeproof housing. The Indian Plywood Industries Research and Training Institute (IPIRTI) has developed and tested a bamboo-based house suited to disaster-prone areas.

The Bamboo based House built by the institute based on IPIRTI -TRADA Technology was tested in the institute premises for the efficacy of the structure recently. Shri. Jagadish Vengala, Scientist & Head of the Products Application Division, IPIRTI, Bangalore, tested the Bamboo house by mounting it on a 'shock

table' and delivering a series of base shocks through a simple pendulum device, the impact of which was comparable to earthquakes.

The Bamboo house resisted seven repetitions of a typical Zone 5 earthquake, the highest in India and equivalent to over 7 on the Richter scale, showing no signs of falling apart, in contrast to a concrete structure. There were only a few cracks showing at the end of the most intensive of shocks.

The house has split bamboo grid and wire mesh, plastered with cement mortar for walls with bamboo columns providing support. The ceiling is made of light bamboo mat corrugated sheets developed by IPIRTI, Bangalore.

### Development of Bamboo Particle Board

Due to the increasing shortage of industrial wood and also associated policy changes in recent years, Bamboo is emerging as an important raw material alternative to wood required for panel products. As a result number of panel products have been developed utilizing bamboo. In this study investigations were carried out to manufacture particle boards from bamboo. From the test results of particle board made from bamboo, it is found that the bamboo is suitable for the manufacture of flat pressed three layered Grade-2 (FPT-2) Particle boards and meets the requirements as prescribed in IS 3087(2005) for Grade 2 Medium Density Particle board.

The present research work was planned with a view to examine the efficacy of two newer pesticides viz., Lufenuron and Diflubenzuron against powder post beetle and termite. This is the first report on the use of Lufenuron and Diflubenzuron in the glue line to control the wood borer and termite. Plywood samples were prepared using Phenol Formaldehyde (PF) resin mixed with Lufenuron

and Diflubenzuron at 0.01, 0.5, 1 & 2% concentration and tested for glue shear strength in dry, wet and mycological state as per IS: 1734 part (4) 1983. The results were compared with prescribed values of glue shear strength given in IS 710-1976. It was found that sample conforms the prescribed values of glue shear strength as per IS: 710 (1976). The study was limited to lab scale for testing the efficacy of chemical in glue line and the bond quality / shear strength of the adhesive. From the results it has been found that Lufenuron and Diflubenzuron at 2% rate provided excellent control of *Lyctus africanus* and subterranean termite.

### Training

Training essentially is an integral part of human life. In recent years, Human Resource Planning has assumed great significance in manufacturing sector which includes wood based panel industry.

The training centre in this Institute was established by the Government of India with the assistance of United Nations Development Programme (UNDP) and Food and Agriculture Organisation (FAO) of the United Nations in the year 1988.

From then onwards the Institute is catering to HRD needs of the wood based panel industries through several training programmes. In this endeavour the Institute has excellent infrastructural facilities for classroom teaching, laboratory and factory simulated facilities for "hands on" training in Sawdoctoring, Saw milling, Plywood, Resin and Blockboard Manufacture, and Testing. Apart from lectures by experienced in-house specialists and invited resource persons, audio-video sessions and laboratory practicals, emphasis is given to impart and improve skills through demonstration and floor level working.

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### Post-graduate Diploma Course in Wood and Panel Products Technology

The post graduate diploma course in Wood and Panel Products Technology, the only one of its kind in the country had been widely recognized by the industry and the trainees passed out from the course are in great demand among the panel industry.

PGDC, an one year job oriented training course provides a unique opportunity to basic science and engineering graduates for a career in one of the green industrial processing sectors viz., wood based industry.

During the year, 22<sup>nd</sup> batch for One year Post-graduate Diploma Course in Wood and Panel Products Technology was conducted wherein 20 candidates completed the course successfully and 100% placement was arranged through Campus selection process. The trainees of 22<sup>nd</sup> batch PGD course have been placed in all the leading Plywood and Panel Industries. Twenty third batch PGDC course commenced on October, 2011 with 19 candidates.

### Short Term Training Courses Conducted

- A short term training course on "Resin Manufacturing" was conducted during 04 – 11 April, 2011 at IPIRTI Field Station, Kolkata.
- A short term training course on "Testing of Plywood, Block board and Flush door" was conducted during 11 – 14 April, 2011 at IPIRTI Field Station, Kolkata.
- A short term training course on "Plywood Manufacturing Technology" was conducted during 02 – 30 May, 2011 at IPIRTI Field Station, Kolkata.
- A short term training course on "Plywood Manufacturing-I" (log storage, centering, peeling, clipping, drying, knife grinding)

was conducted during 11 – 15 July, 2011 at IPIRTI, Bangalore.

- A short term training course on "Retention of preservative" was conducted during 18 – 22 July, 2011 at IPIRTI Field Station, Kolkata.
- A short term training course on "Plywood Manufacturing-II" (Adhesives for plywood and plywood manufacturing-resin preparation, gluing, hot pressing) was conducted during 25 – 29 July, 2011 at IPIRTI, Bangalore.
- A short term training course on "Testing of Plywood and Block board as per IS:303, IS:710, IS:1328, IS:4990 and IS:1659 was conducted during 23 – 26 August, 2011 at IPIRTI, Bangalore.
- A short term training course on "Plywood Manufacturing Technology" was conducted during 02 August, 2011 to 07 September, 2011 at IPIRTI Field Station, Kolkata.
- A short term training course on "Testing of fire retardant plywood" was conducted during 21 – 22 September, 2011 at IPIRTI Centre, Mohali.
- A special training course on testing of Structural Plywood was conducted during 01- 04 Nov 2011.
- Training Course on "Veneer & Resin Manufacture" was conducted from 5<sup>th</sup> September, 2011 to 30<sup>th</sup> September, 2011 for 10 candidates sponsored by M/s. Rai Plywood (K) Ltd, Kenya.

### Wildlife Education and Training

#### Wildlife Institute of India (WII)

Wildlife education and training is primarily looked after by Wildlife Institute of India (WII), Dehradun; an autonomous institute of the Ministry for imparting training to government and non-governmental personnel to carry out research and training activities

and advice on matters of conservation and management of wildlife resources. The details of educational and training programmes conducted by the Institute are as follows:

## Academic and Training

### Courses and Training Programmes

- **XII M.Sc. (Wildlife Science) Course, June 2009 to July 2011.** A total of 11 candidates (nine Indians and two foreign nationals) joined the course. Besides, classroom teaching of IV semester, the students completed their field research and dissertation projects in different States of the country during the reporting period. They also submitted their dissertation report to the concerned supervisors. After presentation of dissertation work and *Viva-Voce* during July 27-28, 2011, all the students have successfully completed the course.
- **XIII M.Sc. (Wildlife Science) Course, June 2011 to June 2013.** A national entrance test was conducted in six cities of the country for selection of M.Sc. students on March 27, 2011. A total of 13 candidates (12 Indians and one foreign national) joined the course after Personality and Aptitude Test during May 19-20, 2011. The students were taken for their Orientation-cum-study Tour to Rajaji National Park during July 18-22, 2011. The Techniques Tour was conducted at Panna Tiger Reserve, Madhya Pradesh during October 14-24, 2011.
- **XXXII Advanced Post-Graduate Diploma Course in Wildlife Management, September 1, 2010 to June 30, 2011.** The 10-month P.G. Diploma Course in Advanced Wildlife Management commenced from 1st September, 2010 at this Institute with 20 officer trainees of the rank of Deputy Conservator of Forests/Assistant Conservator of Forests and equivalent levels. During the period, the Management Term Paper Exercise has been completed by the officer trainees. The field work was conducted from March 30 to April 9, 2011 in Dachigam National Park, J&K; Velavadar National Park, Gujarat; Satpuda Tiger Reserve, Madhya Pradesh; Wayanad Wildlife Sanctuary, Kerala; and Nameri Tiger Reserve, Assam. Management Plan Exercise was conducted at Nagarhole Tiger Reserve in Karnataka during May 1-31, 2011. All the 20 officer trainees have successfully completed the Course.
- **XXXIII Post Graduate Diploma in Advanced Wildlife Management, September 1, 2011 to June 30, 2012.** The XXXIII Post Graduate Diploma in Advanced Wildlife Management commenced on September 1, 2011. A total of nine Officer Trainees from different States of the country joined the course. Two IFS Probationers joined directly after completing their training at Indira Gandhi National Forest Academy, Dehradun as 'Hari Singh Fellows'. The orientation tour took place during September 25-30, 2011 at Corbett Tiger Reserve. It familiarized the officer trainees to the Terai-bhabar landscape and issues related to corridor management, people-park interface, relocation and mass tourism.
- **XXVII Certificate Course in Wildlife Management, November 1, 2011 to January 31, 2012.** XXVII Certificate Course in Wildlife Management commenced on November 1, 2011 for three-month duration. A total of 16 participants, 6 Indian and two each from Malaysia, Vietnam and Bhutan, and four from Bangladesh joined the course. All the officer trainees have successfully completed the course.

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- **Training Programme for Wildlife Professionals from Government of Bhutan, May 2-9, 2011.** Twelve Wildlife professionals from Sakteng Wildlife Sanctuary of Nature Conservation Division, Government of Bhutan participated in training programme on Wildlife Management of High Altitude Protected Areas. Course component included biodiversity and conservation issues in Bhutan and Eastern Himalaya, monitoring of wildlife and their habitats, forest vegetation and alpine rangeland monitoring, recent advances in wildlife management in Himalaya, project snow leopard, human wildlife conflicts and evaluation of effectiveness of management in Himalayan Protected Areas were delivered.

- **Special Training Course for Officers of Government of Bangladesh, Dehradun, June 1-25, 2011.** The special training course was organized by Wildlife Institute of India for officers from Bangladesh. It was funded by Integrated Protected Area Co-Management Project (IPAC) of Government of Bangladesh. A total of five participants from Departments of Forest, Environment and Fisheries attended the program.

The first part of the course was conducted at the Institute during which interactive classroom sessions were held on contemporary wildlife issues. The participants were taken for a visit to Forest Research Institute; Forest Survey of India; Indira Gandhi National Forest Academy; and Central Academy for State Forest Service to acquaint them with the activities of the various institutions engaged in training and research. During the second part of the course, the participants visited various protected areas and zoos in Orissa and

West Bengal to link theory with the practice of wildlife management. They visited Nandankanan Zoo, Balukhand Konark Sanctuary, Debi River mouth, Rushikulya Rookery, Chilika Lagoon, Alipore Zoo and Sunderbans Tiger Reserve.

- **Special Training Course for Officers of WWF-Pakistan, Dehradun, June 6-30, 2011.** The course for WWF-Pakistan Officers was conducted at Wildlife Institute of India. A total of seven participants from WWF-Pakistan and Department of Forest & Wildlife attended the program. The basic objective of the course was to provide an exposure on current scenario in wildlife and biodiversity conservation in India and facilitate understanding of various conservation approaches and good wildlife management practices. The first part of the course was conducted at the Institute during which interactive classroom sessions were held on contemporary wildlife issues. The participants were taken for a visit to Forest Research Institute; and Forest Survey of India to acquaint themselves with the activities of these institutions. They were also taken to Asan Conservation Reserve and Rajaji National Park to show the good practices of participative wildlife management, wetland management etc. During the second part of the course, the participants visited various protected areas, zoos and rescue centres in Uttarakhand, Delhi and Rajasthan to link theory with the practice of wildlife management. They also visited Corbett Tiger Reserve, National Zoological Park, Ranthambore Tiger Reserve and Jaipur Zoo & Rescue Centre.

- **National Level Training Programme on “Biodiversity Conservation with a Focus on Ecological Monitoring”, Dehradun, September 5-9, 2011.** The National Level Training Programme for Scientists and Technologists sponsored by Department of Science and Technology was conducted at Wildlife Institute of India. The course had the following objectives: (i) to make fully aware scientists on principles/approaches in Ecological Monitoring; (ii) to make them scientists aware of causes of decline in natural resources/habitats and species; (iii) to make them aware of good practices in Ecological Monitoring; (iv) to establish linkages and facilitate sharing of information among scientists; (v) to reiterate their role in creation of baseline information and database management.

In all 22 participants from 16 different organizations participated in the programme. During the course the participants were exposed to case studies, field monitoring methods and hands-on training in the lab with analytical tools.

- **One Week Compulsory Training Course on “Human-Wildlife Conflict: Issues and Mitigation”, Dehradun, December 12-16, 2011.** This course was conducted at Wildlife Institute of India, Dehra Dun as per the instructions from the Ministry of Environment & Forests, Govt. of India, New Delhi. The course was for the in-service IFS Officers from various States of the country. Overall the programme sensitized the officers about their role in Human Wildlife Conflict. There was a panel discussion on the topic “Improvement in the working of Forest Departments – Need for career development through training and

improvement of skills”. The idea for such panel discussions was to have suggestions for up-gradation of skills of foresters, adoption of modern techniques and their applications in forestry activities and advancement of individual careers with the ultimate aim of improving the working of the State Forest Department for efficient service delivery to the people. A total of 23 participants attended this course.

- **One Week Compulsory Training Course on “Wildlife Offences: Role of Intelligence Gathering and Wildlife Forensics” for the IFS officers, Dehradun, January 16-20, 2012.** The course conducted at the Institute was sponsored by the Ministry of Environment and Forests, Government of India. This course was designed to give an overview of wildlife offences situation in the country and existing mechanism and strategies to deal with the problem. There were 20 IFS Officers from 11 States participated in the course. During the training programme, sessions were planned to discuss the wildlife Crime scenario, understand and interpret Wildlife Protection Act, Custom Act, CITES and Cr. P.C. Role of agencies like Wildlife Crime Control Bureau, Customs, ITBP, BSF and Army involved in dealing with illegal trade in wildlife articles and need for intelligence gathering by the Forest Department and local police administration was discussed.

The Wildlife crime Control Bureau, New Delhi provided special inputs for this programme. Field visit to Rajaji National Park was organized to understand the Protection Strategies: Intelligence Gathering, Anti-Poaching Strategies and Role of Wildlife Forensics in Dealing with Wildlife Crime in the Park. The participants could perceive the

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complexity of Wildlife Crime and the Role of Forensic Evidence for proper Enforcement. They interacted with Park Manager to understand the key factors threatening the rich Biodiversity of the Park and what form of innovative strategies are required to combat wildlife crime.

- **Attachment of Probationers of Indian Revenue Service (Customs & Central Excise) Group - A 62<sup>nd</sup> Batch with Wildlife Institute of India, Dehradun, January 16-27, 2012 and January 30 - February 10, 2012.** The training module basically aimed at sensitizing the young officers of Indian Revenue Service (Customs & Central Excise) towards wildlife trade in the country and their role in checking it. The course was attended by a large group of 167 officers attended in two groups having varying educational background. Various inputs including introduction on importance of biodiversity and its conservation, status of endangered species including flagship species like tiger and its monitoring, special inputs on illegal trade in wildlife articles including butterflies, *shahtoosh*, rhino horn, skins, and tiger bones. Inputs were also given on importance of plant taxonomy and trade in medicinal plants.
- Special inputs were given on the role of Wildlife Forensic in dealing with wildlife cases. Officers were also given basic information on the implementation of Wildlife Protection Act, 1972, CITES and TRAFFIC. Apart from providing indoor inputs, the officers were also taken in protected areas like Corbett National Park where they had interaction with forest officers. Jungle safaris in the Dhikala and Bijrani area of Corbett National Park have sensitized them not

only towards flagship species but also some other lesser known keystone species.

### Meetings, Workshops, Seminars and Other Activities

- **Second Himalayan Day celebrated, Dehradun, September 9, 2011.** The Institute conducted a Consultation Meeting on 2<sup>nd</sup> Himalayan Day. The faculty members, researchers and M.Sc. students discussed the contribution of Wildlife Institute of India in establishing knowledge base specifically on the biodiversity richness, conservation issues and wildlife management related aspects of the Himalayan Landscape. The deliberations focused to work out strategies for sustaining Himalayan ecosystem as well as on aspects of better outreach of science based information to authorities in particular and the civil society in general to facilitate environment friendly decisions enabling conservation of bio-resources without compromising the ecosystem services of Himalayan landscape. It was also decided to publish popular articles pertaining to research in Himalayan region in the coming issues of WII Newsletter.
- **VII-Internal Annual Research Seminar (IARS), October 10, 2011.** During the IARS, a total of 15 presentations were made in four technical sessions *viz.* Vegetation Ecology and Population Estimation; Captive Management and Conservation Breeding; Development and Conservation Interface and Habitat and Species Assessment. The presentations were based on recently initiated and ongoing research studies and were made by research fellows of the Institute. The presentations were evaluated by a panel of judges and five of them were adjudged

as the 'best presentations' and the concerned research personnel were awarded book prizes each worth Rs. 1500/-.

- **XXV Annual Research Seminar (ARS) of WII, Dehradun, October 11-12, 2011.** The XXV Annual Research Seminar of the Institute was chaired by Prof. R. Sukumar, Chairman, Training, Research and Academic Council (TRAC). A total of 19 presentations were made in five technical sessions. The presentations were based on the ongoing research studies of the Institute.

About 225 delegates/participants attended the ARS that included the Principal Chief Conservators of Forests, Chief Wildlife Wardens and other senior officials representing State Forest Departments, delegates representing NGOs, scientists, conservationists, wildlife experts, faculty members, researchers, M.Sc. students and the officer trainees of the Post Graduate Diploma Course at WII. A panel including eminent scientists, academicians, conservationists and wildlife managers adjudged the 'best five presentations' made during the XXIV Annual Research Seminar of the Institute. All five researchers were given book awards, each worth Rs.1500/-. A photography competition was also held during the ARS and the winners were awarded with book prizes.

- **Celebration of World Environment Day, June 5, 2011.** As part of nationwide celebrations on the occasion of World Environment Day under the aegis of Ministry of Environment & Forests, Govt. of India, the Institute organized following two programmes:
- **Awareness program at Mana, June 1, 2011.** Wildlife Institute of India organized an awareness program in

collaboration with the 127 Infantry Division, Ecological, Indian Army at Mana, the last Indian village bordering China. This was a unique celebration organized in biting cold and drizzle, which of course could succeed in stalling landing of the helicopter bringing Chief Ministers of Uttarakhand and Madhya Pradesh but did not succeed in dampening the spirit of the 400 people gathered there. The Chief Minister of Uttarakhand, who could not travel to Mana due inclement weather, addressed the gathering via mobile telephone. The 10 million and 1 plant of Bhoj Patra, which once was abundant in the area, was planted by the local MLA. Director, WII also planted a sapling of local species. The ladies and the children of Mana village participated in a drawing competition. A puppet show titled "Ped na Kato" (Do not cut trees) was organized for the jawans and their families. An exhibition on 'Biodiversity of Uttarakhand' was also put up as part of the celebration. The celebration at Mana brought all the stakeholders on one platform – the people, government agencies and the policy makers. Forging of such partnerships augurs well for our efforts towards a greener and cleaner environment.

- **Workshop on 'Emerging Issues in Wildlife Conservation', Dehradun, June 5, 2011.** The workshop was conducted at the Institute campus. Padma Vibhushan Shri Sunderlal Bahuguna Ji, Leader of Chipko Movement, was the Chief Guest on this occasion. Ms. Susanne Bech, Associate Programme Officer, UNEP, Nairobi also attended the workshop and briefed the participants about the UNEP's programmes. A total of 60 participants, of which 27 (representing 15 NGOs and civil societies of Uttarakhand), WII faculty

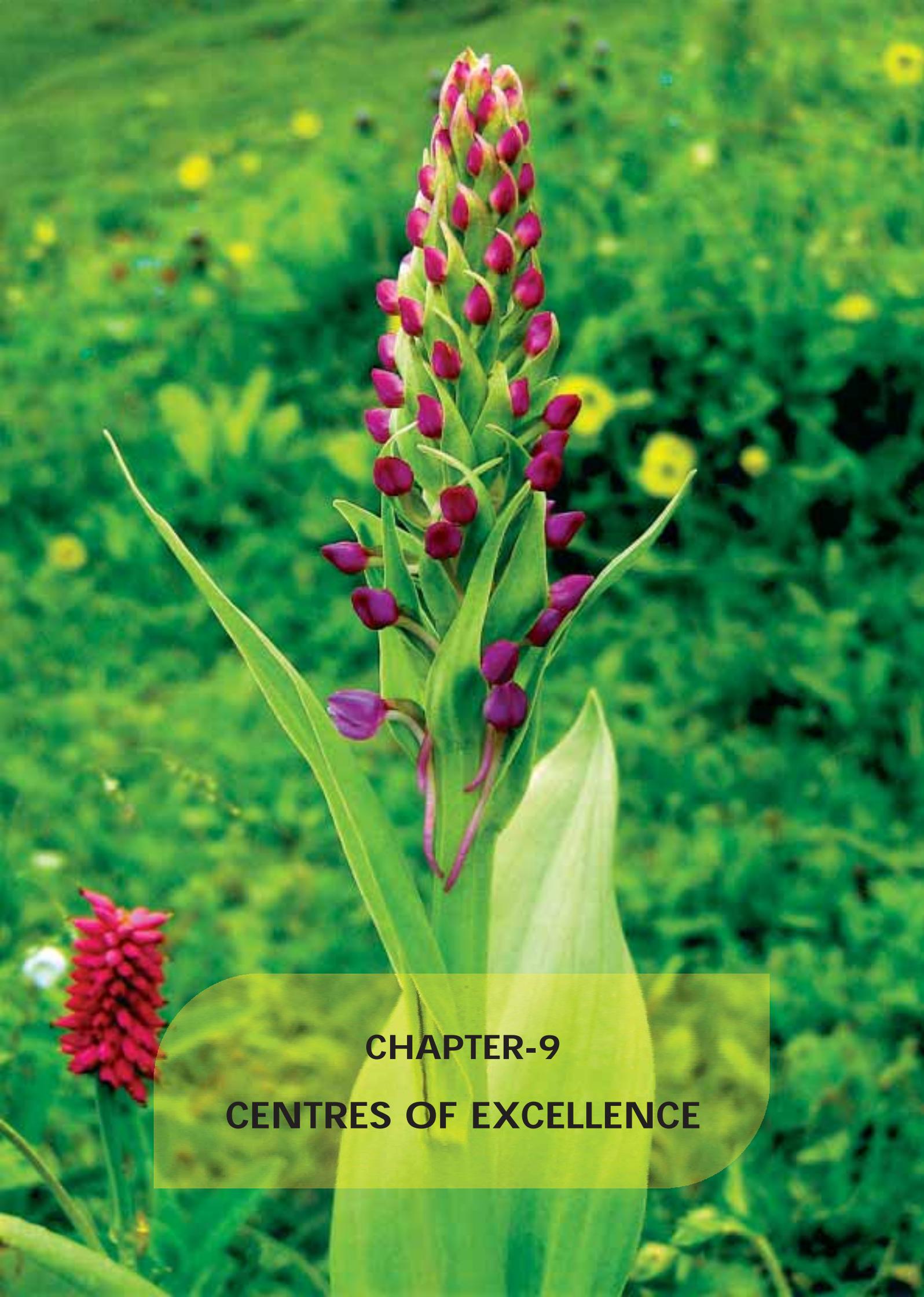
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members, students, researchers and officer trainees attended the workshop. The objectives of the workshop were: (i) to provide a comprehensive understanding of Biodiversity Conservation issues in India; (ii) building capacity for effective and sustained participation of Civil Society Organisations/ NGOs in biodiversity conservation; and (iii) to have a platform to examine how civil society can contribute to biodiversity conservation. The workshop has been able to identify areas of cooperation between the Civil Society Groups and the Forest Department for future action. The detailed outcome of the workshop is under finalization for wider dissemination.

- **Workshop on 'Implementation of Rajbhasha', Dehradun, September 14, 2011.** A workshop on implementation of Rajbhasha was organized at the Institute on the Hindi Diwas. The aim of the workshop was to discuss about maximizing the use of Rajbhasha in the Institute and informing the staff about the policies & rules of the Rajbhasha. The officers and the staff of

the Institute participated in the workshop. Group discussions were held for discussing the problems in use of the Rajbhasha.

- **Wildlife Week celebrated, Dehradun, October 2-8, 2011.** The Wildlife Week was celebrated at the Institute during October 2-8, 2011. The main aim of the Wildlife Week was to make the younger generation aware about the importance of wildlife for the entire world. The following activities were organized by the Institute during the Wildlife Week: (i) An Environment & Wildlife Quiz was organized by the Institute in collaboration with the Friends of Doon, Dehradun for the school children of Dehradun, and (ii) A State level quiz competition was organized for the students of different districts of Uttarakhand as part of the Corbett Platinum Jubilee celebrations. It was conducted by the Institute in collaboration with the Forest Department of Uttarakhand. The winners were awarded during the Corbett Platinum Jubilee celebration.



**CHAPTER-9**

**CENTRES OF EXCELLENCE**

## Centres of Excellence

Enhancement of people's awareness about environment requires capacity building at institutional and individual level for providing adequate support to the efforts in the fields of environment education, research and training. To serve this end, the Ministry launched the scheme 'Centres of Excellence' in 1983 to promote institutions in priority areas of Environmental Sciences and Management.

Ten Centres of Excellence have so far been established in different areas:

- (i) Centre for Environment Education (CEE), Ahmedabad
- (ii) CPR Environmental Education Centre (CPREEC), Chennai
- (iii) Centre for Ecological Sciences (CES), Indian Institute of Science (IISc), Bengaluru
- (iv) Centre of Mining Environment (CME), Indian School of Mines, Dhanbad
- (v) Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore
- (vi) Centre for Environment Management of Degraded Ecosystem (CEMDE), University of Delhi, Delhi
- (vii) Madras School of Economics (MSE), Chennai
- (viii) Foundation for Revitalization of Local Health Traditions (FRLHT), Bengaluru
- (ix) The Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram
- (x) Centre for Animals and Environment, CARTMAN, Bengaluru.

### Centre for Environment Education (CEE), Ahmedabad

Centre for Environment Education (CEE) was established in 1984 as a Centre of Excellence in Environmental Education, supported by the Ministry of Environment and Forests (MOEF), Government of India, in recognition of the importance of

environmental education in India's overall environment and development strategy. CEE is a national institution engaged in developing programmes and material to increase awareness and concern, leading to action, regarding the environment and sustainable development. It has inherited the rich multidisciplinary resource base and varied experience of Nehru Foundation for Development (NFD), its parent organization, which has been promoting educational efforts since 1966 in the areas of science, nature study, health, development and environment.

### Paryavaran Mitra Programme

"Paryavaran Mitra", one of the largest sustainability and climate change education programmes in the world, was launched in CEE, on 24 July 2010. The Paryavaran Mitra Programme is an initiative of CEE in partnership with the Ministry of Environment and Forests (MOEF) and is supported by Arcelor Mittal.

Paryavaran Mitra is a programme for students that envisions 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 have the knowledge, awareness and commitment to meet the challenges of global citizenship and climate change. The



Fig.66. Environment Education Orientation Session

Paryavaran Mitra programme aims to guide, facilitate, capacity build students through curriculum-linked activities and co-curricular action projects to take positive environmental action at individual, community, national and global level.

The first phase of the programme is for a period of three years from 2010-2013 during which the aim is to reach students in classes from standards six - nine (age group 11-15 years). Two lakh schools and two crore school students across the country are to be reached in this phase.

So far, 1,56,000 schools have been enrolled and more than 1,20,000 students have received the first set of material translated into 13 Indian languages. The programme has a total of 160 partnerships including Pollution Control Boards in most states, grassroots NGOs, school networks like the Jawahar Navodaya Vidyalaya, and Army Public Schools. Master Trainers, teachers and others have been directly or indirectly oriented about the programme. Of the total schools enrolled, more than 7533 schools have carried out action projects in the five Paryavaran Mitra themes, i.e. Water and Sanitation, Biodiversity and Greening, Culture and Heritage, Energy, and Waste Management. A Paryavaran Mitra Lead School will mentor schools in their immediate surroundings to encourage, guide, and facilitate them in the process of becoming Paryavaran Mitra schools. A Lead school is a school that shows leadership in actions for sustainability. It is a school that not only demonstrates best practices, but also helps other schools in developing a vision and an action plan for becoming Paryavaran Mitra School.

Paryavaran Mitra represents Hand print action. Hand print is a measure of Education for Sustainable Development (ESD) action; action that is directed to decrease the human footprint and make the world more sustainable.

## National Green Corps (NGC)

CEE implements NGC programme in 15 states and two Union Territories as resource agency.

There were regular meetings with Nodal Agencies for planning and strengthening the NGC programme. This helped in planning annual activities of the NGC. Around 2 state and 10 district level training programmes were facilitated, and around 15 events for NGC schools on various environmentally significant days were organized. Around 1 - 2 % schools were visited for monitoring and outreach events at various levels were organized. Four to five prototypes of resource material which included manuals, posters, stickers, pamphlets, etc were also developed.

## Biodiversity Conservation

### Ganges River Dolphin Conservation Education

CEE with support from the Ministry of Environment and Forests (MoEF) has initiated a two-year project on Ganges River Dolphin Conservation Education Programme in the north and 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. An educational package for various target groups has been developed in four languages - English, Hindi, Bengali and Assamese. The brochure and posters have reached all 20 clusters with more than 475 schools on board for the project. Two national level workshops and 16 Teacher Training workshops were organized. A national river dolphin camp was organized for schools at Vikramshila Gangetic Dolphin Sanctuary. During the Magh Mela in Allahabad, a three-day event was organized to involve religious groups in spreading the conservation messages.

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## Science Express

'Science Express' is a unique, state-of-the-art exhibition train that has done four runs across the country, bringing science awareness to the doorsteps of millions of children, youth and other citizens. In its next phase, starting April 2012, this train will become the *Biodiversity Special* and carry special exhibits on biodiversity of India. It will reach Hyderabad/Secunderabad in September/October 2012 to coincide with the 11<sup>th</sup> Conference of Parties to the Convention on Biodiversity (CBD COP11) being held there.

In partnership with the MoEF Department of Science & Technology, CEE is specially designing eight coaches for this purpose. Through visuals, models, audio-video and interactive exhibits, it is planned to portray India's unique biodiversity in national and eco-regional thematic modes, its relationship with mankind, its place in our diverse and ancient cultures, its importance, status, threats, conservation needs, action being taken by government and other agencies, along with some success stories. The entire exhibition will be targeted at non-specialists and common citizens, especially school college students, teachers and families.

## ENVIS

Four issues of the newsletter Education for Change were brought out as part of the activities of the ENVIS Centre on Environmental Education of which Vol 17.1 and 2 were electronic versions. The website "Green Teacher" was regularly updated and new content added every month, including EE activities, book reviews, articles on EE, information on events and environment days.

## National Environment Awareness Campaign

National Environment Awareness Campaign (NEAC), a national programme of the MoEF aims to create environmental awareness across the country and inspire

citizens to participate in the protection of the environment.

'Forests for Sustainable Livelihood', the theme for the 2011-12 NEAC programme, is aimed at sensitising citizens about the importance of forest conservation. Some of the components under this theme include protection to sacred groves, promotion of bio-farming, promotion of the use of eco friendly and organic products, revival of traditional herbal remedies, promotion of alternate energy sources, to name a few. The theme is important considering the United Nations General Assembly declared 2011 as the International Year of Forests to raise awareness on sustainable management, conservation and sustainable development of all types of forests.

As part of NEAC, participating agencies which included NGOs, schools and colleges, community organizations and government institutions from across the country submitted proposals to promote awareness and initiate action for the conservation of forests. Awareness activities proposed included workshops, rallies, exhibitions, street plays and *padyatras*. Some other proposals were plantation drives, demonstrations of bio-farming, creation of biodiversity registers, plantation of indigenous species and creation of seed banks to name a few.

For NEAC 2011-12, CEE was associated with the campaign in the capacity of a Centre of Excellence. CEE representatives worked with 21 Regional Resource Agencies (RRAs) located across the country and helped scrutinize about 9000 proposals received by the RRAs. The shortlisted proposals were recommended to the regional committees. This initial round of proposal scrutiny was followed up by the four regional committee meetings. In the capacity of a member in these regional committees, CEE representatives helped in the final shortlisting of proposals for the sanctioning process.

## Conferences

### Asia- Pacific UNEP TUNZA Children and Youth Conference 2012

CEE in partnership with UNEP TUNZA and Ministry of Environment & Forests (MoEF), Government of India organized a three-day conference from 6<sup>th</sup> to 8<sup>th</sup> February, 2012 in Ahmadabad, India. UNEP TUNZA International Youth Conference, held every two years, bring together children and youth from all over the world, giving them the opportunity to share and learn from one another and strengthen their environmental commitments. The Asia Pacific UNEP TUNZA Conference will have a regional focus on environmental action by children and youth of the region.

Children and youth from Asia-Pacific region will gather together to share their concerns on issues of sustainable lifestyles and responsibility towards the planet. The Conference will help in bringing in the perspective of the young to the discussions and outcomes of two significant international events: the Rio+20 or the United Nations Conference on Sustainable Development (UNCSD) to be held in Brazil and the Conference of Parties on Convention of Biological Diversity (CBD COP 11) in India, both being organized in 2012. Children and youth will work together to develop a charter of recommendations to be presented in these conferences. The delegates for the 'Children's Conference' will include 105 Indian participants who will be selected from the National Green Corps (NGC) school network and 100 international participants (120 children and 85 teachers/parents/guardians). The 'Youth Conference' will have 100 youth participants from the SAYEN and other youth networks.

### Journal of Education for Sustainable Development

Two issues of the peer-reviewed

international journal, Journal of Education for Sustainable Development (JESD) were brought out in March and September, 2011. The Journal is a forum for academics and practitioners to share and critique innovations in thinking and practice in the emerging field of Education for Sustainable Development (ESD). The journal is formatted in sections of news, opinion, project descriptions, research, academic opportunities and reviews. Research articles develop, test, or advance ESD theory, research or practice. Project descriptions focus on innovative ESD projects and programmes. A special section addresses international news and events related to the UN Decade of Education for Sustainable Development (2005-2014). The journal publishes reviews of books, videos/films, curricula, and other print and non print ESD materials and programmes. Notes and comments from readers continue the discussion.

### C.P.R. Environmental Education Centre (CPREEC)

#### Introduction

To create awareness among various stakeholders about current environmental issues and our responsibilities towards the preservation of our environment. The programmes are conducted in the states of Andhra Pradesh, Goa, Karnataka, Kerala, Odisha, Maharashtra and Tamil Nadu and the Union Territories of Andaman and Nicobar Islands and Puducherry.

#### Progress /achievements made during the year

#### Green Schools of India

C.P.R. Environmental Education Centre (CPREEC)'s Green Schools of India (GSI) was launched in 2007 in Chennai, Bengaluru, Hyderabad, Ooty, Mysore and Puducherry. More schools have been included this year. This scheme involves students from schools in five areas of environmental management: reducing energy and water consumption,

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waste management, greening the campus and animal welfare.

This programme has been developed in converting environmental awareness education into action. NGC schools also participated in the GSI campaign. Several schools have introduced the concept of GSI and has led to reduction in water and energy consumption and establishment of composting pits for effective solid waste management. Some schools have set up herbal gardens in their school campus and are maintaining them. Annual Green School Award was given to the best performing schools.

### Environmental Education for Teachers

Teachers selected by the state Departments of Education in the states of Andhra Pradesh, Karnataka, Kerala, Goa, Orissa, Maharashtra and Tamil Nadu are trained to teach environmental concepts. Updated resource materials were distributed.

### Kompassionate Kids

Kompassionate Kids - a project funded by the Winsome Constance Kindness Trust, Australia, and the C.P. Ramaswami Aiyar Foundation to extend the scope of environmental education; taught children about the link between their food and environmental damage as well as the importance of kindness to animals. Workshops for teachers and orientation programmes for students were organized in existing and additional schools in Tamil Nadu and Puducherry. Mobile panels on the importance of animal welfare were displayed in the schools. Competitions were organized for the participating school children. All the participating schools have formed Kindness Clubs.

### Biodiversity Conservation Education

Workshops on biodiversity conservation education were conducted for teachers, students, women, villagers in the states of Andhra Pradesh, Karnataka and Tamil Nadu. The focus was on tropical forests, degraded

eco systems and wetlands. The participants were taken on field visits to reserve forests. Teachers and students were trained in the preparation of biodiversity register.

### Sacred Groves

CPREEC has been conserving and restoring sacred groves since 1993-94. Tree plantation and maintenance have been going on in the existing eight sites in the states of Karnataka and Tamil Nadu. Orientation programmes for school students were organized at the sacred grove sites to motivate them towards sacred grove conservation. Saplings were distributed to school students.

### Women and the Environment

CPREEC trained women of villages in waste management, vermicomposting, organic farming, health and nutrition. Saplings and seeds were distributed to the participants and seed banks of local varieties were established by the women self help groups. CPREEC also surveyed the growth rate of saplings and seeds distributed to them in the previous year. On an average 75% survived.

### Nilgiri Biosphere Reserve Conservation Education

The importance of the Nilgiris Biosphere Reserve was conveyed to the teachers, teacher trainees, villagers, women and students in the districts of Nilgiris, Coimbatore, Thiruppur and Erode in Tamil Nadu, Wayanad in Kerala, Mysore and Chamraja Nagar districts in Karnataka. The annual Anti Plastic Campaign of CPREEC was organized at the Botanical Garden in Doty in the Nilgiris. Ozone day celebrations and wildlife week celebrations were also organized.

### Andaman & Nicobar Islands Conservation Education

Teachers, teacher trainees, students and women were chosen for programmes on the importance of the island ecosystem. Exhibition on Forests of India was put up for the benefit of the islanders. The Education Department,

Andaman Administration had identified CPREEC to organize orientation programmes for the in-service teachers throughout the Island.

### **Exhibition**

An exhibition on 'Forests of India' was designed and put up at Chennai. The same exhibition was put up Science Festival organized by Government of Tamil Nadu and at Central Agricultural Research Institute (CART), Port Blair in Andaman & Nicobar Islands. A pamphlet on Forests of India was distributed free to all visitors. Inter quiz competition was conducted to assess the student's comprehension.

### **Econews**

Four issues of the quarterly newsletter *ECONEWS* were brought out.

### **Indian Journal of Environmental Education**

This is a peer-reviewed journal published annually.

### **Publications**

CPREEC's publications are regularly updated and reprinted. This year, a new book on Climate Change and a booklet on Forests of India in English, Tamil and Telugu were brought out.

Earlier booklets on Climate Change (English, Tamil and Telugu), 'Nilgiris Biosphere Reserve' in English, 'Biodiversity' in English and 'Air Pollution - a poster' in Tamil were re-published.

Appropriate resource materials produced by CPREEC were distributed to the participants of the various training programmes organised in the states of Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu and the Union Territories of Andaman & Nicobar Islands and Puducherry.

### **Research and Surveys**

CPREEC carried out ambient air quality, water level and noise level surveys at various

locations in Chennai city in Tamil Nadu and ambient air quality survey in Vijayawada in Andhra Pradesh. CPREEC also carried out sea water intrusion surveys at Chennai, Puducherry and East Coast around Pallikaranai marsh. In addition to the above, CPREEC also analyzed lake water samples, water samples from temple tanks, mineral water samples and packaged water samples in Chennai city and also water samples collected from various river basins of Tamil Nadu. The samples were analyzed for chemical and microbial parameters.

### **ENVIS Centre**

CPREEC's ENVIS Centre on Conservation of Ecological Heritage and Sacred Sites of India has expanded the existing database on various aspects of Indian ecological heritage with primary and secondary sources. The Bi-Annual ENVIS newsletter *ECOHERITAGE.COM* was published in the prescribed format. A seminar on Ecological Traditions of Madhya Pradesh was held in Bhopal.

### **National Green Corps (NGC)**

CPREEC is the Resource Agency (RA) for NGC in the states of Andhra Pradesh, Karnataka, Kerala, Goa, Odisha, Tamil Nadu and Union Territories of Andaman & Nicobar Islands and Puducherry. Workshops were organised for selected district NGC teacher-coordinators in the states of Andhra Pradesh, Karnataka, Odisha, Tamil Nadu and Union Territory of Puducherry. NGC schools participated in the GSI campaign. Resource materials were provided to all the Nodal Agencies.

### **Biomedical Waste Management**

CPREEC conducted workshops on Biomedical Waste Management for Medical Officers at Bhubaneswar in Odisha, Chengalpatu and Trichy in Tamil Nadu. The workshops were organized in collaboration with the State Pollution Control Board and the Indian Medical Association.

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### **International Biodiversity Day Celebrations**

CPREEC's state office at Andhra Pradesh organized a programme for villagers of Medak District while CPREEC's Field Office at Ooty organized a programme for women in Nilgiris. The Field Office at Port Blair in the Andaman & Nicobar Islands organized a Lecture on Island Ecology with special reference to Biodiversity Conservation. To mark the day, saplings were planted at the Botanical Survey of India (BSI) gai'den and a signature campaign.

### **World Environment Day Celebrations**

CPREEC organized a Nature Camp, funded by Ministry of Environment and Forests, Government of India at the Mudumalai Tiger Reserve in the Nilgiris for selected students from schools from June 3-5, 2011.

Mr. Deepak Srivastava, IFS., Director, Hill Area Development Project (HADP), Ooty, inaugurated the Nature Camp.

### **C. P. R. Environmental Education Centre's Award for Environmental Education**

Dr. M.S. Swaminathan, Chairman, CPREEC, gave away the annual C. P. R. Environmental Education Centre Award for Environmental Education - 2011 to Mr. B.V. Gundappa, Assistant Master, Government Pre-university College, Nagavalli, Tumkur Taluk, Tumkur District, Karnataka, in recognition of his contribution to the use of environmental education and awareness among the students and the local community of Nagavalli in Tumkur district to protect wildlife and water resources.

### **GLOBE Programmes**

CPREEC in collaboration with the US Consulate General, Chennai organised the GLOBE workshop for teachers at Coimbatore in Tamil Nadu and at Mysore in Karnataka. GLOBE kits were distributed to all the participating 38 schools, 20 existing GLOBE

schools in Chennai city. The GPS readings of the schools in Coimbatore and Mysore have been recorded and communicated to the GLOBE Country Coordinator.

### **National Environmental Awareness Campaign (NEAC)**

CPREEC was assigned to organize the National Level Interactive workshop of Regional Resource Agencies (RRAs) for effective implementation of NEAC - 2011-12 at New Delhi on August 30, 2011. CPREEC developed a pamphlet on Forests for Sustainable Livelihood and was distributed to all the participating RRAs.

A pamphlet on Forests of India was distributed to NGOs and educational institutions implementing NEAC in northern districts of Tamil Nadu, Andaman & Nicobar Islands and Puducherry.

### **Organizing programmes for Public Works Department, Government of Tamil Nadu**

On behalf of Public Works Department (PWD)/Water Resources Division (WRD), Government of Tamil Nadu, CPREEC organized orientation programmes for school students in the river basins of Tamil Nadu under IAMWARM Project.

### **TRIFED Programmes**

Tribal Cooperative Marketing Development Federation of India Limited (TRIFED), Government of India, sanctioned a Project for the Primary Level Training (PLT) Programme on Kurumba Tribal Painting for the Kurumba tribals at Kengarai Panchayat, Kotagiri Taluk, Nilgiris District, in Tamil Nadu, covering freehand drawing and painting techniques.

### **Centre for Ecological Sciences (CES), Indian Institute of Science (IISc), Bengaluru**

#### **Brief Objective**

The Centre for Ecological Sciences (CES),

Indian Institute of Science (IISc), Bengaluru is conducting research, education, extension & training for field managers in the broad area of ecology with special emphasis on the Western Ghats with practical application in conservation and sustainable development of natural areas of Western Ghats.

### Activities undertaken so far

The Centre has continued to do cutting-edge research in diverse areas of ecology and evolutionary biology that range from the social behaviour of single-celled organisms such as slime moulds to the largest land mammals, the Asian elephant, and from the chemistry to the molecular ecology of species interactions, besides questions concerning planetary issues such as climate change and published 47 refereed papers in reputed international and national journals, a book on Asian Elephants and seven popular articles in addition to three chapters in books and five book reviews. The Centre organized International and National level conferences and symposia like the Students Conference on Conservation Science and the unique meeting for young ecologists of the country called the 'Young Ecologists Talk and Interact' (YETI). Seventeen scientists from abroad and different parts of India visited the centre and interacted with the faculty members and students.

### Progress / achievements during the year

#### Ecology of Invasive Plants

*Lantana camara*, a shrub of Central and South American origin, has become invasive across dry forests worldwide. The effect of the thicket-forming habit of *L. camara* as a dispersal and recruitment barrier in a community of native woody seedlings was examined in a 50-ha permanent plot located in the seasonally dry forest of Mudumalai, southern India. Sixty 100-m<sup>2</sup> plots were enumerated for native woody seedlings between 10-100 cm in height. Of these, 30 plots had no *L. camara* thickets, while the

other 30 had dense thickets. The frequency of occurrence and abundance of seedlings were modeled as a function of dispersal mode (mammal, bird or mechanical) and affinities to forest habitats (dry forest, moist forest or ubiquitous) as well as presence or absence of dense *L. camara* thickets. Furthermore, frequency of occurrence and abundance of individual species were also compared between thickets and no *L. camara*. At the community level, *L. camara* density, dispersal mode and forest habitat affinities of species determined both frequency of occurrence and abundance of seedlings, with the abundance of dry-forest mammal-dispersed species and ubiquitous mechanically dispersed species being significantly lower under *L. camara* thickets. *Phyllanthus emblica* and *Kydia calycina* were found to be significantly less abundant under *L. camara*, whereas most other species were not affected by the presence of thickets. It was inferred that, by affecting the establishment of native tree seedlings, *L. camara* thickets could eventually alter the community composition of such forests.

#### Acoustic biodiversity monitoring

The Centre is developing acoustic sampling as a tool to identify and monitor species in tropical evergreen forests, with an emphasis on crickets, birds and bats. One of the aims is to compare the efficacy of listener-based psychoacoustic sampling with instrument-based recordings of the same. Recently, a new acoustic entropy-based diversity index has been proposed based on ambient noise recordings but this has not been validated against measurements of species diversity using more standard methods. In the past year, the study was carried out in Kodagu district of Karnataka, which has a lot of evergreen forest cover. Instrument recordings of the dawn chorus were carried out simultaneously with listener-based point counts. The acoustic diversity index was found to be problematical when compared with psychoacoustic sampling. The Centre is

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currently evaluating an alternative song recognition software, Songscope, which uses a pattern recognition algorithm, for its efficacy in acoustic species identification.

### Chemical Ecology

The Centre investigated day-night differences in fruit odours in two species of figs, *Ficus racemosa* and *Ficus benghalensis*. The volatile bouquet of fruit of *F. racemosa* that are largely dispersed by bats and other mammals was dominated by fatty acid derivatives such as esters. In this species in which the ripe fig phase is very short, and where the figs drop off soon after ripening, there were no differences between day and night in fruit volatile signature. The volatile bouquet of fruit of *F. benghalensis* that has a long ripening period, however, and that remain attached to the tree for extended periods when ripe, showed an increase in fatty acid derivatives such as esters and of benzenoids such as benzaldehyde at night when they are dispersed by bats, and an elevation of sesquiterpenes during the day when they are dispersed by birds. The Centre has the data to suggest that the volatile signal produced by fruit can show diel differences based on the activity period of the dispersal agent.

**Budget Allocation of the Scheme during the year and progress of Expenditure:** Rs.125 lakhs

### Implementing Organizations along with details of responsibilities

The Centre for Ecological Sciences is functioning under the Administrative control of Indian Institute of Science, Bangalore. The Centre maintains field stations near Mudumalai Wildlife Sanctuary, and in Uttara and Dakshin Kannada districts (Karnataka) in the Western Ghats to facilitate field research in areas which include community and habitat ecology, molecular genetics and conservation biology, large mammal and forest ecology and climate change. The projects range from theoretical

to laboratory to field-based research with the different approaches being used in a complementary manner.

### Centre for Mining Environment (CME), Indian School of Mines, Dhanbad

Centre for Mining Environment (CME) was inducted as a Centre of Excellence in 1987 on a project mode. The Centre is supported by the Ministry of Human Resource Development for its staff and revenue expenditure for running the Centre. The Centre has been mainly engaged in R&D activities and the associated research publications, and in training personnel in mining sector and involved in issues of academic interest pertaining to mining and environment.

### Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore

#### Brief Objectives

The Salim Ali Centre for Ornithology and Natural History (SACON) was established in 1990 as a fully funded centre of excellence under the Ministry with objectives of research in Ornithology covering all aspects of biodiversity and Natural History, develop and conduct regular courses in ornithology and natural history, create a data bank on Indian ornithology and natural history, and disseminate knowledge relating to ornithology and natural history for the benefit of the community.

#### Progress / Achievements made during the year

- SACON's research projects largely involve studies on ecological community / habitats, ecosystems, environmental contamination, environmental assessment, consultancies, conservation actions and nature / conservation education programs. Studies have also been conducted related to community

conservation. As per SACON's objective, most of our studies are related to bird species, their habitats and associated species. However, studies have also been undertaken on other species like lion-tailed macaques, fishing cats and reptiles, as these studies were expected to generate valuable information towards habitat conservation and understanding of the ecological specificities.

- Among the species specific studies on birds the one on spot billed pelican in Andhra Pradesh, and Edible nest swiftlets in Andaman & Nicobar Islands have been progressing with excellent outcomes. Studies on the Spot-billed Pelican, a globally near threatened species, important recommendations are submitted for their conservation actions in the state. SACON's in-situ conservation program, for the Edible nest Swiftlet in its third phase, has resulted in almost 75% population increase in the protected caves. The species has also started breeding in ex-situ Swiftlet houses made especially for the purpose.
- Studies on the ecology of free-ranging Indian Rock Python is first of its kind in the country and has revealed several ecological facts about the species which were not earlier authenticated. Valuable management recommendations have also come up from the study. India is home to 15 species of cats, except the four big cats the small ones do not feature in any major research or conservation planning in the country. The distribution of the smaller ones especially the fishing cat in India is unclear. This study was undertaken to address the above facts and has identified several pockets where this species is distributed and suggested required conservation actions. The phylogenetic relationships among different populations are also being worked out.
- A new population of lion-tailed macaque was discovered at Sirsi-Honnava,

Karnataka and it was thought necessary to indentify the threats faced by the species and the conservation actions required there. The study pointed NTFP collection to be one of the major conflicts the species has with the people living in the area. Recommendations were given for developing an appropriate harvesting strategy so that these food items of macaques are available to them at an optimum level. Karnataka Forest Department considered this recommendation and incorporated them in their current management plan for the area. A study of large mammals in Bannerghatta National Park, Karnataka was taken up on the request from the Karnataka Forest Department which provided inputs for preparation of conservation action plan for the Park.

- The tsunami on the fateful December 26, 2004 destroyed large stretches of coastal and mangrove forests in the Andaman & Nicobar Islands. It also resulted in a tilt in the land with the southernmost Nicobar Islands having sunk by about 1.6 meters while the Northern most Andaman Islands raised by about 1.2 meters. Considering these, the present project focusing on littoral forests including mangroves in the coastal areas of the Nicobar Islands was taken up. Through this project, SACON identified locations of poor colonization that needs to be appropriately restored with species belonging to littoral forests.
- To strengthen the community conservation efforts by locals in north-eastern most state of the country Nagaland, a three-year program focusing on five eastern villages of the state was undertaken which culminated in this year. During this program documentation was done on valuable indigenous ecological knowledge, effectively communicate the need for nature conservation, and facilitate formation of a few community

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conservation. areas. One of the important findings was that a such as programme should be extended to other districts of Nagaland and more than that a long term programme with appropriate funding needs to be taken up to keep up the tempo.

- SACON assessed 20 wetlands spreading over four districts of Andhra Pradesh and documented the flora and fauna available in those areas under the program 'Biodiversity assessment for environmental monitoring of medium/minor irrigation schemes in Andhra Pradesh' Study of biodiversity in select wetlands of other districts is also progressing. Applications in free and open source geospatial tools has been effectively demonstrated in one of the studies on Environmental conservation at Bhavanpadu Thermal power plant, Srikakulam district, Andhra Pradesh. Program for coastal wetland mapping of Kerala, as a part of an exercise by the Kerala biodiversity board to document the wetlands of Kerala, could delineate 66,568 ha coastal wetlands in 9 districts of Kerala generating relevant statistics handy for conservation actions. SACON also have taken up an ecological status survey of the wetlands of Srikakulam district, Andhra Pradesh as required by the MoEF. The study would be completed shortly.
- Indian Space Research Organization (ISRO) has undertaken a project covering the entire country addressing the concerns on land use change, human vulnerability and environmental change at the river basin level. As part of this exercise, the present study aims at documenting the land use and land cover dynamics in entire river basins of India during the last 30 years. During the current year, the MoEF under the chairmanship of Prof. Madhav Gadgil constituted an expert panel on Western Ghats Ecology to recommend measures for conservation and to help delineate Ecologically

Sensitive Areas (ESAs) in the Western Ghats using the Geographic Information system framework. Upon request from the Expert panel we assessed the levels of Ecological Sensitivity of entire stretch of the Western Ghats.

- SACON entered into a technical service contract with the Water Institute, Karunya University to evaluate the Wetland Ecology component for the project "Monitoring and Evaluation of Loktak Lake Management" being implemented by the Loktak Development Authority, Manipur. Evaluation of the water bird monitoring was done in collaboration with Forest Department-wildlife wing, Manipur and recommendations submitted on both research and management components.
- As part of our ecotoxicological research, a comparative study of pesticide residues between organic and chemical farming in Padayetti village, Kerala was undertaken where it was found that significant difference in pesticide residue accumulation is there between the two systems of farming. As part of the work to assess Environmental Contaminants in birds in India 125 dead individuals were examined belonging to 30 species of birds and found DDT to be highest in concentration followed by total HCH and total endosulfan. Recently studies were also initiated on investigation into Endosulfan persistence in Kasaragod and its impacts on human health and environment. As part of Environmental Assessment programme, SACON drafted Management Action Plan for Ousteri Lake, Puducherry and submitted the same to the forest department to pursue it further. Other works include i) Impact of survey for drilling operations by M/s Oil India Ltd on wildlife and avifauna at Kakinada, Andhra Pradesh, ii) Impact assessment of LNG terminal augmentation project by M/s PLL on the terrestrial flora and fauna at Puthuvypeen, Kerala, iii) Monitoring the impacts of Jangi Wind

- Power Farm (91.8 MW) with special reference to Birds and Bats, and iv) Baseline Environmental data collection for Mithiviridi Nuclear Power Plant during this year.
- SACON has been pursuing our nature education programs in right earnest. Several programmes were undertaken for Coimbatore and neighborhoods having conducted camps for school students and teachers and nature education competitions for students. Programs are also supported for training forest officials and summer courses organized by local universities. Coordination is also being done for the DBTs Natural resources Awareness Clubs for School Children, an initiative of the National Bio-resource Development Board (Department of Biotechnology, Government of India). In the A & N Islands, it is progressing well and has offered good exposure to the local school children.
  - SACON organized the first International Conference on Indian Ornithology (ICIO - 2011), during 19-23 November, 2011. The conference was inaugurated by Dr Dilip Kumar (DG of Forests & Special Secretary, MoEF, Government of India) and the inaugural function was presided over by Mr Lavkumar Kachar, noted veteran conservationist. Noted environmental economist, Prof Paul P Appasamy (Vice Chancellor, Karunya University), and Dr AR Rahmani (Director, BNHS) delivered Felicitation addresses. About 250 participants, including special invitees, attended the conference for 3 days. The Pre-conference workshop scheduled on 19th November was also well received. Experts from abroad included Drs Pamela C. Rasmussen (Michigan State University, USA), Rhys Green (Royal Society for the Protection of Birds and Department of Zoology, University of Cambridge, UK), Mohammad Ali Reza Khan (Dubai Zoo, UAE), Christopher Bowden (RSPB, UK),

Trevor Price (University of Chicago), and Ian Barber (RSPB, UK), while delegates from India included almost all senior ornithologists as well as younger generation of researchers, across the country. Mr Hem Pande, Joint Secretary to Government of India, MoEF chaired one session, delivered talk on COP-11, and chaired the valedictory session on 22<sup>nd</sup> November 2011.

- As per a commitment to the human resource development in the field, SACON has 25 students working for their PhD degree. SACON entered also into a Memorandum of Understanding with Indira Gandhi National Open University (IGNOU), New Delhi to conduct joint programmes in the areas of Environmental Impact Assessment and Management in distant education mode. It is planned to undertake a course of ornithology along the same line.

#### **Centre for Environmental Management of Degraded Ecosystems (CEMDE), University of Delhi, Delhi**

- The Centre of Excellence Programme of MoEF at Centre for Environmental Management of Degraded Ecosystems (CEMDE), University of Delhi has been engaged in: (i) development of technologies for ecological restoration of abandoned mined out sites, overburden dumps (OBDs) of coal mined areas and degraded forest ecosystems of Aravalli, (ii) management of invasive species especially *Lantana* in forests ecosystems, (iii) management of grasslands in protected areas, (iv) preparation of new flora of Delhi and (v) training of stakeholders as a part of capacity building in action research in the areas of environment and ecology. The major achievements made during 2011-2012 are as follows:
  - A site-specific restoration technology has

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been developed for the stabilization of fine iron ore dumps. Using this technology, a 10 acre experimental plot at the fine ore dump of National Mineral Development Corporation (NMDC) at Bachelu was successfully vegetated using native grass species and other woody elements through ecological restoration. A highly degraded forest ecosystem in the Beed area of Vidya Bhawan Society in Udaipur range of Aravalli hills was successfully ecologically restored through restoration ecotechnology developed under the programme.

- As part of new initiatives undertaken in the programme, ecological restoration of overburden dumps (OBDs) of Coal Mines has been taken up. Two OBDs each having an area of 8-10 hectares was selected for ecological restoration at Coal fields of Bharat Coking Coal Limited (BCCL) and two OBDs each having 10 hectares were selected for ecological restoration in Coal fields of Central Coal Fields Limited (CCL).
- The cut rootstock method developed under the Centre of Excellence Programme has been used extensively to remove *Lantana* successfully from different parts of the Corbett Tiger Reserve. A strategy has also been developed to address the problem of reinvasion of *Lantana* in landscapes from where it was removed.
- Based upon the studies of different populations sampled from different locations in the country, a new species of *Lantana* has been proposed. For the first time two novel invasive traits that make *Lantana* multiply and spread rapidly has been observed. The concept of *Lantana* free zone has been evolved for successful eradication of *Lantana* in forest ecosystems. *Lantana* free zone is the size of landscape unit equivalent to home range of *Lantana*'s frugivorous mutualists.
- Five threatened native species of flowering plants in Delhi were relocated and New Flora of Delhi State is being prepared.
- Studies on grassland management in Corbett Tiger Reserve revealed that: (i) unusual ecological succession of 35 different single alien species dominated communities were observed in flooded (for three months) lowland grasslands of Dhikala after receding flood waters, (ii) these weedy communities were subsequently replaced by grasses regenerated from old clumps and new clumps developed from seed bank/seed migrated from upland grasslands, (iii) the heavy herbivore pressure on upland nonflooded grasslands, when the lowland grasslands were flooded, mimicked annual fire regime in the removal of biomass and also stimulation of basal meristems of grass rosettes, and (iv) the upland grasslands, which were browsed by herbivores, were regenerated in the same way as those subjected to annual fire regime suggesting that browsing mimicked annual fire regime. These observations are critical in the management of grassland ecosystems.
- Two workshops were organized jointly with the Wildlife Division of Forest Department of Uttar Pradesh at Dudhwa Tiger Reserve, Dudhwa. One workshop on the "Wildlife Habitat Management: Biological Invasions" was conducted for Chief Conservators, Divisional Forest Officers and Sub-divisional Forest Officers of UP, and about 30 officers participated in the workshop. The second workshop was organized for Range Officers and Forest guards on the Management of *Lantana* in Forest Ecosystems, and about 30 participants attended the workshop. The third workshop on Management of *Lantana* and Habitat Restoration in Forest Ecosystems was organized at the Corbett Wildlife Training Centre, Kalagarh and about 57 staff and officials consisting of

Foresters, Rangers, SDOs and DFO from the Uttarakhand Forest Department participated in the workshop.

### Madras School of Economics, Chennai

The Centre of Excellence in Environmental Economics was set up on the basis of a MoU in 2002 between the Ministry of Environment & Forests and the Madras School of Economics and was extended for the duration of 11<sup>th</sup> Five Year Plan. The main objectives of the Centre are to carry out research on issues related to Environmental Economics in project mode, maintain a state-of-the-art website on environmental economics and provide policy assistance to the Ministry. During the year 2011-2012, the Centre continued its work ongoing projects on 'Trade and Environment: India's Export of Textile and Textile Products and Environmental Requirements' and 'Economy-wide Impacts of Pollution in India: Meta Analysis'. Two issues of the newsletter, 'Green Thoughts' were published during the year.

#### Projects/Policy Inputs

- The Centre continued its work on the project '*Economy-wide Impacts of Pollution in India: Meta Analysis*'. The project aims to use meta-analysis of studies relating to air and water pollution to assess macro-level estimates of overall impacts of pollution in India.
- The Centre has prepared the draft report of the project 'Trade and Environment: India's Export of Textile and Textile Products and Environmental Requirements' addressing, inter-alia, issues like: status of pollution abatement in textile industry in India, trade competitiveness of Indian textile industry, assessment of pollution abatement costs in textile industry (with focus on textile processing), and linkages between pollution abatement and textile trade.
- The Centre has provided policy inputs to the Ministry on 'India 2030 – Vision for an Environmentally Sustainable Future' –

A World Bank report; 'National Manufacturing Policy'; 'Road Map for Green National Accounting System' and for 'Union Budget 2012-13'.

#### Environmental Economics Website

The Centre's state-of-the-art website <http://coe.mse.ac.in> has been updated to make it more user friendly. Efforts have been made to augment the database on Environmental Economics literature. A number of Indian studies have also been added to the database. The website is serving as one-stop destination for users interested in Environmental Economics related issues in India. Under various sub-disciplines of Environmental Economics and Resource Economics, about 7500 articles published in referred journals have been categorized. This searchable database enables the users to access information and the abstract of the publications and also provides scope for carrying out comprehensive literature review.

#### Newsletter

The Centre brought out two issues of newsletter, 'Green Thoughts', during 2011-12. The newsletters summarize the work done at the Centre on various ongoing projects. The issue of March 2011 focused on 'Water Pollution and Waste Water Treatment' and the issue of November 2011 focused on 'Green Economy'.

#### Foundation for Revitalization of Local Health Tradition (FRLHT), Bengaluru

The Centre of Excellence on Medicinal Plants and Traditional Knowledge at Foundation for Revitalization of Local Health Tradition (FRLHT), Bengaluru was initiated during 2002-03 to bring to the focus and address the various issues related to conservation and sustainable utilization of medicinal plants. In the course of its activities, the Centre has created a national Bio-cultural herbarium of medicinal plants and an ethno-medicinal garden, both of which have very rich

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collections of Medicinal plants. Besides, the Centre engages in: a) pharmacognostic studies on the controversial plant raw drug groups in trade, b) building capacities of different stakeholder groups about various issues related to medicinal plants, through its capacity building courses, workshops and training, c) preparing a GIS based Atlas of distribution maps of medicinal plants to help forest managers in planning conservation action, d) Well-referenced educational CD-ROMs on medicinal plants used in Siddha, Unani and Homoeopathic systems of medicine.

Following are the highlights of the progress during the year under its different key areas:

- Bio-Cultural Herbarium: Development of unique Bio-cultural Herbarium of Indian Medicinal plants was one of the key tasks. Towards this end, the botanical team of the Centre engaged in floristic surveys in different locations of Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Rajasthan, Manipur, Meghalaya, Sikkim and Himachal Pradesh which resulted in the collection of about 1300 plant specimens corresponding to 150 species.

In order to make the collection at the Herbarium more Education friendly, the collections were grouped around 10 select themes. Further, 2500 images of plants including their medicinal parts and habitat, and scanned images of about 550 Herbarium sheets were added to the image library in an attempt to make it into a Virtual one. During the year, about 325 samples procured from different markets and field sites from across the country were added to Raw drug repository.

- Ethno-Medicinal Garden: During the year, the collections at the ethno medicinal garden were further diversified by adding two more themes, vu., Endemic and Rare plants, Plants used in Unani system of Medicine.

- Pharmacognosy Studies: During the year, Phyto-chemical screening of three accessions of *Berberis aristata* were completed. Profiling and quantification of Embelin and Kiritiquinone in Vidanga candidates completed. Besides, Comparative phyto-chemical screening of four abhavadravya candidates of Ativisha-Musta done.

- Distribution Mapping: During the year, Geo-distribution maps for 250 species and Eco-distribution maps for 25 species were prepared. The revised and upgraded version of Digital Atlas, incorporating Geo-distribution and Geo-distribution maps has been completed.

- Outreach (Training & Educational material on Plants of ISM): Final draft of "Operational Guidelines for Conservation and Management of Medicinal Plants resources in India" was circulated among subject experts. Course contents for the Capacity Building course on "Medicinal Plants Conservation" for the Front line staff of Jharkhand was taken up. Memorandum of Understanding (MoU) with the Karnataka Knowledge commission was signed, for sharing select information in Kannada which will be uplinked to its Wikipedia portal.

A prototype of the CD-ROM on "Plants in Ashtanga Sangraha" was prepared and sent to subject experts for peer-review.

### **Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram**

Tropical Botanic Garden and Research Institute (TBGRI) was established by Government of Kerala as an autonomous R&D organization in 1979 to facilitate conservation and research on tropical plant resources in general and of the country and the Kerala state in particular. The Institute was brought under the society established by the

State Government namely "Kerala State Council for Science, Technology and Environment" (KSCSTE) in 2003. The institute is located at about 40 km northeast to Thiruvananthapuram city and maintains a 300 acre conservatory garden for the wild tropical plant genetic resources of the country, besides a well integrated multidisciplinary R&D system dealing with conservation, management and sustainable utilization of tropical plant resources.

### Activities undertaken so far

The Institute was recognized as a National Centre of Excellence in *ex-situ* conservation of tropical plants in 1997 and a number of significant achievements have been made by the Institute, some of which are listed below:

#### - **Development of Infrastructure facilities for Eco-Education**

The Institute has established visitors centre for dissemination of information and to create awareness among students. For this purpose, 50 exhibit materials have been developed on various eco systems. Nearly 32,000 visitors visited the garden including the indoor stalls. 5,000 brochures were printed and distributed. Public amenities like drinking water, nature trails and audio visual aids were established.

#### - **Collection of Endemic and Rare Endangered & Threatened (RET) germplasm**

Twenty five explorations were conducted in the Western Ghats and 800 live specimens representing 105 species were collected. This material was used for standardizing mass multiplication in natural habitat.

#### - **Standardization of propagation techniques of Rare Endangered & Threatened (RET) species.**

Standardization of propagation of

protocol has been envisaged under the scheme in assistance to botanic gardens in its Lead garden programme. During the period, conventional propagation technique were standardized

#### - **Establishment of Rare Endangered & Threatened (RET) species park**

The park is developed in five acre plot and during the year 527 seedlings which include 44 RET species and 52 Endemic of Western Ghats were accomplished.

#### - **Reintroduction, Monitoring and Evaluation**

About 750 seedlings were reintroduced in natural condition in various parts of Western Ghat.

#### - **Establishment of Herbarium and training in Integrated Taxonomy**

Herbarium was upgraded by constructing 350 sq. mts as an additional space in the 1<sup>st</sup> floor of existing building. Ten herbarium cabinets were added. During the period 3000 species were identified and added in the Herbarium. A training programme was organized as part of human resource development.

#### - **Technical Assistance to Smaller Botanic Gardens**

The Institute assisted four organizations in the region mostly colleges on exploration trips, identifying plant specimens, supplying plant materials, assisting in layout and construction of green houses etc.

### **Centre for Animals and Environment, CARTMAN, Bengaluru**

The Project on Centre of Excellence for Animals & Environment (CAE) awarded by the Ministry to CARTMAN, Bengaluru in 2000 and discontinued after two years for administrative reasons was resumed during 2009.

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The main objective of the Project is to study the mutual dependence and inter-relationship between the Animals (LIVESTOCK) and Environment (Plant Life) and initiate steps to preserve environment and to improve the health and welfare of animals by making them more productive. Another activity envisaged is to eliminate pollution of environment caused by City based Abattoirs by providing alternate locations where animals are born and reared. This would also result in development of rural areas by retaining the Value added in the process in villages and nearby towns.

### Activities undertaken during the year

The work taken up during the year 2011-12 is an extension of the two year project by CARTMAN during the year 2009-2011.

This Centre is the only one having correlation between Animals (Livestock) and Environment(Plant Life) for their interdependence and mutual benefit. Major activities undertaken under Livestock are on the importance of Modernization of Bullock Carts for better productivity, operational efficiency and Animal friendliness and the other the Modernization and relocation of Slaughter Houses from consideration of Livestock Welfare, prevention of cruelty during transportation and slaughter, production of hygienic meat, pollution control in cities and better utilization of by-products slaughter. In respect of Plant Life, CARTMAN has established a Bio Diversity Park in Bangalore City where there is Diversity comprising Endangered Species, Medicinal Plants, Fruiting, Flowering, Ornamental and general purpose plants and trees including a Navagraha Garden, Demonstration of Renewable Sources of Energy, Vermi composting, Water Conservation, etc. A building constructed will screen educational programme for school children on Environment, Natural resources and sense, etc for their awareness and understanding.

Under the Project a Web Site “livestock-nature-development.org” has been hoisted for persons to access information on Livestock, Conclusion and Recommendations on the work done under CAE Project and a special facility created under Technical Services where data and fabrication drawings on six type of improved carts can be accessed by those wanting to fabricate CARTMAN’s Improved Bullock Carts.

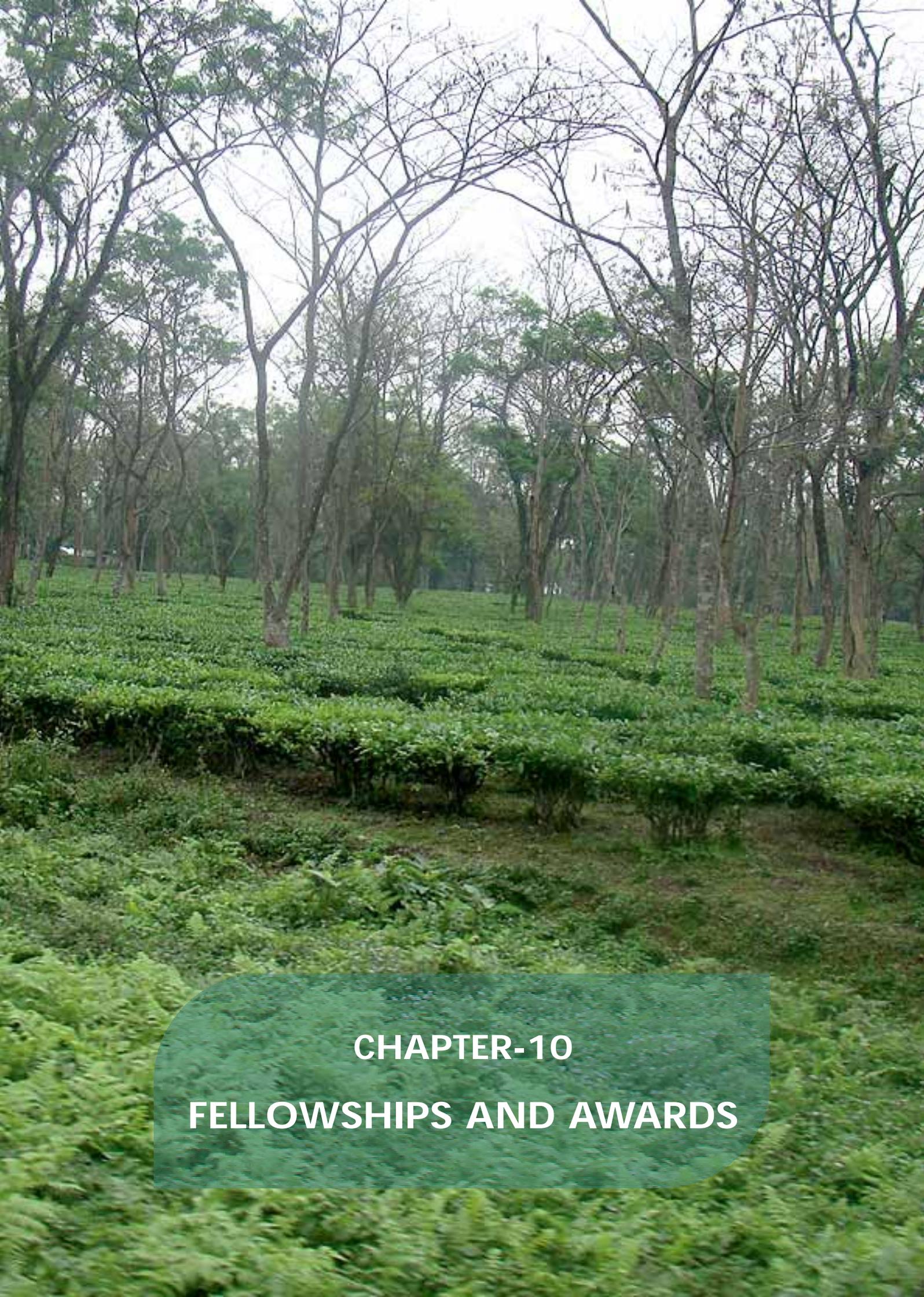
In collaboration with the Karnataka Veterinary Animals and Fisheries Science University (KVAFSU) the Centre would be undertaking training of persons in Meat trade from the points of view of Animal Welfare, Production of Hygienic Meat, Prevention of Cruelty to animals during transportation and slaughter, etc and also demonstrate modern methods of Slaughter of animals.

During the year under Technical Services in our Web Site CARTMAN have hoisted Government schemes for funding assistance on Modernization of Slaughter Houses, Rural Abattoirs, etc., for access by interested parties.

During the year under review, CARTMAN planted nearly 150 plants including Endangered species of Medicinal Plants:

<i>Endangered Species</i>	<i>Nos.</i>
of Medicinal Plants.	25
Coffee Plants	25
Jack fruit trees	20
Betall Nut trees	50
Banana trees	18
Veeti (Rosewood)	11
Sooseberry	4
Sapota	5
Mango	4
Butter fruit trees	2

Also developed two small plots for Flowers and Vegetables.



**CHAPTER-10**  
**FELLOWSHIPS AND AWARDS**

## Indira Gandhi Paryavaran Puraskar (IGPP)

### Introduction and Objectives

In reverential memory of late Prime Minister Smt. Indira Gandhi, the Ministry of Environment and Forests, in the year 1987, instituted an award called "Indira Gandhi Paryavaran Puraskar " to give recognition to those having made or have the potential to make the measurable and major impact in the protection of environment. In the beginning, a cash prize of Rs.1,00,000/- was awarded to deserving individual/organization of India. Since 1991, the prize of Rs.1,00,000/- each were awarded separately to individual and organizational category. From the year 2002, the prize money has been enhanced to Rs.5,00,000/- in each category. Subsequently, the "Regulations" governing the IGPP was revised from the year 2005 onwards. As per the revised regulations, one prize of Rs.5,00,000/- under the Organisation category, and two prizes of Rs.3,00,000/- and Rs.2,00,000/- each to individuals in the Individual category shall be given annually. As per the revised regulations from the year 2009 onwards, two prizes of Rs.5,00,000/- each under the Organisation category, and three prizes of Rs.5,00,000/-Rs.3,00,000/- and Rs.2,00,000/- each to individuals in the Individual category shall be given annually. Along with the cash prize, each awardee is given a silver lotus trophy and a citation. Any citizen of India or organization working in India for the cause of environment is eligible for the award. There is no age limit for the nomination for individual.

The regulations governing IGPP was again revised from the year 2010 onwards. As per the revised regulations, any citizen of India having at least 10 years work experience in the field of Environment

(substantiated in support of his experience by published/ field work)/ NGO working in the field of environment with at least five years experience/ Environment and Forests Departments of States/ UTs/ State Pollution Control Board/ District Collector/ Magistrate can propose a name of any citizen or organization of India who has at least five years working experience in the field of environment in the prescribed proforma. Self nominations and nominations proposed by relatives are not considered. The advertisement will be issued on 15<sup>th</sup> July every year. The last date for receipt of nominations shall be 15<sup>th</sup> September every year.

Short listing of the nomination is carried out by three Expert Members selected by the Prime Minister's Office. The environmental Prize Committee constituted under the Chairmanship of Hon'ble Vice President of India select the awardees. The composition of the Prize Committee is as follows:

- Vice -President of India (Chairman)
- Speaker of Lok Sabha
- Minister of Environment and Forests
- Three Expert Members
- Secretary Ministry of Environment and Forests (Member Secretary)

The three Expert members are being selected by PMO from a panel of 9 eminent environmentalists/eminent persons prepared by the Ministry of Environment and Forests.

While selecting the awardees the term "environment" is interpreted in the broadest sense possible and comprising of following areas of work:

- Prevention of Pollution.

- Conservation of Natural Resources.
- Rational use of depletable resources.
- Environmental Planning and Management.
- Environmental Impact Assessment.
- Outstanding field work (innovative research work) for enrichment of environment e.g. afforestation, land reclamation, water treatment, air purification etc.
- Environmental Education.
- Creating awareness of environmental issues.

### Present Status

For IGPP-2009, two awardees under organization category have been selected in the meeting of the Prize Committee under the Chairmanship of Hon'ble Vice President of India held 29<sup>th</sup> June, 2011. As no one was found suitable for award under individual category Prize Committee formed a search Committee comprising of all the three Experts to suggest few names to be considered under individual category. The Prize Committee decided that after the verification of the suggested candidates the Ministry, these will be placed before the Prize Committee for selection of awardees under individual category for IGPP-2009.

The nominations received for IGPP-2010 have been processed. Short-listing of the nomination is being carried out by the three experts selected by PMO. The ground truth verification of the short-listed nominations will be carried out by the Regional Offices concerned of the Ministry.

Advertisements for inviting the nominations for IGPP, 2011 were issued in national dailies with regional coverage on 15<sup>th</sup> July 2011. The nominations for IGPP-2011 under both the individual and organization category have been received. Various activities as per the regulations applicable for IGPP-2011 are under process.

### Indira Priyadarshini Vriksha Mitra (IPVM) Awards

The Indira Priyadarshini Vriksha Mitra (IPVM) Awards were instituted in 1986 to recognize the pioneering and innovative contribution made by individuals and institutions in the field of afforestation/wasteland development every year.

From the year 2011 the IPVM Awards have been increased from existing four categories (since 2006) to following seven categories:-

1. Individual - Forest Officers
2. Individual - Other than Forest Officers
3. Institutions/Organisations under Government
4. Joint Forest Management Committees (JFMCs) (six awards region-wise)
5. Non-profit making Voluntary Organisations (NGOs)
6. Corporate Sector (Private/Public Sector Agencies)
7. Eco-Clubs at School Level (covered under National Green Corps Programme of the Ministry of Environment and Forests)

Note: i). Awards under category Individuals, both Forest Officers and others, should

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be in recognition of personal contribution demonstrating extra efforts beyond call of routine duty.

- ii) Officials (other than Forest Officers) working in Government Departments including Forest Department and private individuals will come under category 2.
  - iii) Six regions for the purpose of IPVM awards to JFMC will be **North** (Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttaranchal, Uttar Pradesh and UT of Chandigarh), **East** (Bihar, Jharkhand, Orissa and West Bengal) **West** (Goa, Gujarat, Maharashtra, Rajasthan, UT of Dadara & Nagar Haveli, UT of Daman & Diu and UT of Lakshadweep) **South** (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, UT of Andaman & Nicobar Islands, UT of Pondicherry) **Central** (Madhya Pradesh and Chhattisgarh) and **North East** (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura)
- Only one award is given in each category.
  - Cash prize of Rs.2.5 lakhs along with Medallion and Citation is given for each category.
  - Nominations of Government servants/ Govt. Institutions/Organizations are forwarded through the Head of the

Department/Organization concerned and those from JFMCs may be forwarded by the PCCF concerned.

The IPVM Awards for the year 2010 were conferred on 19<sup>th</sup> November, 2010. Sh. A.T. Mishra, DFO Dhalbhum Forest Division, Jamshedpur (Jharkhand) was given award under category "Individual including Government Servant". Forestry extension wing Tamil Nadu Forest Department, Chennai under category "Institution/organizations under Government" and Village Forest Protection & Management Committee" Dani Talai Rajasthan under category "Joint Forest Management Committee" were also given award for the year 2010.

The exercise for IPVM Awards for the calendar year 2011 is under process.

### IPVM Awards for States and Union Territories

The IPVM Awards for States and Union Territories were instituted in the year 2008 for enhancing the percentage of Forest and Tree Cover in States/UTs. The Awards are divided into three categories and only one award is given in each category (Table-49).

The IPVM Awards for States/UTs were conferred upon on 19<sup>th</sup> November, 2010. Next IPVM Awards for States/UTs are due in the calendar year 2012.

**Table-49.** Categories and prize of IPVM Awards

Sl.No.	Category	Award	Awards for 2010
a)	Big State having geographical area of 80,000 Sq. Km and above	Rs.8.00 lakhs (one)	J&K
b)	Small State having geographical area below 80,000 Sq.Km.	Rs.5.00 lakhs (one)	Mizoram
c)	Union Territories	Rs.5.00 lakhs (one)	UT of Chandigarh

### **Pitamber Pant National Environment Fellowship**

Pitamber Pant National Environment Fellowship Award instituted in 1978 is awarded every year to encourage and recognize excellence in any branch of research related to the environmental sciences. The fellowship is awarded every year and is in recognition of significant important research/development contributions and is also intended to encourage talented individuals to devote themselves to R&D pursuits in the field of environmental sciences. The duration of the fellowship is two years. So far, 27 fellowship Awards have been given to various Scientists throughout the country. Fellowship Awards for the year 2007 and 2008 have been announced while for the year 2009 and 2010 nomination have been obtained and are under process.

### **B.P.Pal National Environment Fellowship Award for Biodiversity**

B.P.Pal National Environment Fellowship Award for Bio-diversity was instituted during 1993 and is awarded annually with a view to further develop, deepen and strengthen the expertise on Bio-diversity available in the country.

The fellowship is in recognition of significant important research and development contributions and is also intended to encourage talented individuals to devote themselves whole-time to R&D pursuits in the field of Bio-diversity. Duration of the fellowship is two years. So far, 10 Fellowship Awards have been awarded to various scientists throughout the country. Fellowship Awards for the year 2007 and 2008 have been announced while for the year 2009 and 2010 nomination have been obtained and are under process.

### **National Environmental Sciences Fellows Programme**

During the year 2009-10 the Ministry has launched to institute the MoEF – National Environmental Sciences Fellows Programme for Indian Scientist desirous of working at the forefront of environmental sciences and engineering with a focus on problem solving environmental research in collaboration with ten top environment schools in India to begin with, who would be functioning as host Institutions. The areas of research to be undertaken in the thrust areas have been identified by the Ministry. During the year 2011-12, three fellowships have been initiated.

### **Mahatma Gandhi Chair for Ecology and Environment**

The Ministry has started new chair for institution of Mahatma Gandhi Chair for Ecology and Environment during the year 2009-10. The selected Fellow for the Chair will work on one of the thrust areas of Research identified by the Ministry. The Fellow could be from any discipline of Science, Engineering, Social Work, Art and Humanities. There is no upper age limit. The candidate must be at the level of a University Professor or equivalent grade Scientist in his parent Institution either serving or superannuated.

The Ministry has set up Mahatma Gandhi Chair for Ecology and Environment at the Centre for Biodiversity Studies in Baba Ghulam Shah Badshah University, Rajouri, Jammu and Kashmir. The process for selection of the chair has been completed.

### **E.K. Janaki Ammal National Award on Taxonomy**

Biological diversity refers to the variability in the living organisms and the ecosystems of which they form part. Preservation of biological

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diversity is vital for maintaining ecological balance and for evolutionary processes. It has direct bearing on food security, agriculture, medicine, industry etc. The advances in biotechnology and development of products based on the use of biological resources are increasingly becoming motivating factor for greater use of biological resources.

Taxonomy is the science of identification, classification and naming of living organisms. Taxonomic work involves study of morphological characteristics and phylogenetic relationship of organisms which is essential for applied biological sciences, such as medicine, agriculture, forestry and fisheries. Development of biotechnologies and their industrial applications depend heavily on taxonomy. Current requirements of taxonomic work and available expertise and studies indicate urgent need for encouraging excellence and for motivating experts to work in hitherto neglected groups of organisms e.g. microbes, lower groups of plants, animals etc. The challenge is quite serious, as while the existing expertise is ageing and retiring, not many young scholars are opting for studies in taxonomy.

In order to encourage work of excellence in taxonomy and also to encourage young students and scholars to work in this field of science, this award, named after the late Prof. E. K. Janaki Ammal was instituted in the year 1999. Late Prof. Janaki Ammal did taxonomic work of outstanding merit and excellence, particularly in the area of cytotaxonomy and has been a source of inspiration to many young scientists.

Initially there was one Award on Taxonomy covering all the three fields viz. Botany, Zoology and study of Micro-organisms. It has now been decided to enlarge the scope of the Award and increase the number of

Awards to two, one each for excellence in Plant and Animal Taxonomy. The outstanding work done in Microorganisms will also be eligible for consideration under either of the two categories, as the case may be. The two Awards will be known as 'E.K. Janaki Ammal National Award on Plant Taxonomy' and 'E. K. Janaki Ammal National Award on Animal Taxonomy'.

The award will be given on the 5<sup>th</sup> June, coinciding with the World Environment Day. Each award will carry Rs. 1,00,000/- in cash along with a citation, scroll and Medallion. The Awards will be given to the Taxonomists selected by a Selection Committee, under the Chairmanship of Secretary (E&F), constituted for this purpose.

### **National Awards for Prevention of Pollution and Rajiv Gandhi Environment Award for Clean Technology**

The National Awards for Prevention of Pollution and the Rajiv Gandhi Environment Award for Clean Technology are given each year, in the following identified categories of highly polluting industries, which have made a significant and measurable contribution towards development or use of clean technologies, products or practices that prevent pollution and find innovative solution to environmental problems:-

#### **Large Scale industries:**

- 1) Sugar
- 2) Fertilizer
- 3) Cement
- 4) Fermentation and Distillery
- 5) Aluminium
- 6) Petro-chemicals
- 7) Thermal Power
- 8) Caustic Soda
- 9) Oil Refinery
- 10) Sulphuric Acid
- 11) Tanneries
- 12) Copper Smelting
- 13) Zinc Smelting
- 14) Iron and Steel
- 15) Pulp and Paper
- 16) Dye and Dye Intermediates
- 17) Pesticides
- 18) Pharmaceuticals.

### Small Scale Industries:

1) Tanneries 2) Pulp and Paper 3) Dye and Dye Intermediates 4) Pesticides 5) Pharmaceuticals.

The National Awards for Prevention of Pollution are bestowed on 23 industries (18 large scale and 5 small scale industries), one each for the above mentioned categories of industries based upon their performance during the Award financial year.

The Rajiv Gandhi Environment Award for Clean Technology is given to the one which is the best among these industries, particularly from the angle of adoption of the clean technology. The Awards comprise a Cash Award of Rupees Two lakh in addition to a silver Trophy and a Citation.

The National Award for Prevention of Pollution for the year 2009-2010 was awarded to M/s Ultra Tech Cement Limited, Vikram Cement Works, Neemuch, Madhya Pradesh (under the Cement category) and M/s Aban Power Company Limited, Thanjavur, Tamil Nadu (under the Thermal Power category) for their commendable efforts towards conservation of energy and water, reduction in waste generation and commitment towards maintaining a safe, clean and healthy environment

Nominations were invited for the National Awards for Prevention of Pollution and the Rajiv Gandhi Environment Award for Clean Technology for the year 2010-2011. Sixty seven nominations have been received for the Awards for the year 2010-2011 and evaluation of the same are being processed for consideration of Award Selection Committee.

### Awards in the Wildlife Division

Wildlife Division in the Ministry provides the Rajiv Gandhi Wildlife Conservation Award, the Amrita Devi Bishnoi Wildlife Protection Award and fellowships, namely, the Salim Ali Fellowship and Kailash Shankhla Fellowship for outstanding work in the field of wildlife conservation.

#### Rajiv Gandhi Wildlife Conservation Award

The Rajiv Gandhi Wildlife Conservation Award is given annually for significant contribution in the field of wildlife conservation which has made, or has the potential to make, a major impact on the protection and conservation of wildlife in the country. Two awards of Rupees One lakh are given to education and research institutions, organisations, forest and wildlife officers/research scholars or scientists/wildlife conservationists. During the year, process for grant of the award for the year 2010 has been undertaken, and the finalisation of the awards is under consideration.

#### Amrita Devi Bishnoi Wildlife Protection Award

The Amrita Devi Bishnoi Wildlife Protection Award is given for significant contribution in the field of wildlife protection, which is recognised as having shown exemplary courage or having done exemplary work for the protection of wildlife. Two cash awards of Rupees One lakh is presented to individuals and institutions involved in wildlife protection. During the year, process for grant of the award for the year 2010 has been undertaken, and the finalisation of the awards is under consideration.

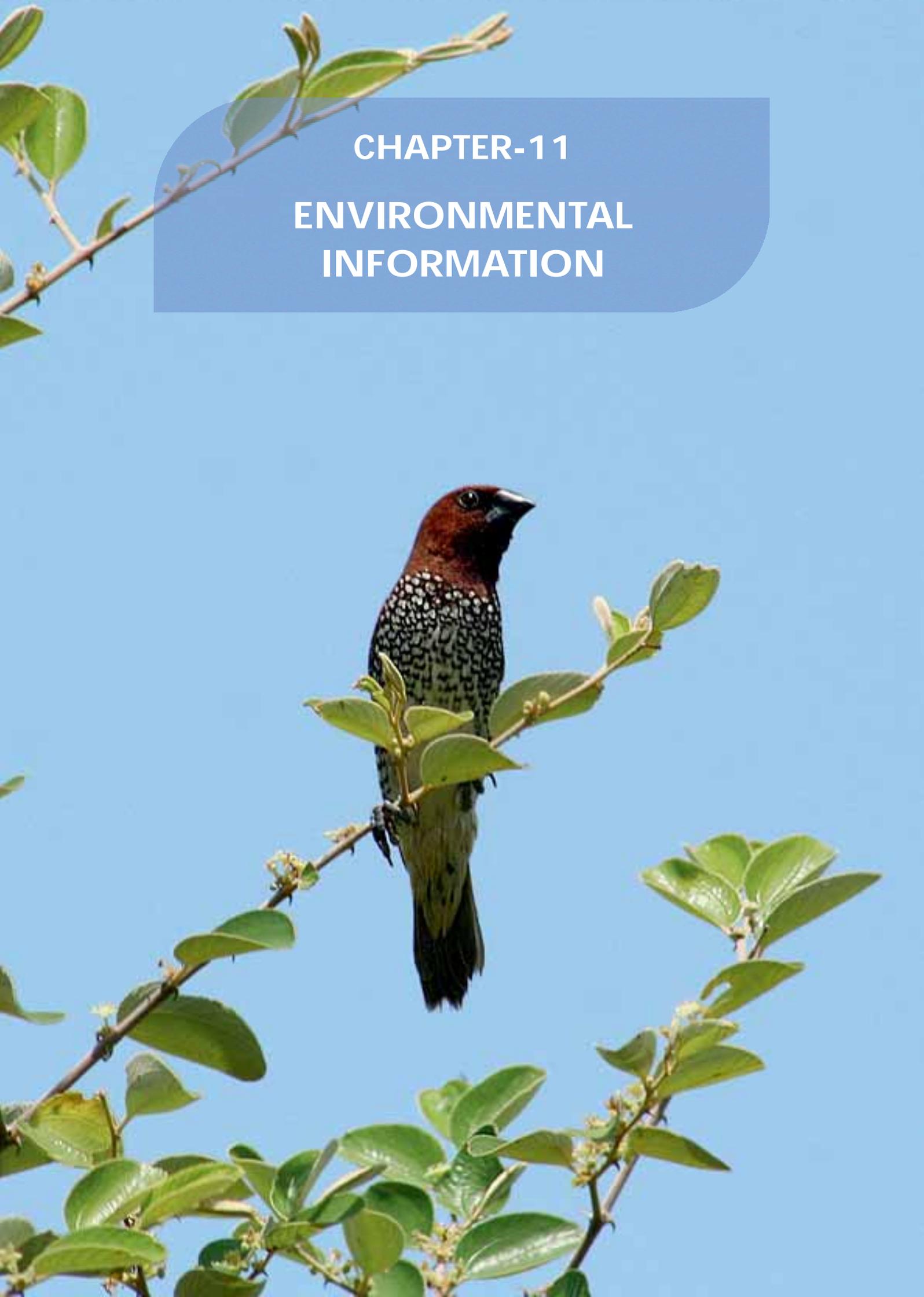
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## Salim Ali Fellowship and Kailash Sankhla Fellowship Awards

In order to commemorate the memory of the two great wildlife conservationists of the country, Shri Kailash Sankhla and Dr. Salim Ali, the Ministry of Environment and Forests awards these two fellowships alternatively each year. The objective is to inspire and promote the country's wildlife managers and scientists to take up research or experimental

projects aimed at conserving the rich wildlife heritage of India. The fellowship is awarded for a period of two years with a stipend of Rupees 4,000 per month. In addition, an amount of Rupees 18,000 per annum is given for meeting contingency expenses. Dr. Salim Ali National Wildlife Fellowship for the year 2011 is awarded to Ms. Monica, Senior Research Fellow, Wildlife Institute of India, Chandrabani, Dehradun (Uttarakhand).

**CHAPTER-11**  
**ENVIRONMENTAL**  
**INFORMATION**



## Environmental Information System (ENVIS)

### Introduction

Environmental information plays a vital role not only in formulating environmental management policies but also in the decision making process aiming at environmental protection and improvement of environment for sustaining good quality of life for the living beings. Hence, management of environment is key component and thus plays an important role in effecting a balance between the demands and resources available for keeping the environmental quality at a satisfactory level. Realizing such need Ministry set up an Environmental Information System (ENVIS) in 1983 as a plan programme as a comprehensive network in environmental information collection, collation, storage, retrieval and dissemination to varying users, which include decision-makers, researchers, academicians, policy planners and research scientists, etc.

ENVIS was conceived as a distributed information network with the subject-specific centers to carry out the mandates and to provide the relevant and timely information to all concerned. Further, association of the various State Governments/UTs was also felt necessary in promoting the ENVIS network to cover a wide range of subjects. The subject area for States/UTs ENVIS Centers was the status of environment and related issues. Thus, the network was expanded gradually with the involvement of thematic subject-areas and State Government/UT departments to make it a more comprehensive environmental information network.

ENVIS network at present consists of a chain of 67 network partners out of which 39 are on subject-specific and 28 on State/UT related issues. These network partners are called ENVIS Centers 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 assists the Environment Information (EI) Division in coordinating the activities of all the ENVIS network partners by making ENVIS a web-enabled comprehensive information system. The list of ENVIS network partners is given at Annexure-IX.

### Objectives

The long-term and short-term objectives of Environmental Information System (ENVIS) are as follows:

#### Long-Term Objectives

- To build up a repository and dissemination Center in Environmental Science and Engineering;
- To gear up state-of-art technologies of information acquisition, processing, storage, retrieval and dissemination of environmental nature;
- To support and promote research, development and innovation in environmental information technology.

#### Short-Term Objectives

- To provide national environmental information service relevant to present needs and capable of meeting the future needs of the users, originators, processors and disseminators of information.
- To build up storage, retrieval and dissemination capabilities, with the ultimate objective of disseminating information speedily to the users.
- To promote national and international cooperation and liaison for exchange of environment related information.
- To promote, support and assist education and personnel training programmes designed to enhance environmental information processing and utilizing capabilities.
- To promote and exchange of environment related information amongst developing countries.

## Progress / Achievements carried out during the year

The ENVIS network comprising both on the subject-specific areas and status of environment and related issues established under ENVIS scheme continued its information-related activities, database development, publication of requisite information packages through newsletters, abstracting services, etc. and also the query-response services during

the year. This was done by updating and maintaining an information base that includes both descriptive information as well as numerical data. Descriptive information in the form of publications, reports, reprints and abstracts on related subjects is stored for dissemination. Numerical data on the same subject are collected, compiled, processed and analyzed for the purpose of dissemination. Documentation in the form of publications



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**Meeting of the Hon'ble Minister with her visiting counterpart Mr. Erik Solheim**  
New Delhi, 1st February, 2012



Mr. Erik Solheim, Minister of Environment and International Development of Norway called on Hon'ble Minister Smt. Jayanthi Natarajan in her office. Minister Mr. Solheim is visiting Delhi to participate in the Delhi Sustainable Development Summit, being organised by TERI from 2-4 February, 2012.

[Press Release »](#)

**Tree Growers' Mela 2012**

Coimbatore, 23rd February, 2012



The Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore has organised Tree Growers Mela on February 23, 2012 where 1000 farmers from Tamilnadu, Kerala and Pondicherry participated. The Mela was inaugurated by Mrs. Jayanthi Natarajan, Hon'ble Minister of Environment & Forest, Govt. of India.

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**Slideshow**

Courtesy: **Devaang Jain**

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**India and Climate Change**

India's submissions to the UNFCCC Secretariat on Climate Change  
New Delhi, February 28, 2012  
[Read more »](#)

Joint statement issued by BASIC Ministers at the end of 10th BASIC Meeting, New Delhi.  
New Delhi, February 13-14, 2012  
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Draft Reports State Action Plan on Climate Change (SAPCC).  
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Joint statement issued by BASIC Ministers at the end of 9th BASIC Meeting, Beijing.  
[More on Climate Change »](#)

**Recent Updates**

- ▶ Statements of Hon'ble Minister at the 17th Conference of Parties (CoP 17), Durban
- ▶ 'Haathi Mere Saathi' campaign organized successfully
- ▶ India participates in the 10th CoP of Migratory Species of Wild Animals
- ▶ Minister inaugurates the first Indian Forest Congress, 2011
- ▶ *Voices From the Field* and other books released at IFC, 2011
- ▶ India hosts Ministerial Dialogue on "Green Economy and Inclusive Growth"
- ▶ Minister releases book at Delhi Ministerial Dialogue

**New Releases**

Order of Hon'ble National Green Tribunal dated 24.01.2012 in MA No. 30/2011 arising out of appeal No. 15/2011 in the matter of Satish Umesh Prabhu and Ors. Vs M/s Matoshri Infrastructure Pvt. Ltd. and Ors - Compliance thereof.  
Updated: March 13th, 2012

Office Memorandum - Guidelines for High-rise Buildings, regarding.  
Updated: March 1st, 2012

National Manufacturing Policy - measures for implementation pertaining to Ministry of Environment and Forests, OM.  
Updated: February 15th, 2012

Office Memorandum - Demwe Lower Hydroelectric Project: Consideration in Standing Committee of NEPAI  
[More »](#)

Fig-67. Ministry's website at URL: <http://moef.gov.in>

and reports are brought out. All the information thus compiled is made available on the websites of the respective Centers.

- 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. Information in the Ministry's website was continuously updated by ENVIS focal point throughout the year. The website (Fig.-67) has also been linked with the various Divisions of the Ministry in order to have up-to-date information on the subjects concerned. Besides, the website also regularly provides information on 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. The website recorded a huge number of hits per month reflecting the usage of website by various national and international users. Ministry's website has been revamped with better look, content and design adopting latest technologies and keeping in view the guidelines for development and management of government website to make it more transparent and user friendly. The process of migrating the website on an open-source content management system (CMS) has been initiated during the year. The new website will be more user friendly, database driven and dynamic with modern features such as browser independence and compatibility with mobile devices.
- A portal of ENVIS at url: <http://www.envis.nic.in> connecting all the ENVIS network partners is updated regularly by the focal point. The portal acts as a catalyst for inter-center interaction and for information on several broad categories of subject related to

environment under which the Centers have been established. The websites of all the ENVIS network partners could be directly accessed from the homepage of the portal giving information on major events, activities and current updates of the entire network. The ENVIS portal has been redesigned to give it a better look and make it user friendly. Online monitoring and evaluation system for ENVIS Network partners on a regular basis via the ENVIS Portal is under process of implementation.

- The audit of 36 ENVIS Network websites is in process with assistance from National Informatics Centre (NIC) with respect to Web Security Guidelines issued by Indian Computer Emergency Response Team (CERT-In). The websites will be bilingual i.e., English and Hindi or a regional language and will have features like archival process, dedicated sections for events/announcements, State of Environment (SoE) Reports and Photo Gallery etc. There will be secure control panel for ENVIS Centers to submit their monthly report, publications etc.
- A two-day user consultation workshop on restructuring and security audits of ENVIS network websites was organized with assistance from NIC held on 4-5<sup>th</sup> May, 2011 at Van Vigyan Bhawan, New Delhi in connection with redesigning, cyber security audit and identification/removal of vulnerabilities of identified 36 ENVIS Websites. Cyber security issues were discussed at length by Cyber Security Division NIC (CSDNIC). The participating ENVIS Centers actively interacted with the experts and peer centers on the subject. The template for ENVIS Centers was also finalized in this workshop.
- Query-Answer Service is one of the major responsibilities of ENVIS Network. The ENVIS focal point and all its partners

responded to a large number of queries during the year and provided substantive information as far as possible. The ENVIS network responded to more than 1,50,000 queries during the 11<sup>th</sup> Plan period on various subject areas on environment and its allied disciplines. Wherever, information is not readily available, the network provided 'Referral Service' to the concerned users. The major subject areas on which the queries were responded pertain to climate change, ozone layer, environmental conservation, environmental standards, environmental education and awareness, water and air pollution, waste management and environmental laws etc.

- ENVIS focal point coordinated and published the Annual Report 2010-11 of the Ministry and got it distributed to various Central and State Government Departments, professional institutions, universities, research organizations, embassies/High Commissions of various countries in India, etc. The electronic versions of current and previous Annual Reports are also available on the website of the Ministry.
- As a follow-up to the Hon'ble President of India's address to the Joint Session of the Parliament on June 4, 2009, Environmental Information Division of the Ministry published the first 'Report to the People on Environment and Forests 2009-10'. The purpose of the Report is to generate a national debate on environmental issues, which will form the basis for suitable revision in the policy framework, wherever required and ultimately result in improved performance in Environment and Forests Sector. The Report has been hosted in the Ministry's website and widely distributed to all the stakeholders concerned. The preparation of Report to the People on Environment

and Forests for the year 2010-11 is under process.

- The functioning of the ENVIS Network was monitored and evaluated by a Scientific Advisory Committee under the Chairmanship of Secretary (E&F). The suggested recommendations for the improvement of network made by the Scientific Advisory Committee held on 25<sup>th</sup> June, 2010 have been implemented/are in process of being implemented.
- At the instance of the Scientific Advisory Committee, a sub-Committee under the Chairmanship of Statistical Advisor and representatives from Finance and other subject Divisions was constituted vide Notification dated 19<sup>th</sup> August, 2010 to look into various aspects of the Scheme including framing new guidelines and also to strengthen the Scheme. The Committee has since submitted its report. Necessary follow-up action is being taken thereon.
- ENVIS Scheme is under the process of consolidation by rationalising the subject areas by closing some of the non-performing Centres. Accordingly, nine Centres have been closed. Besides, a revised Standing Finance Committee (SFC) proposal of the ENVIS scheme is under finalization.

#### **Activities of Some of ENVIS Network Partners during Year 2011-12**

- *ENVIS at Bombay Natural History Society (BNHS ENVIS), Mumbai*—The BNHS ENVIS deals with information on 'Avian Ecology and Inland Wetlands'. Activities of BNHS ENVIS during 2011-12 included creation of a bibliographic database of published literature related to avian ecology study; publication of newsletter; creation of databases on avian ecology; and query response services. The Center, in collaboration with Global Biodiversity Information Facility (GBIF), Denmark and

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Wildlife Institute of India (WII), Dehradun, published first peer-reviewed description of Indian bird dataset entitled, 'Literature based species occurrence data of birds of North-East India' in ZooKeys Journal in November 2011. The Center has replied to around 272 queries on Avian Ecology in 2011-12. The Center's website at url: <http://bnhsenvis.nic.in> is available in English, Hindi and Marathi. The website provides access to download published issues of newsletter 'BUCEROS' along with databases and other publications.

- *ENVIS at Botanical Survey of India (BSI ENVIS), Howrah, West Bengal*—The BSI ENVIS develops databases on its assigned area of thrust, i.e., floral diversity. Some of these databases include: Rare, Endangered and Threatened Plants of India (3 volumes), Common Medicinal Plants of West Bengal (in regional language), Some Allergic Pollen of Indian Angiosperms, etc. During year 2011-12, the activities of the Center included publishing of regular Newsletter, abstracts, books and pictorial guides of plants. The Center also provided query-answering services to national and international institutions. The Center can be accessed at url: <http://bsienvis.nic.in>.
- *ENVIS at Center for Advanced Study in Marine Biology (CASMB ENVIS), Parangipettai, Tamil Nadu*—CASMB ENVIS is housed at Faculty of Marine Science Annamalai University to offer its services to the stakeholders. The Center worked on creation and updation of databases on estuaries, mangroves, coral reefs and lagoons. The databases are available on Center's website at url: <http://casmbenvis.nic.in>. During 2011-12, CASMB ENVIS collected and catalogued 6728 abstracts and reprints of the scientific publications related to thematic area and also updated 5454 abstracts on the website. Center's books,

both English and Tamil, newsletters and other publications are also available on the website. The Center has completed two bibliography books on Indian Estuaries and Indian Corals in the year 2011-12.

- *ENVIS Center on Environment Education (CEE ENVIS), Ahmedabad*—During year 2011-12, the ENVIS Center on Environment Education catered to the information needs of environmental educators and other interested groups, through various means: i) Green Teacher (url: <http://greenteacher.org>) the website for the CEE ENVIS; ii) query-response service to respond to information requests on any aspect of EE; iii) A quarterly newsletter 'Education for Change' which is also available online on Center's website to disseminate information on EE; iv) EE Bank, a computerized database of concepts, activities, case studies and other resources; v) CEE-Information Service Center (CEE-ISC), a collection of books, periodicals and a variety of non-print materials. Some of these databases are also available on the Green Teacher website. The Center has developed over 400 publications on a range of themes and topics related to Environment Education. The green teacher website holds CEE online catalogue with 37000 entries while there are 234 videos and 35 articles on the thrust areas.
- *ENVIS at CPR Environment Education Center, (CPREEC ENVIS), Chennai*—The thrust of CPREEC ENVIS lies in 8 specific areas, namely, sacred plants, groves, gardens, animals, mountains, rivers, water bodies and precincts of India. Its website (url: <http://cpreecenvis.nic.in>) has received about 32,000 hits in 2011. During the year 2011-12, more than 20 queries have been answered. The April-September 2011 issue of the bi-annual ENVIS Newsletter has been published

and the October 2011-March 2012 issue is under print. The Center is currently in the process of documenting ecological traditions of Madhya Pradesh.

- *Department of Environment, Government of Tamil Nadu, Chennai*—With a thrust area on state of environment and related issues in Tamil Nadu, the ENVIS Center at Department of Environment works for creation of environmental databases of Tamil Nadu state. During the year 2011-12, the Center revamped the biodiversity database to a searchable format and updated the fungal database on its website at url: <http://tnenvis.nic.in>. The Center also brought out three subject-specific Newsletters, a book entitled 'An Identification Field Manual to the Forest Trees of Tamil Nadu' and a student manual in Tamil entitled 'Environment: An Overview' for NGC school students. The ENVIS Center also updated information to the ISBEID database under all modules.
- *ENVIS at Environment Management and Policy Research Institute, (EMPRI ENVIS), Bangalore*— During 2011-12, the EMPRI ENVIS brought out regular newsletters on issues, namely, Conservation of Water Bodies, E-Waste, Climate Change, Rainwater Harvesting, National Green Corps and Eco-Tourism. Implementation of open source library software for cataloguing compiled research media at EMPRI is in progress. Center's website at url: <http://emprienvis.nic.in> hosts data on geophysical profile, demographics and administration of Karnataka. The work on website related to development of concept note for web-enabled spatial database portal for conservation of lakes as well as upgradation of ENVIS site for handling dynamic data related to themes like biodiversity etc. is in progress. The Center also updated the ISBEID database on all 17 modules during 2011-12

which provides access to the information on state of environment and related issues.

- *ENVIS at National Botanical Research Institute (NBRI ENVIS), Lucknow*—During the year 2011-12, NBRI ENVIS published newsletters on Phytoremediation, Nanoparticles and Algal Biofuel for circulation among different stakeholders in India. NBRI ENVIS website (url: <http://nbrienvis.nic.in>) has been redesigned to improve the clarity and ease of access for users.
- *ENVIS at National Institute of Occupational Health, (NIOH ENVIS), Ahmedabad*—Housed at National Institute of Occupational Health, Ahmedabad, NIOH ENVIS Center brings out newsletters and bibliographies in the field of occupational and environmental health. During 2011-12, the Center published Newsletters on Indoor Air Pollution, Musculoskeletal Disorders (MSD); Occupational Accidents and Injuries and Bibliographies on MSD and Accidents and Injuries. A scientific paper on 'Knowledge and attitude regarding mercury handling and disposal in school children' was published in Journal of Waste Management Research. Center's website at url: <http://niohenvis.in> has been redesigned and hosted on NIC domain.
- *ENVIS Center on Hygiene, Sanitation, Sewage Treatment Systems and Technology, (Sulabh ENVIS), New Delhi*—The thrust area of Sulabh ENVIS is Hygiene, Sanitation, and Sewage Treatment Systems and Technologies. Besides regular annual reports, newsletters and query response services, the Center has also published a few books such as Hospital Sanitation and Bio-medical Waste Management: An Integrated Approach and School Sanitation, Hygiene and Health. The Center got recognition

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from Stockholm International Water Institute for its activities during Stockholm Water Prize 2009 at Sweden. The Center's website (url: <http://sulabhenvis.nic.in>) provides information on all environmental sanitation technologies along with those developed by Sulabh.

- *ENVIS at The Energy Resources Institute, (TERI ENVIS), Delhi*—The Center works for identification of information gaps in the renewable energy and environmental sectors. Efforts are also made to bridge these gaps by organizing dissemination activities through journal publishing, query-response services, document-delivery services, capacity-building initiatives and related activities. During 2011-12, the Center brought out TERI Information Digest on Energy and Environment (TIDEE) journal and eNewsletter on Renewable Energy and Environment (eNREE). The Center has also developed different online databases including full-text literature database on the identified subject area and expert directories for users. The TERI ENVIS website at url: <http://terienvis.nic.in> hosts rich collection of value added contents consisting of case studies, technologies, news, events, full-text and abstract databases, directories, GIS maps and other resources.
- *ENVIS at Worldwide Fund for Nature - India, (WWF-India ENVIS), New Delhi*—The ENVIS Center on 'NGOs, Media and Parliament Matters related to Environment' located at WWF-India, New Delhi has developed a database on NGO profiles published in the 9<sup>th</sup> Edition of its Directory of NGOs in India . The Center has also completed the data and analyzed the parliament-related queries and questions for the calendar year, 2010 and 2011 which is available to users. The Center can be accessed online at url: <http://wwfenvis.nic.in>.

- *ENVIS at Zoological Survey of India, (ZSI ENVIS), Kolkata*—ZSI ENVIS is one of the major sources of digital research information on faunal diversity of India. Its data sink is one of the most extensive and authentic sources on the subject to the scientists and researchers in India and abroad. The major activities of ZSI ENVIS during 2011-12 included collection and storage of data on faunal diversity of different Protected Areas (PAs), nature reserves, important wetlands; bibliographic references on Indian animals, endangered and scheduled animals. The ZSI ENVIS has also worked on development of state faunal database and digitization of data on registered material of the National Zoological Collection (NZC). The Center also brought out regular Newsletters and other relevant documents on faunal diversity and their utility. The database and information is available on Center's website at url: <http://zsienvis.nic.in>.

#### **Indian State Level Basic Environmental Information Database (ISBEID)**

In order to develop databases on environment and its related parameters and to make it online for to and fro information flow, a web-enabled software, namely, Indian State Level Basic Environmental Information Database (ISBEID) was developed in collaboration with National Informatics Center (NIC). The objective for development of this software is to cover the gaps in environmental data dissemination with regard to vast parameters such as air pollution, water pollution, forestry, land resources, flora and fauna. Developed in-house, the software consists of 17 modules to help state government centers to collect, compile and disseminate information at state level on the selected modules and fill in the data online in a centralized server.

A management information system (MIS) software module for spatial interface with GIS application in the ISBEID software has been developed by NIC. The major objectives of the software are to (i) develop an internet based GIS application, (ii) provide one-stop information source to the users, (iii) interactive maps capable of handling operations like zoom in/out, pan, print, measure etc. and (iv) querying the database interactively.

Initially the database, consisting of 23 modules in various environmental fields, was tested on pilot basis by eight states with 12 modules in two phases. During the two phases of the programme, it was observed that there were some practical problems in collecting the data and filling the database software. After deliberations it was decided that the existing 23 modules will be revisited and revised in consultation with all the State/UT ENVIS Centers and to extend the ISBEID project for all the States/UTs. Accordingly, the database modules were revised in consultation with the state ENVIS Centers in a workshop organized for this purpose at Hyderabad during 7-8 June, 2010 and finally the number of modules has been reduced to 17. Simultaneously, the ISBEID programme is being extended to all the State/UT ENVIS Centers throughout the country in collaboration with NIC. The database software for the revised 17 modules is complete and has been given to the State/UT ENVIS Centers for entering data in the MIS software. The development of the GIS interface software is in progress.

- A two-day user workshop of ISBEID was organized in collaboration with NIC at New Delhi during 12-13 May, 2011 with all State ENVIS Centers and officials from Ministry, NIC and other experts. The objective of the workshop was to familiarize the ENVIS Centers staff with the use of MIS and GIS modules of ISBEID software. The NIC team

demonstrated how to use the MIS modules, enter the spatial information in the input forms and generate various reports from the ISBEID software database. The team also received the suggestions to improve the interface from the participants. Discussions were also held on various aspects including how to strengthen the ENVIS Scheme.

### State of Environment Reporting (SoER) Scheme

- During the 10<sup>th</sup> Plan period, Ministry launched SoER scheme for which 100% central assistance was provided to the States/UTs to prepare their State of Environment Reports. The scheme for preparation of State of Environment Report with the objective of highlighting the upstream and downstream linkages with environmental issues besides creating a baseline document in the form of SoE Report in each State/UTs continued during the 11<sup>th</sup> Five Year Plan. During the Year 2011-12, the SoE Reports for the states of Andhra Pradesh, Uttar Pradesh and Hyderabad city have been printed. The SoE Reports for the states of Arunachal Pradesh, Karnataka, Tripura, Jammu & Kashmir, Union Territory of Lakshadweep and metro city of Chennai are in progress.

### Statistical Cell

- The role of Statistical Cell in the Ministry *inter alia* includes assistance to different Divisions of the Ministry in providing Statistical inputs and also to liaison with other Central Ministries/ Organizations/ other national and international agencies in the matter of environment and forestry statistics. During the year the Cell provided inputs for various publications of Central Statistical Organizations on environment and forests.
- Environmental Information Division has been representing the Ministry and providing inputs in various Committees of

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the Government, especially those constituted by Ministry of Statistics and Programme Implementation such as 'Development of Database on Climate Change', 'Issues in the Estimation of GDP of Forestry Sector' etc. It also provided necessary information for publication of Compendium of Environmental Statistics, Statistical Abstracts, etc., periodically as per the recommendation of the National Statistical Commission.

- Statistical Advisor has been nominated by the Ministry to act as Nodal Officer for the Development Information System (DevInfo), a database system for monitoring human development. It is a tool for organizing, storing and presenting data in a uniform way to facilitate data sharing at the country, regional and global levels across government departments, UN organizations, civil society organizations and development partners. It is funded by eight UN organizations.

### Information and Facilitation Counter (IFC)

- The Information & Facilitation Counter at Paryavaran Bhawan has been functioning for over 6 years with the assistance of Center for Environment Education, a Center of Excellence supported under this Ministry. The IFC is equipped with a helpdesk, touch screen computer and open display area to guide the visitors.
- IFC continued to disseminate the Ministry's publications such as Annual Reports, Brochures, Journals, Newsletters, Research Guidelines, Awards Guidelines, and Funding Schemes etc. It is also providing guidance regarding application procedure for various schemes of the Ministry along with the information about the status of various applications submitted to the Ministry. The priced publications of the Ministry are available at the IFC.

- IFC also helps in receiving the RTI applications from applicants under the 'in-person' option.

### NGO Cell

A Non-Governmental Organization (NGO) Cell has been set up in the Ministry to handle various matters relating to NGO's working in diverse fields of environment. The basic functions of the Cell are:

- Collection and dissemination of information to various NGOs.
- Liaison with different Ministries/ Departments and other Government agencies on various issues including creating a database relating to NGOs working in the field of environment and its associated areas.'

Besides replying to Parliament Questions/ Assurances, the NGO Cell also disposed of 12 number of RTI applications.

### National/International Conventions/ Meetings/Seminars

EI Division has been actively associated with the Fifth Global Environment Outlook (GEO) Programme of UNEP. The Statistical Advisor attended the following multi-stakeholder Consultations/High-Level Intergovernmental Advisory Panel meetings.

- The Statistical Advisor was nominated by the Ministry of Environment & Forests to attend the Global Intergovernmental and Multi-stakeholder Consultations at Nairobi from 29-31<sup>st</sup> March, 2010. The purpose of the Consultations was to initiate Global Environmental Outlook-5 (GEO-5) process.
- The Statistical Advisor attended the Second High-Level Intergovernmental Advisory Panel at Geneva during 15-17<sup>th</sup> June, 2011. The purpose of the panel was to advise on the key message for inclusion into the Summary of Policy Makers (SPM), a publication of GEO-5 process.



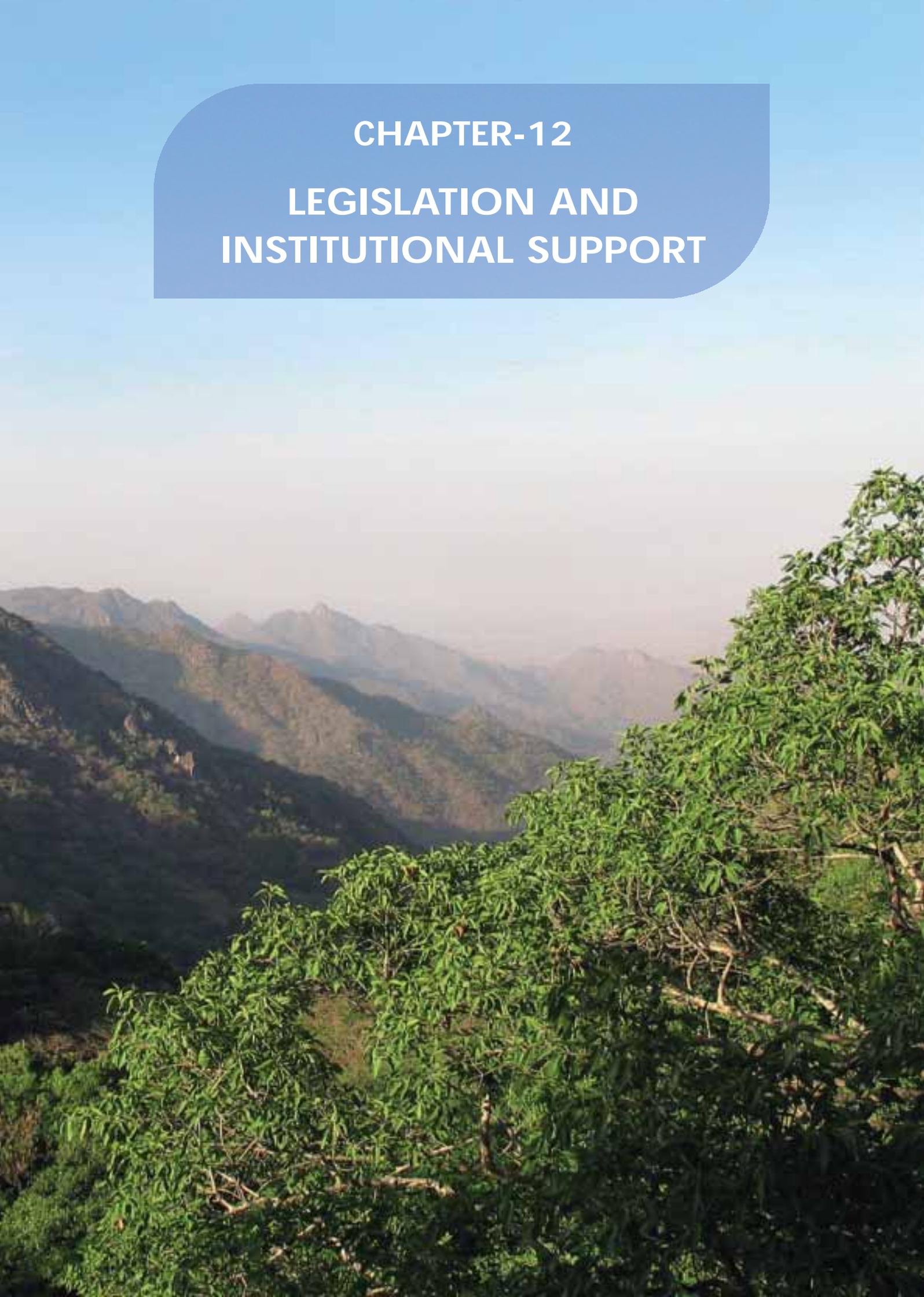
Fig-68. Innauguration of Sub-Regional Capacity-Building Workshop for South Asia on the Clearing House Mechanism from 12-16<sup>th</sup> December, 2011, at Forest Survey of India, Dehradun

- The Statistical Advisor also participated in the Joint Meeting of Coordinating Lead Authors (CLA) of the SPM Drafting Group and the GEO-5 High-Level Intergovernmental Advisory Group organized by UNEP during 28-29<sup>th</sup> November, 2011 at Geneva.
- CBD's Sub-regional Capacity Building Workshop for South Asia on the Clearing-House Mechanism (CHM) was held at Forest Survey of India, Dehradun during 12-16<sup>th</sup> December, 2011. The Workshop was attended by Statistical Advisor Shri Nilkanth Ghosh and Dr. P.S. Rawat Deputy Director among other dignitaries. The purpose of the workshop was to share experience and vision related to the development of national clearing-house mechanism of the participating countries and enable participants to have a good understanding of the situation and challenges in a particular national context. The Advisor presented the environmental information system of India acting as the National CHM. The ENVIS has been designated as National CHM for Bio-diversity on behalf of the MoEF.
- Intergovernmental Meeting on GEO-5 Report of the Summary for Policy Makers was held at Gwangju, Republic of Korea during 28-31<sup>st</sup> January, 2012 to negotiate the document "Summary for Policy Makers" under GEO-5 process. The Statistical Advisor attended the said Meeting.
- SACEP organized "Inception and Training Workshop on Establishment of Environmental Data and Information Management System for South Asia in Colombo, Sri Lanka on 9-10<sup>th</sup> February,

2012. A team of Statistical Advisor and Deputy Secretary (IC) was represented on behalf of the Ministry. A presentation on Environmental Information System of India was given by the Statistical Advisor.

### **Indira Gandhi Paryavaran Puraskar (IGPP)**

- In reverential memory of the late Prime Minister, Smt. Indira Gandhi, The Ministry of Environment and Forests in the year 1987, instituted an award called Indira Gandhi Paryavaran Puraskar (IGPP). As per existing regulations two prizes of Rs.5.0 lakh each under the Organisation category, and three prizes of Rs.5.0 lakh, Rs.3.0 lakh and Rs.2.0 lakh each to individuals in the Individual category are being given annually along with a silver lotus trophy and a citation.
- For IGPP-2009, two awardees under organization category have been selected in the meeting of the Prize Committee under the Chairmanship of Hon'ble Vice President of India held on 29<sup>th</sup> June, 2011. Decision regarding selection of awardees under Individual category is under process. The nominations received for IGPP-2010 have been processed. Short-listing of the nomination is being carried out by the three experts selected by PMO. Advertisements for inviting the nominations for IGPP, 2011 were issued in national dailies with regional coverage on 15<sup>th</sup> July, 2011. The nominations for IGPP-2011 under both the individual and organization category have been received and various activities as per the regulations applicable for IGPP-2011 are under process.

A scenic view of a mountain range with lush green trees in the foreground and a clear blue sky. The mountains are layered, with the closest ones showing more detail and the further ones fading into a light haze. The sky is a clear, bright blue.

# **CHAPTER-12**

## **LEGISLATION AND INSTITUTIONAL SUPPORT**

## Policy and Law

### Introduction

The Policy and Law Division of the Ministry is partly implementing the Schemes “Assistance for Abatement of Pollution, Environment Policy and Law” and “Establishment of Environment Commissions and Tribunals “ and providing legislative and Institutional support to other thematic divisions whenever needed for any amendment to Environment (Protection) Act, 1986 or implementation of the National Environment Policy 2006, National Green Tribunal Act, 2010, Ecomark Scheme and work relating to setting up of National Environment Assessment and Monitoring Authority (NEAMA).

### The National Green Tribunal Act, 2010

The National Green Tribunal (NGT) has been established under the National Green Tribunal Act, 2010 on 18<sup>th</sup> 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 shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.

The Tribunal's dedicated jurisdiction in environmental matters shall provide speedy environmental justice and help reduce the burden of litigation in the higher Courts. The Tribunal is mandated to make an endeavor

for disposal of applications or appeals finally within six months of filing of the same. The NGT is proposed to have five places of sitting and will follow circuit procedure for making itself more accessible. New Delhi is the Principal place of sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai are the other places of sitting of the Tribunal.

Presently, the NGT is operating from its temporary office at Van Vigyan Bhawan, R.K. Puram, New Delhi and Bhikaji Cama Place, Trikoot House, Ring Road, New Delhi. The Tribunal has commenced its hearings from July, 2011. The applicants can file applications/ petitions before the Tribunal at Delhi till other benches of the Tribunal become functional. The first hearing of the Circuit Court at Bhopal was held on 17<sup>th</sup> November, 2011, 10<sup>th</sup> February, 2011, 17<sup>th</sup> February, 2011 and 24<sup>th</sup> February, 2011, respectively.

At present, the Tribunal consists of a Chairperson and four Expert Members and two Judicial Members. The Expert Members are experts in physical and life sciences, engineering and law including persons having practical knowledge and administrative experience in the field of environment policy and regulation. NGT Act, 2010 provides for a minimum of 10 Expert Members and equal Judicial Members. The Ministry is in the process of filling up the remaining vacancies of Members in the Tribunal.

NGT has been a landmark achievement of the Government in the field of environment adjudication.

### National Environment Assessment and Monitoring Authority (NEAMA)

The Ministry has taken active steps to establish a National Environment Assessment and Monitoring Authority (NEAMA) earlier envisaged as National Environment Protection Authority (NEPA) with a view 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.

Indian Institute of Technology (IIT), Delhi was awarded a consultancy by the Ministry to prepare a project report on the establishment of NEPA. Following the recommendation in the report of IIT, Delhi on the project titled "Scope Structure and Processes of NEAMA", a discussion paper on "Reforms in Environmental Governance with special reference to establishment of NEAMA" was uploaded on MOEF's website on 26<sup>th</sup> November, 2010 for comments. The final report of IIT, Delhi has also been uploaded on the Ministry's website.

When established, NEAMA would be a part of the larger environmental regulatory reform agenda which the Ministry proposes to undertake which shall, inter alia include innovative systems of environmental regulation.

## Trade and Environment

### Trade and Environment Cell

Trade and Environment (T&E) Cell of the Ministry undertakes the following items of work :

- Provide technical inputs to the preparatory process in the area of Trade and Environment.
- Formulation of MoEF's views on trade related matters referred to the Ministry by other Ministries including views on issues relating to Regional/Bilateral/Multilateral Trade Agreements and other trade related issues.
- Act as nodal division within the Ministry to deal with references received from the Ministry of Commerce and Industry.

- Implementation of the ongoing Project on Trade and Environment.
- To act as export promotion cell in the Ministry.

### Activities undertaken during the year

During the year 2011-12, the Trade and Environment Cell of the Ministry examined and furnished inputs to the Department of Commerce (DoC) on the environment and forestry point of view for facilitating participation in the ongoing negotiation under World Trade Organization (WTO). Inputs regarding in the area of the Environmental Goods and Services were also provided as and when required by the Department of Commerce (DoC). In addition to the above, T&E Cell examined a number of Regional Trade Agreements (RTA), Bilateral Investment Protection Agreements or Investments Treaties, Comprehensive Economic Cooperation Agreements (CECA) and Free Trade Agreements (FTA) from the environment and forestry point of view. Agreements from Israel, Belarus, China, Finland and Russia etc were examined and comments furnished. Inputs to the DoC were also provided on REACH as a Non-Tariff Barrier on chemicals by European Union and China. Inputs/Background Note was also provided to DoC on International Maritime Organization (IMO) Negotiations on Market Based Measures (MBMs) to control Green House Gas Emissions from ships. Information/Inputs were also provided to the Department of Industrial Policy and Promotion on issues related to the Intellectual Property Rights (IPRs), Transfer of Technology etc. Prepared detailed information on behalf of MoEF to the Department of Commerce for recently concluded India's Fifth Trade Policy Review (TPR) at the WTO Secretariat, Geneva. As a follow up action to TPR, questionnaires/clarifications by various countries were replied

to under strict time limits. Proposals for opening up of liaisoning offices in India by developed countries were also processed. Proposals for ongoing India EFTA (Iceland, Norway, Switzerland) Negotiation in Trade and Investment Agreement are also being examined in the Ministry.

The consultancy project, 'Programme on Trade and Environment' continued during the year. The dedicated website – [http: / www.mse.ac.in/Trade/index.asp](http://www.mse.ac.in/Trade/index.asp) – functions as one-stop resource for Trade and Environment related issues in India with comprehensive coverage of Regional Trade Agreement,

Comprehensive Economic Cooperation Agreements, Free Trade Agreements and Trade & Environment Issues of WTO.

### **Budget allocation of the scheme during the year and progress of expenditure**

The budget allocation for the Trade and Environment Cell for the Financial Year is Rs.14 lakhs, out of which Rs.5,54,455/- was sanctioned to Madras School of Economics (MSE), Chennai on 4<sup>th</sup> March, 2011. Further, Rs.6,60,409/- was also sanctioned to MSE on 27<sup>th</sup> September, 2011.

# CHAPTER-13

## SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE



## Sustainable Development Division

Sustainable Development is one of the thrust areas of the Ministry of Environment and Forests and International Cooperation and Sustainable Development Division (IC&SD) is responsible for interacting with the various UN Agencies, International Bodies and foreign countries for the cause of developing concerns of sustainable development in the various national programmes and policies. IC&SD is the nodal point within Ministry to co-ordinate all International Environmental Cooperation and Sustainable Development issues.

The United Nations Conference on Environment and Development (UNCED), also known as Earth Summit or Rio Summit, was held at Rio-de-Janeiro, Brazil in 1992, had adopted the Agenda 21, which is a blue print for a global plan of action for achieving sustainable development. The Commission on Sustainable Development (CSD) was set up in 1993 under United Nations Economic and Social Council (UN ECOSOC) for the purpose of review of progress of implementation of the Agenda 21. The Commission meets annually in New York, USA.

The major activities taken up during the year 2011-12 is summarized as under:

### Delhi Ministerial Dialogue held on 3<sup>rd</sup>-4<sup>th</sup> October, 2011

- The Ministry organized the Delhi Ministerial Dialogue on 3<sup>rd</sup>-4<sup>th</sup> October, 2011 at Hotel 'The Ashok', New Delhi.
- The representatives of around 41 countries (including India) and 9 UN and other important organizations participated in the meeting
- The title of the Dialogue was 'Green Economy & Inclusive Growth. The focus of the Dialogue was on integrating green economy architecture and poverty eradication, food security and energy security.
- All the relevant documents including

Chair's Summary are available on MoEF Website.

## International Events

- **United Nations Conference on Sustainable Development (Rio+20), in August, 2011 at Itamaraty Palace, in Rio de Janeiro**

Indian Delegation consisting of officers of this Ministry and Ministry of External Affairs attended the Informal Consultation Meeting concerning the topics of the UNCED on 21<sup>st</sup> August and BASIC meeting on 24<sup>th</sup>-25<sup>th</sup> August, 2011.

- **High Level Conference Sharing Green Economy based practices towards Rio+20, Warsaw, Poland**

Indian Delegation consisting of officers of this Ministry and Ministry of External Affairs attended the High Level Conference titled "Sharing Green Economy based practices towards Rio+20" held in Warsaw, Poland on 11<sup>th</sup>-12<sup>th</sup> October, 2011.

- **Asia Pacific Preparatory Meeting for the UNCED, Seoul, Republic of Korea**

Indian Delegation consisting of officers of this Ministry and Ministry of External Affairs attended the Asia Pacific Preparatory Meeting for the UNCED held in Seoul, Republic of Korea from 19<sup>th</sup>-20<sup>th</sup> October, 2011.

- **Second Inter-sessional Meeting of the United Nations Conference on Sustainable Development (UNCSD), New York, USA**

Indian Delegation consisting of officers of this Ministry and Ministry of External Affairs attended the 2<sup>nd</sup> Inter-sessional Meeting of The United Nations Conference on Sustainable Development (UNCSD) was held on 15<sup>th</sup>-16<sup>th</sup> December, 2011 in New York, USA.

- **The United Nations Conference on Sustainable Development (UNCSD), or Rio+20, will take place in Rio de Janeiro, Brazil, in June, 2012 to commensurate the completion of twenty years of 1992 Earth Summit.**

### **Publication on “Sustainable Development in India: stocktaking in the run up to Rio+20”**

A publication on “Sustainable Development in India: Stocktaking in the run up to Rio+20” was released on 3<sup>rd</sup> October, 2011 by Hon’ble Minister of Environment and Forests during Delhi Ministerial Dialogue. As the global community prepares for the United Nations Conference on Sustainable Development (UNCSD), also popularly known as the Rio+20 that will be held in Rio de Janeiro in 2012, taking stock of national initiatives in addressing sustainability concerns is important. With this rationale, the Ministry of Environment and Forests (MoEF), Government of India undertook a study to track key initiatives in India towards the promotion of sustainable development in the years following the 1992 United Nations Conference on Environment and Development (UNCED). The book discusses key policies, programmes, legal, financial provisioning, institutional mechanisms, and engagement with major groups that contribute to the objective of sustainable development. The document also assesses gaps and challenges faced by India as a developing country.

### **Submission of India’s National Inputs for Rio+20**

The UNCSD/Rio+20 to be held at Rio de Janeiro in June 2012 have two themes viz., Green Economy in the context of Sustainable Development & Poverty Eradication (GESDPE) and Institutional Framework for Sustainable Development (IFSD). Member states of UN were required to submit their National Inputs to Secretariat

of UNCSD on or before 1<sup>st</sup> November, 2011. Accordingly, India has submitted its National Inputs to UNCSD, which are available on ‘www.uncsd2012.org’ website along with inputs of other countries as well.

### **Delhi Sustainable Development Summit (DSDS)**

The 2012 edition of DSDS has been scheduled on 2-4 February, with the “Protecting the global commons: 20 years post Rio”. Industry leaders, opinion makers, and climate change experts will gather to create a uniform level of understanding among all stakeholders and formulate meaningful policy options for a constructive dialogue on climate change and try to arrive at an agreement.

### **Commission on Sustainable Development (CSD)**

The 19<sup>th</sup> Session of the UN Commission on Sustainable Development (CSD-19) was held at the UN Headquarters in New York from 2<sup>nd</sup>-13<sup>th</sup> May, 2011. The Commission on Sustainable Development was created as an outcome of the Rio Earth Summit in 1992, and its mandate reaffirmed and expanded in the 2002 Johannesburg Plan of Implementation. In its eleventh session, it was decided that the CSD’s multi-year programme of work beyond 2003 would be organized on the basis of seven two-year cycles, with each cycle focusing on selected thematic clusters of issues. CSD-19 was the final year of the 4<sup>th</sup> cycle, and its thematic focus areas were transport, mining, chemicals, waste management, and a 10 year framework of programmes on sustainable consumption and production patterns. Inter-linkages and cross cutting issues were also on the agenda. Indian Delegation headed by Secretary (E&F) comprising of officers from Ministry of Environment and Forests & Ministry of External Affairs participated in the meeting. There was no agreed outcome at CSD-19 because of logjam over issues like human right in occupied territories and means of implementation.

### International Centre for Integrated Mountain Development (ICIMOD)

The interaction and collaboration between ICIMOD and the Government of India and among the national partners took place through the Strategic Programmes and Action Areas of ICIMOD, being within the ambit of the Memorandum of Understanding (MOU) signed by the GBPIHED, on behalf of the Ministry of Environment and Forests, Government of India, with ICIMOD, Kathmandu, on the 25<sup>th</sup> September, 2008. The major highlight of 2011 collaboration was the organization of 'India ICIMOD Day' on 30<sup>th</sup> September, 2011 at New Delhi, which acted as a boost by providing an opportunity for the eminent experts, G.B.Pant Institute of Himalayan Environment and Development (GBPIHED) and other partner Institutions and ICIMOD professionals to interact and share their experiences. Hon'ble Minister of State (I/C) for Environment and Forests, Government of India inaugurated the day's program and Hon'ble Minister for Science and Technology, Government of India presided over the function. Both the Ministers provided directions & set priorities for future collaboration. ICIMOD participated in celebrating World Environment Day with the theme: '*Forests: Nature at Your Service*'. A regional event in celebration of World Environment Day, '*Voices of School Children – Children's Discussion and Expression Sessions*' was organised by ICIMOD in partnership with the GB Pant Institute of Himalayan Environment and Development (GBPIHED) on 5<sup>th</sup> June, 2011. School children from mountain areas in different age groups were brought together to discuss on various mountain issues.

Other major programs include developing entrepreneurship in value-chains of *Cinnamomum tamala* (Indian Bay Leaf); linking poor producers to markets for essential oils and spices which is completed. Efforts are being made to obtain support for co-

management of rangeland activities in Ladakh, through Chang Tang Foundation. ICIMOD with its partners in India and other countries operationalized a landscape management project in Kailash Sacred Landscape area. Expert consultations and Yatras are organized in India and Nepal under the planning phase of the project. Other initiatives in the landscape conservation efforts include Namdapha National Park (Tiger Reserve), Mouling National Park and the surrounding areas in Arunachal Pradesh and Brahmaputra-Salween Landscape. For learning from developments in other parts of the globe, a river basins twinning project was initiated. It comprised of dissemination of results of the case studies conducted in the Upper Danube and Upper Brahmaputra river basins.

### United Nations Convention to Combat Desertification

#### Brief Objectives

- The objective of the division is twofold:
- To implement policies and promote policy initiatives related to minimize land degradation in dryland areas.
  - To facilitate planning and implementation of programmes and projects to address desertification, land degradation and drought (DLDD) in the dryland areas, specially through sustainable land & ecosystem management (SLEM).

#### Activities undertaken so far

##### Policy Initiatives

- A 3-member delegation led by Joint Secretary, MoEF (and National Focal Point for UNCCD) and comprising of Science and Technology Correspondent and Programme Director – SLEM programme attended the UNCCD COP 10 meeting from 10<sup>th</sup>-21<sup>st</sup> October at Changwon, Republic of Korea.
- On 20<sup>th</sup> September, 2011, a one-day high-level meeting on the theme

“Addressing desertification, land degradation and drought in the context of sustainable development and poverty eradication” was held and statement by India was delivered by Mr. Dilip Sinha, Additional Secretary, at the 66th session of the United Nations General Assembly.

- Meeting of the Asia-Pacific (Annex II) was held in Bali Indonesia, September 2011 to firm up the regional position in preparation for COP 10.
- Preparatory meeting to the COP 10 at the national level was held on 22<sup>nd</sup> September, 2011 to firm India's position.
- Director and Science and Technology Correspondent for India attended “Experts meeting on combating desertification in Asia” at Ulaanbaatar, Mongolia from 6<sup>th</sup>-7<sup>th</sup> September, 2011.

#### Programme Initiatives

- Proposal submitted on “Enhancing capacity for alignment of National Action Programme to 10 year Strategy of UNCCD & for National Reporting to UNCCD Secretariat” for funding to GEF secretariat under cycle 5.

#### Progress/achievements made during the year

The following were important milestones achieved:

- The 4<sup>th</sup> National Report was submitted to the UNCCD secretariat on-line on 26<sup>th</sup> October, 2010 using the Performance Review and Assessment of Implementation System (PRAIS). The Elucidation report was printed and disseminated widely, including UNCCD COP 10 at Republic of Korea in October 2011. The final submitted report is available on the ministry website and can be downloaded at <http://moef.nic.in/modules/divisions/desertification-cell/?f=report2010>
- A 3 member delegation led by Joint Secretary, MoEF (and National Focal

Point for UNCCD) and comprising of Science and Technology Correspondent and Programme Director- SLEM programme attended the UNCCD COP 10 meeting from 10<sup>th</sup>-21<sup>st</sup> October at Changwon, Republic of Korea.

- A Brainstorming workshop on “Desertification Mapping and Reporting on Impact Indicators” on 27<sup>th</sup> July, 2011 with a focus on harmonisation of data using existing assessment tools for reporting on the Impact Indicators and strengthening the proposal for GEF 5.
- The National Steering Committee for the Sustainable Land and Ecosystem Management (SLEM) programme was constituted on 31<sup>st</sup> March, 2010 with the mandate to endorse the work plans of the SLEM projects and review progress. Accordingly, the first NSC meeting was held on 26<sup>th</sup> May, 2010 and the second meeting was held on 19<sup>th</sup> April, 2011.
- World Day to Combat Desertification on 17<sup>th</sup> June, 2011 was observed and a workshop was organized at Indian Council of Forestry Research and Education, Dehradun, Uttarakhand. The workshop was inaugurated by Padma Bhushan Shri Chandi Prasad Bhatt and Dr. R.V. Singh Former DG, Indian Council of Forestry Research and Education was the Guest of Honour. The UNCCD theme for this year, the workshop theme was “SLEM: Role of Forest in Dryland Areas”.

#### Comparison of progress

- Brainstorming workshop on Desertification mapping and on Impact Indicators was organized on 27<sup>th</sup> July, 2011 in preparation for Reporting on Impact Indicators in 2012.
- A three (3) member Delegation lead by Joint Secretary, MoEF attended the UNCCD COP 10 from 10<sup>th</sup> to 21<sup>st</sup> October, 2011 at Changwon, Republic of Korea.

## Regulatory Acts/Rules governing the programme and promulgation of new Acts

- The United Nations Convention to Combat Desertification (UNCCD) is one of the three Rio Conventions that focuses on Desertification, Land Degradation and Drought (DLDD). 'Desertification' as defined in the UNCCD refers to land degradation in the drylands (arid, semi arid and dry sub humid regions) resulting from various factors and *does not* connote spread or expansion of deserts.
- UNCCD with 194 Parties recognizes land degradation as an important factor affecting some of the most vulnerable people and ecosystems in the world. The convention aims at adaption and can, on implementation, significantly contribute to achieving the Millennium Development Goals (MDGs), as well as sustainable development and poverty reduction by means of arresting and reversing land degradation.
- The convention promotes Sustainable Land Management (SLM) as solution to global challenges. Land degradation is long-term loss of ecosystem function and productivity caused by disturbances from which the land cannot recover unaided. While Sustainable Land Management is focused on changes in land cover/land use in order to maintain and enhance ecosystems functions and services.
- As the Convention enters its second decade, the Parties unanimously adopted the 10-year strategic plan and framework to enhance the implementation of the Convention for 2008-2018 (The Strategy) at COPS, held in Madrid in September 2007. The Strategy provides a unique opportunity to address some of the Convention's key challenges, to capitalize on its strengths, to seize opportunities provided by the new policy and financing environment, and to create a new, revitalized common ground for all UNCCD stakeholders. The Strategy contains the "strategic objectives" to be achieved over the 10 years, and the "operational objectives" that guide the actions of short and medium-term effects. The strategy can be downloaded at <http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/The%20Strategy%20leaflet-english.pdf>
- India became a signatory to the United Nations Convention to Combat Desertification on 14<sup>th</sup> October, 1994 and ratified it on 17<sup>th</sup> December, 1996. With about 32% of its land being affected by land degradation, India has high stakes and stands strongly committed to implementing the UNCCD. The Ministry of Environment and Forests is the nodal Ministry in the Government of India for the UNCCD, and Desertification cell is the nodal point within the Ministry to coordinate all issues pertaining to the convention. Additionally, India is also the Chair of the Asia Group of countries party to UNCCD.
- Though India does not have a specific policy or legislative framework for combating desertification as such, the concern for arresting and reversing land degradation and desertification gets reflected in many of our national policies which have enabling provisions for addressing these problems. It is also implicit in the goals of Sustainable Forest Management (SFM), sustainable agriculture, Sustainable Land Management (SLM) and the overarching goal of sustainable development which the country has been pursuing. The subject has in fact been engaging the attention of our planners and policy makers since the inception of planning. The first five year plan (1951-1956) had 'land rehabilitation' as one of the thrust

- areas. In the subsequent plans too, high priority has been consistently attached to development of the drylands.
- As per the Desertification and Land Degradation Atlas of India published by the Space Application Centre in 2007 about 32.07% of the land is undergoing various forms of degradation and 25% of the geographical area is affected by desertification. About 69% of the country's lands are drylands and degradation of these lands has severe implications for the livelihood and food security of millions.
- It is worth noting that India occupies only 2.4% of the world's geographical area, yet supports about 16.7% of the world's human population; it has only 0.5% of the world's grazing land but supports 18% of the world's cattle population. Thus there is tremendous pressure on our land-based natural resources, and sustainable land management is crucial for sustainable development and also our progress towards attaining the MDG goals including poverty alleviation.
- India formulated and submitted in 2001 a National Action Programme (NAP) to combat desertification, in accordance with the Convention (UNCCD). A broad roadmap to combating desertification, NAP recognizes the multi-sectoral nature of the task, in view of the fact that many of the drivers of desertification have cross cutting dimensions. As for instance, poverty of the masses has long been known to be a key driver of desertification and land degradation, which needs to be addressed.
- To address the issues of DLDD and build synergy with other RIO conventions (UNFCCC & CBD), the Sustainable Land and Ecosystem Management Country Partnership Program (SLEM CPP) was developed. The SLEM Programme is a joint initiative between the Government of India (GOI) and the Global

Environmental Facility (GEF), under the latter's Country Partnership Programme (CPP). The objective of SLEM Programmatic Approach is to "promote sustainable land management and use of biodiversity as well as maintain the capacity of ecosystems to deliver goods and services". Under this SLEM Programmatic Approach, seven projects have been formulated, and are under various stages of implementation.

## Climate Change

### Introduction

Climate change is a global phenomenon but adversely affects developing countries particularly as their capacity and resources to deal with the challenge is limited. India is already vulnerable to a large degree of climate variability. Studies indicate that climate change may exacerbate the problem of existing climate variability in India. It is projected that, by the end of 21<sup>st</sup> century, rainfall in India may increase by 15-40% with high regional variability. Warming may be more pronounced over land areas with northern India experiencing maximum increase. The warming could be relatively greater in winter and post-monsoon seasons. The annual mean temperature could increase by 3°C to 6°C over the century.

The likely impacts of climate change on different regions and sectors have been studied and assessed from time to time. Initial assessments were carried out in National Communications in 2004. Recently, this Ministry carried out a major assessment for four sectors – water resources, agriculture, forests and human health – in four critical regions of India – the Himalayan region, North-East, Western Ghats and coastal prepared by INCCA. The report 'Climate Change and India: 4x4 assessment' provides a comprehensive, long-term assessment of impact of climate change in 2030s. The assessment will be further deepened and

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refined through a comprehensive exercise of preparation of National Communications (NATCOM) that is due in 2012.

### International regime for climate change

A consensus-based international regime for addressing climate change exists in form of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Kyoto Protocol of the Convention sets legally binding targets for GHG reductions by industrialized countries (5.2% below their aggregate 1990 emissions) during the “first commitment period”, 2008-2012. The Convention is premised on the principle of “common but differentiated responsibilities and respective capabilities” and recognizes the responsibilities of developed countries in reducing the global emissions of greenhouse gases. The implementation of the Convention is reviewed by the Conference of Parties (CoP) at its annual meetings.

Currently, the international community is engaged in negotiating and implementing enhanced actions for achieving the objectives of the Convention and its Kyoto Protocol, under a mandate known as the Bali Road Map, in accordance with which the parties have taken certain decisions at Cancun in 2010 and in Durban in 2011.

### Durban Outcomes at CoP-17

The seventeenth Conference of Parties (COP-17) to UNFCCC held at Durban during 28<sup>th</sup> November – 9<sup>th</sup> December, 2011 took several important decisions on the issues under negotiations. The Indian delegation that participated in the Conference was led by Smt. Jayanthi Natarajan, Minister of Environment & Forests (I/C). India played an important role in reaching the agreements at Durban.



Fig-69. Indian delegates lead by Smt. Jayanthi Natarajan, Minister of Environment and Forests (I/C)

Durban outcomes are notable as the second commitment period of the Kyoto Protocol was established and some of the key agreements related to Green Climate Fund, Technology Mechanism and the Adaptation Framework were operationalized. The transparency arrangements agreed at Cancun were also finalized with the adoption of MRV guidelines for both the developed and developing countries. It was ensured that the guidelines for the developing countries are not more onerous than for the developed countries.

Durban outcomes also opened a window for discussions on the post-2020 arrangements for addressing global climate change for which a Durban Platform has been launched. India took lead in ensuring that the new arrangements are created under the Convention so that the principles of Equity and Common But Differentiated Responsibilities fully apply to the arrangements. Durban Platform will explore options for a range of actions that can close the ambition gap in accordance with these principles.

Though the Durban decisions are a significant step forward, there are other concerns of developing countries which are yet to be fully addressed. The foremost issue is that of equitable burden sharing with regard to mitigation actions between the developing and developed countries in the post 2020



Fig-70. Smt. Jayanthi Natarajan (MEF) in discussion with other delegates

arrangements. This is necessary to ensure that the goal of social and economic development and poverty eradication in developing countries is not compromised. Besides the issues of unilateral measures and technology related intellectual property rights (IPRs) continue to be the dominant concern in the run up to Doha.

In the ensuing negotiations, urgent work is needed on (i) defining equity making it, together with the CBDR, the bed rock of post-2020 arrangements, (ii) implementing the decision on the second commitment period under the Kyoto Protocol (KP) and strengthening the Clean Development Mechanism (CDM), (iii) ensuring comparability of targets between Kyoto Protocol and Non-Kyoto Protocol parties, (iv) preventing unilateral trade actions in the name of climate change, (v) initiating a dialogue on Intellectual Property Rights as part of technology development and transfer efforts, and (vi) capitalizing the Green Climate Fund and raising resources in the long run.

### Climate change and India's actions

Although India's contribution to global climate change is minimal and its total CO<sub>2</sub>

emissions are about 4% only of total global CO<sub>2</sub> emissions, India has been conscious of the global challenge of climate change. In fulfillment of the international obligations under the UNFCCC, India prepares a National Communication (NATCOM) which gives an inventory of the greenhouse gases (GHG) emissions in India, and assesses the vulnerability and impacts. First NATCOM was presented in 2004. The Government is engaged in preparing NATCOM II, which will be presented to the UNFCCC in 2012. Preparation of NATCOM II is an exercise

based on an extensive network of research and scientific institutions in India and draws upon expertise and assistance from different institutions.

Steps have also been taken to increase capacity at the institutional level for conducting research into climate change science and making necessary assessments. The Ministry has set up a network, namely the Indian Network for Climate Change Assessment (INCCA) comprising of 127 research institutions tasked with undertaking research on the science of climate change and its impacts on different sectors of economy across various regions of India. The Ministry released, in May 2010, India's Green House Gas (GHG) Emissions Inventory for 2007 prepared by INCCA. The 2007 inventory was brought out in order to increase transparency of estimates of the GHG emissions in India. With this publication, India became the first 'non Annex I' (i.e., developing) country to publish such updated numbers. This constitutes a major step forward to improving the frequency of the preparation of NATCOMs and emissions inventory in India.

India's strategy for addressing climate change is also reflected in many of its social

and economic development programmes. The National Action Plan on Climate Change (NAPCC) coordinated by the Ministry of Environment & Forests is being implemented through the Nodal Ministries in specific sectors/areas. Eight national missions in the area of solar energy, enhanced energy efficiency, sustainable agriculture, sustainable habitat, water, Himalayan eco-system, increasing the forest cover and strategic knowledge for climate change form the core of National Action Plan. All national missions have been approved by the Prime Minister's Council on Climate Change and are at different stages of implementation. State Governments are also preparing, under advice of the Central Government, State Action Plans on Climate Change aimed at creating institutional and programme oriented capacities to address climate change.

Government has announced a domestic mitigation goal of reducing emissions intensity of GDP by 20-25% by 2020 in comparison with 2005 level. This is in line with the projections of the energy intensity of India's output that has shown a declining trend owing to improvements in energy efficiency, autonomous technological changes and economical use of energy. This domestic goal and the objectives of the National Action Plan on Climate Change are proposed to be achieved through a sustainable development strategy that will be outlined in course of the XII<sup>th</sup> Five Year Plan.

### Initiatives taken in 2011-12

Besides following a pro-active policy of domestic actions, India took several other initiatives during the year to advance domestic and international actions on climate change.

At the initiative of the Ministry, Planning Commission has recognized climate change as a major area of environmental intervention. 'Climate Change Action Programme', a new thematic/umbrella Scheme has been approved by the Planning Commission for inclusion in

the 12<sup>th</sup> Five year Plan. To be launched from the year 2012-13, the new scheme aims at advancing scientific research into and assessment of the phenomenon of climate change, building an institutional and analytical capacity for research and studies in the area of climate change, and supporting domestic actions to address climate change through specific programmes and actions at the national and state level. The activities under the Scheme will continue to be amplified and developed in later years.

In 2011, Ministry launched an ambitious project on assessment of 'black carbon' and its impact on environment in consultation with other agencies of the Government. The project has been launched with support of Indian Space Research Organization (ISRO).

India's participation in CDM projects continued to see an upward trend during the year. By the end of 2011, the total number of approved projects in India had risen to 2160 out of which 776 had been registered by the CDM Executive Board (EB) of the UNFCCC. The total investment potential of the approved projects is Rs.3,64,034 crores. The Certified Emission Reduction certificates (CERs) for the projects approved by the EB are 124 million. At a nominal value of US \$ 10 per CER, this represents a likely flow of around US \$ 1,240 million. India continues to occupy the second position globally in terms of projects approved by the EB as also in terms of the value of CERs earned by the approved projects.

Sixteen State Governments and Governments of Union Territories have prepared State Action Plans on Climate Change (SAPCC) in accordance with the template prepared by the Central Government. A Steering Committee at the Central level will examine the Plans following which the modalities for financing and implementing the SAPCCs will be considered in the 12<sup>th</sup> Five Year Plan.



Fig-71. Alpine meadow in Western Himalaya

India hosted the sixth BASIC Ministers meeting on 26<sup>th</sup>-27<sup>th</sup> January, 2011 in New Delhi during which the Environment Ministers of India, Brazil, China and South Africa met to discuss the climate change issues in the run up to the seventeenth Conference of Parties. In line with the BASIC plus approach, Ministers from Algeria, Maldives and Chair of the Group of 77 & China were also invited to the meeting. India attended the BASIC meetings hosted by South Africa in Zimbali (28<sup>th</sup>-29<sup>th</sup> May, 2011), Brazil in Inhotim (26<sup>th</sup>-27<sup>th</sup> August, 2011), and China in Beijing (31<sup>st</sup> October -1<sup>st</sup> November, 2011). India also participated in the meetings of Major Economies Forum organized by the US and Petersberg Dialogue on climate change organized by Germany.

The Ministry held bilateral dialogues with several countries on climate change related issues. An India-USA bilateral climate dialogue has hosted by India on 18<sup>th</sup> July,

2011 in New Delhi during which the bilateral and multilateral issues related to climate change were discussed. Bilateral discussions with European Union were held ahead of India-EU Summit in 2012. During these meetings, the issues of EU's decision to include aviation in its Emissions Trading Scheme and the Joint Work Programme on Energy, Clean Development and Climate Change were discussed. India also held bilateral meetings including a stakeholder's meeting in New Delhi in September 2011 to discuss the Bilateral Credit Mechanism proposed by Japan.

During the year, India joined the World Bank's Partnership for Market Readiness (PMR), with a view to take forward market related initiatives in the field of mitigation and to provide capacity building to developing countries in creating enabling environment for domestic carbon markets. India's investment Plan for Clean Technology Fund (CTF) for

accessing the resources of Clean Technology Fund was also cleared by the World Bank.

At the sub-regional level, India partnered with Bhutan, Nepal and Bangladesh for cooperation to address adverse effects of climate change through adaptation actions in the four thematic areas of Food, Water, Energy and Biodiversity. This initiative culminated in a Minister level Bhutan Climate Summit held on November 19, 2011.

**Some other schemes under Climate Change areas are as follows:**

- India's National Communication to United Nations Framework Convention on Climate Change (UNFCCC)
- Climate Change Science Programme
- Inter Governmental Panel on Climate Change (IPCC)

**Brief Objectives**

- To meet the obligations under Article 12 of UNFCCC
- To conduct studies to assess the impact of climate change
- To prepare scientific assessments related to climate change at global level

Under the aegis of Indian Network for Climate Change Assessment (INCCA), three new scientific programmes, namely, National Carbonaceous Aerosols Programme (NCAP), Long-term ecological observatories, Centre for Advanced Studies in North East Regions of India have been initiated by this Ministry.

**India's National Communication to United Nations Framework Convention on Climate Change (UNFCCC)**

India is a Party to the United Nations Framework Convention on Climate Change (UNFCCC), the objective of which is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the

climate system. The Convention enjoins Parties is to communicate information about the implementation of the Convention, taking into account the common but differentiated responsibilities and respective capabilities and their specific regional and national development priorities, objectives and circumstances. Article 12 of the Convention relates to the communication of information pertaining to implementation in accordance with Article 4 (1) of the Convention, whereby each Party is required to communicate to the Conference of the Parties. The elements of information in the communication are provided in the context of national circumstances and include:

- A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of Parties;
- A general description of steps taken to implement the Convention including an assessment of impacts, vulnerability due to climate change and associated adaptation needs, and
- Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

Towards fulfilment of obligation under the UNFCCC, India submitted its Initial National Communication to the UNFCCC Secretariat in June 2004, within three years of receipt of financial support from the Global Environment Facility (GEF). The second National Communication has been prepared in association with a wide range of institutions covering research organizations, universities,

industry associations and non-governmental organizations spread all over India and the relevant ministries and their departments. The Document is now in the process of approval for submission to the UNFCCC for the next Conference of Parties. The Ministry of Environment & Forests is both executing and the implementing agency. The UNDP, New Delhi is the GEF implementing agency.

### Indian Network of Climate Change Assessment (INCCA)

With a view to enhance knowledge about the impacts of climate change at the national and sub-national level, Indian Network of Climate Change Assessment (INCCA) on October 14, 2009 has been launched. INCCA has been conceptualized as a network-based scientific programme designed to (a) Assess the drivers and implications of climate change through scientific research; (b) Prepare climate change assessments once every two years (greenhouse gas estimations and impact of climate change, associated vulnerabilities and adaptation); (c) Develop decision support systems and (d) Build capacity towards management of climate-change related risks and opportunities. The programmes envisaged under INCCA can diagrammatically be shown in Fig-72.

### Black Carbon Research Initiative: National Carbonaceous Aerosols Programme

Aerosol is a system of colloidal particles dispersed in the atmospheric gases. It may be of natural or anthropogenic origin. It may have influence on climate directly through scattering and absorbing radiation, and indirectly through acting as cloud condensation nuclei or modifying the optical properties and lifetime of clouds.

In India, systematic investigations of the physical

and chemical properties of aerosols, their temporal heterogeneities, spectral characteristics and size distribution have been carried out extensively since the 1980s at different distinct geographical regions as part of different national programmes such as the I-MAP (Indian Middle Atmosphere Programme), and later under the ISRO-GBP (Indian Space Research Organization's Geosphere Biosphere Programme). The ISRO-GBP annual review meeting in 1998 recognized the importance of Black Carbon aerosols on the climate system and it was decided to pursue studies of Black Carbon in subsequent years.

In view of this, a multi-institutional and multi-agency Science Plan has been launched in this Ministry in association with Ministry of Earth Sciences, Indian Space Research Organization, Ministry of Science and Technology and other associated agencies, to monitor aerosols and assess its impacts through various modeling techniques.

### Ecosystem Monitoring: Network on Long Term Ecological Observatories (LTEO)

Records of the geological past shows that ecosystems have some capacity to adapt naturally to climate change but this resilience has never been challenged by a large global human population and its multi-faceted

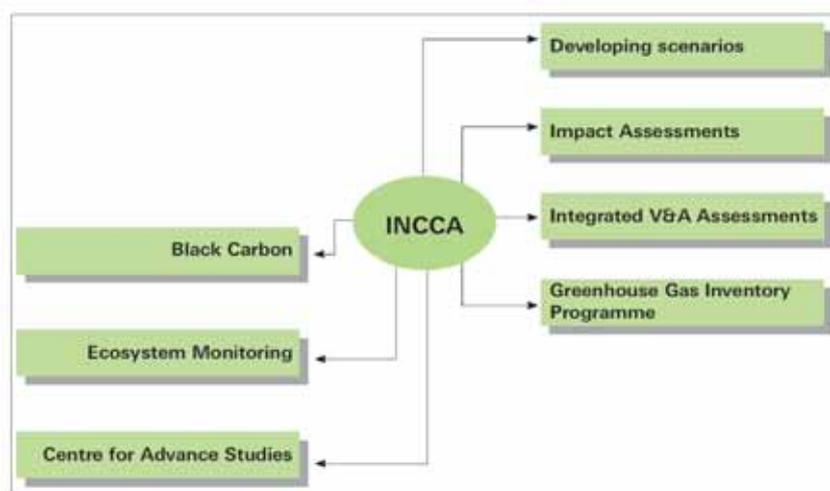


Fig-72. Programmes envisaged under INCCA

demands and pressures on ecosystems. The resilience of many ecosystems is likely to be exceeded by 2100 by an unprecedented combination of change in climate, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land-use change, pollution, over-exploitation of resources).

In view of the above, Ministry of Environment and Forests in association with other Ministries, State Government, Private sectors and Non Governmental Organisations, has proposed to develop and implement a programme on “long-term ecological observatories” which will include activities for experimental research in ecology. Centre for Ecological Sciences is proposed to act as coordinating agency for the scientific programme and the overall management of the project at the National level. 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.

### Coordinated Studies in the North Eastern Region

Climate Change is one of the biggest environmental threats in the world as well as in the Indian sub-continent. Potentially, impact is seen on food production and security, water supply, bio-diversity, fisheries, health and settlements. In order to have adequate information about different regions under the aegis of INCCA, a sectoral and regional climate change assessment have been made. The sectoral analysis for North-Eastern region has also been outlined in the report that reveals the significant projected changes in precipitation pattern, temperature change, agriculture, biodiversity and human health. The key results encourages to undertake

further studies on observational impacts on forest, biodiversity, water, agriculture, human settlement, and to identify vulnerability, develop adaptation and mitigation options for having climate benefits in the North eastern regions.

Considering the special features, natural resources and its susceptibility to threats of climate change, it is contemplated to undertake coordinated studies on Climate Change for North-East India under the aegis of INCCA. The research activities will be organised in a coordinated manner in the existing centres located in the area and institutions having expertise elsewhere. The objectives of the studies are as follows:

- To collect data, information and knowledge regarding all aspects of climate change, ecosystem functioning, socio-economic aspects of the region.
- To undertake activities to collect, collate and synthesis of the data and prepare report.
- To undertake research activities (Short, Medium and Long term) in areas such as water, agriculture, health etc. in respect of climate change in the region.

### Other Programmes under INCCA

#### Impact Assessments

Climate change has enormous implications to the natural resources and livelihoods of the people. The available knowledge suggests adverse implications to key sectors of the economy. Accordingly, a “Climate Change in India: 4×4 Assessment” has been devised to ascertain the impacts in 2030’s. The choice of the sectors and regions is in conformity with the significance and importance of the climate sensitive sectors of the economy that cover the well-being and livelihoods of the large population residing in these regions. The present assessment attempts to bring together what is known as four major regions in India, namely, Himalayan region, the North-Eastern region, the Western Ghats and the Coastal

Region in regard to observed climate and climate change projections for the year 2030s on 4 key sectors such as the agriculture, water, natural ecosystem, biodiversity and health.

### **Indo-UK Collaborative Research Programme on Climate Change - Impact and Adaptation - Phase II**

A joint collaborative research programme between the Government of United Kingdom, Department of Energy and Climate Change and the Ministry of Environment and Forests, Government of India, is currently operational. Research is being undertaken on various components viz., climate change scenarios, national level study on impacts and vulnerability, socio-economic impact and extreme events and adaptation response to climate change in the States of Odisha and Madhya Pradesh. Some of the key findings of the project are as follows:

Modelling results have estimated more severe/deficit monsoons towards the 2080s for the two study states. This project also assessed the link between water and agriculture in the major river basins i.e. Ganga basin and the Mahanadi basin of Madhya Pradesh and Odisha which indicates greater water loss due to evapo-transpiration whereas floods in the Ganga are expected to be more intense in mid-century, increasing further by the end of the century. The study also projects a 10-40% decline in crop production over the coming century. The state-specific assessment for Madhya Pradesh suggested an uncontrolled drop in wheat yields which may cause mass scale migration to urban centres whereas crop vulnerability of Odisha indicates a decrease in the Below Poverty Level population by 10.3 percent by 2020.

### **Intergovernmental panel on Climate Change (IPCC)**

The Intergovernmental panel on Climate Change (IPCC) is a specialized body jointly

established by the United Nations Environment Programme and World Meteorological Organization mandated to prepare scientific assessments on various aspects of climate change. IPCC has published its 4<sup>th</sup> Assessment Report in the year 2007 and has been entrusted with the task of preparing its Fifth Assessment Report on Climate Change, inter-alia, the physical science basis; impacts, vulnerability and adaptation; and mitigation of climate change based on the published peer-reviewed literature worldwide. As a nodal ministry in the Government it undertakes and facilitates implementation of various activities of the IPCC at both international and national level.

IPCC published two special reports namely, "Special Report on Managing the risk of extreme events and disasters to advance climate change adaptation (SREX)" and "Special Report on Renewable Energy Sources and Climate Change

Mitigation (SRREN)". Summary for Policy makers is available in the IPCC official website (<http://www.ipcc.ch/>).

### **Ozone Layer Protection**

#### **Introduction and Objectives**

- Ozone, a tri-atomic molecule is formed naturally in the upper level of the Earth's atmosphere by high-energy Ultraviolet (UV) radiation from the Sun. About 90 per cent of Ozone formed in this way lies between 15 and 55 kilometers above the Earth's surface, called the Stratosphere.
- The stratospheric Ozone Layer absorbs all the harmful UV-B radiations emanating from the Sun. It protects plant and animal life from UV radiation. The UV radiation has the potential to cause skin cancer, eye cataract, suppress body's immune system, decrease crop yield etc., which led to the adoption of the Vienna Convention for the Protection of the

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Ozone Layer in 1985 and the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. India ratified the Montreal Protocol and its London Amendment on 19<sup>th</sup> June, 1992. India also ratified the Copenhagen Amendment (1992), the Montreal Amendment (1997) and the Beijing Amendment (1999) on 3<sup>rd</sup> March, 2003.

- India was mainly producing and using nine of the 96 Ozone Depleting Substances (ODSs) controlled under the Montreal Protocol. These are CFC-11, CFC-12, CFC-113, Carbontetrachloride (CTC), Hydrochlorofluorocarbons-22 (HCFC-22), Halon-1211, Halon-1301, Methyl Chloroform and Methyl Bromide.
- The Government of India has entrusted the work relating to Ozone layer protection and implementation of the Montreal Protocol on substances that deplete the Ozone Layer to the Ministry.
- A detailed India Country Program for phase out of ODSs was prepared in 1993 to ensure the phase out of ODS according to the National Industrial Development Strategy, without undue burden to both consumers and industry by accessing the Protocol's Financial Mechanism in accordance with the requirements stipulated in the Montreal Protocol. The Country Program was updated in 2006.
- The Ministry has set up the Ozone Cell as a National Ozone Unit to render necessary services for effective and timely implementation of the Protocol and its ODS phase-out program in India. The Ministry has also established an Empowered Steering Committee (ESC) Chaired by the Secretary (E&F) which is supported by two Standing Committees, Technology and Finance Standing Committee (TFSC) and Standing Committee on Monitoring. The ESC is overall responsible for the implementation

of the Montreal Protocol provisions, review of various policy and implementation options, project approval and monitoring.

### Regulatory Measures

- The Ozone Depleting Substances (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986 has been notified in the Gazette of India on 19<sup>th</sup> July, 2000. These Rules set the deadlines for phasing out of various ODSs, besides regulating production, consumption, trade, import and export of ODSs and the products containing ODSs. The ODS Rules were amended in 2001, 2003, 2004, 2005 and 2007 to facilitate implementation of ODS phase-out by the enterprises in various sectors.
- These Rules prohibit the production and consumption of CFCs, CTC and Halons beyond 1<sup>st</sup> January, 2010 except use of pharmaceutical grade CFCs in manufacturing of Metered Dose Inhalers (MDIs). Further, the use of methyl bromide has been allowed upto 1<sup>st</sup> January, 2015. Since, HCFCs are used as interim substitute to replace CFCs, their production and consumption is allowed upto 1<sup>st</sup> January, 2030.
- The ODS rules will further be amended to cater the needs of accelerated phase-out of next category of ODSs, the HCFCs.

### Fiscal Measures

- Customs and Excise duty exemption have been extended for Multilateral Fund (MLF) assisted ODS phase-out projects or expansion of capacity with non-ODS technology during the financial year 2011-2012.

### Activities undertaken so far

- India has taken a series of fiscal and regulatory measures to facilitate ODS phase-out in the country. Among fiscal

- measures taken, the Government has accorded customs and excise duty exemptions on goods required for ODS phase-out projects and new investment and expansion of established industries with non-ODS technologies.
- The UN General Assembly on 23<sup>rd</sup> January, 1995 adopted a resolution 49/114 which proclaims 16<sup>th</sup> September as the International Day for the Preservation of the Ozone Layer, to commemorate the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer which was signed on 16<sup>th</sup> September, 1987. The International Day for the Preservation of the Ozone Layer is celebrated at national and state levels since 1995.
  - Awareness activities at the national and state levels were organized to sensitize the stakeholders to phase-out the ODS in various sectors. The International Ozone Day function is being organized every year in the country on 16<sup>th</sup> September.
  - "Montreal Protocol: India's Success Story", posters, stickers are brought out every year on the occasion of International Ozone Day giving latest information on ODS phase-out in the country and technologies adopted.
  - A bi-monthly newsletter viz. 'VATIS UPDATE-Ozone Layer Protection' is being published giving latest information on the science of Ozone and technical options evolved and used in various sectors all over the globe.
  - Participation in the Meetings of the Executive Committee (Ex-Com), Open Ended Working Group (OEWG), South Asia Network meeting and joint meeting of Regional Ozone Networks, Multilateral Environmental Agreement Regional Enforcement Network Meeting (MEAREN), Meeting of the Parties (MOP) and other Montreal Protocol related meetings.
  - Data on production, consumption, export, import of ODSs is being submitted to the Ozone Secretariat by end of September every year.
  - Organization of TFSC meetings for recommending ODSs phase-out projects for submission to the MLF Secretariat and recommending projects for fiscal incentives. In the year 2011, two meetings of TFSC were held and duty exemption certificate were issued to 7 enterprises.
  - No Objection certificates for 115 enterprises were issued to DGFT for import and export of ODSs and ODS based equipments.
  - Project Management Unit (PMU) was set up in 2002 to implement the CFC and CTC National Phase-out Plans.
  - The phase-out of HCFCs was accelerated by 10 years with certain reduction schedule vide decision XIX/6 of the 19<sup>th</sup> MOP in 2007.
  - A Roadmap for phasing-out of HCFCs was developed describing the long term vision and action plan including the policy instruments for phasing out of production and consumption of HCFCs in India.
  - An Action Plan for implementation of the Roadmap for phasing out of HCFCs in India has been developed indicating the responsibilities of agencies/organizations and timelines for its smooth and effective implementation.
  - The HCFC Phase-out Management Plan (HPMP) on Refrigeration and Air Conditioning (RAC) manufacturing and foam manufacturing sectoral strategy has been prepared in close cooperation with industry associations.
  - The RAC servicing sector strategy has been prepared by the servicing sector group of the industry under the guidance of GIZ, Govt. of Germany as

implementing agency in close cooperation with the Ozone Cell, MoEF.

- HPMP Stage-I, to comply with the 2013 and 2015 targets, has been prepared in close cooperation with the lead implementing agency and the associated agencies and has been submitted to the MLF Secretariat after the approval of the MoEF.

### Achievements made

- 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 1<sup>st</sup> 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 National Strategy for transition to non-CFC MDIs and plan for phase-out of CFCs in the manufacture of pharmaceutical MDIs in India has been successfully implemented.
  - India in consultation with the MDI manufacturers has withdrawn the EUN for 2011 and also committed not to seek any EUN for pharmaceutical grade CFCs in future. This was one of the commendable achievements in the MDI sector.
  - The Ex-Com of the MLF so far has approved a total of 301 projects involving MLF funding of US \$257,427,713 to the Indian industry for phase-out of production and consumption of 58,638 ODP tones of the ODSs in India.



Fig-73. Chief Guest Smt. Jayanthi Natarajan, (MEF) on Ozone Day celebration

- Training, workshops were organized for service technicians on good servicing practices and retrofitting of CFC based refrigeration appliances to non-CFCs. More than 10,000 technicians have been trained under the National CFC Consumption Phase-out Plan (NCCoPP).
- The 17<sup>th</sup> International Day for the Preservation of the Ozone Layer was celebrated in Delhi on 16<sup>th</sup> 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.
- On this occasion poster, painting, model making, slogan writing, quiz, skit competitions were organized among school children. Prizes for the best 3 in each competition were given. The publication "Montreal Protocol: India's

Success Story" was released and distributed to the participants on this occasion.

- India took an initiative to understand the issues related to the production and consumption of Hydrofluoro-carbons (HFCs) which are widely adopted as alternative to CFCs as well as HCFCs. An Indo-US workshop was organized in February, 2011. As a follow up of the workshop an India-US Task force was established under the Co-Chairmanship of Mr. J.M. Mauskar, Special Secretary, MoEF, Govt. of India and Mr. Daniel A. Reifsnyder, Deputy Assistant Secretary, US Department of State. The first meeting of the Task Force was held in June, 2011. A draft report of the task Force on HFCs has been prepared which would be finalized in consultation with India and USA.
- The combined 9<sup>th</sup> Meeting of the Conference of the Parties (COP) to the Vienna Convention for Protection of the Ozone Layer and 23<sup>rd</sup> MOP to the Montreal Protocol was held from 21<sup>st</sup> to 25<sup>th</sup> November, 2011 in Bali, Indonesia. The issues discussed during the above meeting including proposed amendments to the Montreal Protocol to bring phase-down of HFCs under the ambit of the Montreal Protocol, phase-out of HFC-23 by-product emissions, sustained mitigation of ODS emissions from feedstock, process agent uses, additional information on alternatives to ODSs and potential areas of focus for the 2014 quadrennial report of the Scientific Assessment Panel (SAP), the Environmental Effects Assessment Panel (EEAP) and the Technology and Economic Assessment Panel (TEAP). A number of ideas introduced in the Conference aimed at selectively advancing the agenda of developed countries were firmly opposed by India

in cooperation with like minded countries. India played a vital role in generating consensus and based on India's intervention, decisions were taken in the Conference to ensure that the interest of the country and Indian industry are protected.

- 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.
- The following workshops were conducted during this year:
  - A one day "Indo-US Workshop on HFCs" was organized on 18<sup>th</sup> February 2011 in Delhi to understand the issues related to the production and consumption of HFCs.
  - A stakeholder workshop on CTC was organized in close cooperation with UNEP on 21<sup>st</sup> and 22<sup>nd</sup> September, 2011.
  - The first meeting of the India-US Task Force on HFCs was convened on 22<sup>nd</sup> June 2011 at New Delhi to discuss various issues relating to HFCs especially the availability of transfer of technologies and implications of phase-down of HFCs.
  - A "Stakeholders Workshop on HPMP" was organized on 21<sup>st</sup> and 22<sup>nd</sup> October, 2011 in New Delhi with concerned industry stakeholders including members from IPUA, RAMA, Refrigerant Gas Manufacturers Association (REGMA), implementing agencies and bilateral agencies to finalise the HPMP.
  - In addition to these, Workshops and Seminars are also being organised on a regular basis for interaction with industry, Government bodies etc.

### Awards & Appreciations received so far

- The Ozone Cell of India was conferred "The Montreal Protocol Implementers Award, 2007" by the Montreal Protocol, Ozone Secretariat, UNEP, on the occasion of the 20<sup>th</sup> Anniversary of the Montreal Protocol held on 16<sup>th</sup> September, 2007 at Montreal, for its extraordinary contributions in effective implementation of the Montreal Protocol and the global effort to protect the Ozone Layer.
- The Ozone Cell of India was conferred "The Montreal Protocol Exemplary Project Recognition Award", for India's contribution to the project "Foam Sector Umbrella Project for conversion to CFC free technology". Projects on Ecological Refrigeration (ECOFRIG), Human and Institutional Development for Ecology Refrigeration (HIDECOR) and National CFC Consumption Phase-out Plan (NCCoPP) were conferred "The Montreal Protocol Exemplary Project Recognition Award" by the Montreal Protocol, Ozone Secretariat, UNEP, on the occasion of the 20<sup>th</sup> Anniversary of the Montreal Protocol held on 16<sup>th</sup> September, 2007 at Montreal.
- The Stratospheric Ozone Protection Award, 2008: In recognition of exceptional contributions to global environmental protection, was conferred on Dr. A. Duraisamy, Director, Ozone Cell by the United States Environmental Protection Agency (USEPA), Washington DC for "Leadership in Ozone Layer Protection" at a special ceremony on 19<sup>th</sup> May, 2008 at the Kennedy Center for the Performing Arts in Washington DC, U.S.A.
- The 22<sup>nd</sup> MOP of the Montreal Protocol held from 8<sup>th</sup> to 12<sup>th</sup> November, 2010 at Bangkok, Thailand congratulated Ozone Cell of India for its outstanding achievements for not seeking any CFCs for manufacturing of MDIs under the EUN provisions of the Montreal Protocol for the year 2011 and beyond.
- The 22<sup>nd</sup> MOP of the Montreal Protocol held from 8<sup>th</sup> to 12<sup>th</sup> November 2010 at Bangkok, Thailand 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 Article-5 Parties for conversion from pre-blended polyols with HCFC-141b to non-ODS technologies.
- The Montreal Protocol Certificate of Recognition was awarded to Ozone Cell of India on 7<sup>th</sup> October, 2011, for compliance with 2010 obligations to the phase out of Annexure-A, Group-I, Group-II and Annexure-B, Group-I, Group-II Ozone Depleting Substances, by the Ozone Secretariat for the Vienna Convention and the Montreal Protocol.

**CHAPTER-14**  
**INTERNATIONAL  
COOPERATION**



## Introduction

The Ministry of Environment and Forests is the nodal Ministry in the Government of India for all Multilateral Environmental Agreements. These include Vienna Convention for the Protection of the Ozone Layer, Montreal Protocol on Substances that deplete the Ozone Layer, Conventions on Biological Diversity, UN Framework Convention on Climate Change, UN Convention to Combat Desertification, Kyoto Protocol, the Basel Convention on Trans-boundary Movement of Hazardous Substances, Stockholm Convention on Persistent Organic Pollutants, Rotterdam Convention, Ramsar Convention etc.

International Co-operation Division is the nodal point within the Ministry to coordinate all international environmental cooperation and sustainable development issues. It is the nodal Division for United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), the World Bank, UNIDO, Global Environment Facility (GEF) and regional bodies like Economic & Social Commission for Asia & Pacific (ESCAP), South Asian Association for Regional Cooperation (SAARC), South Asia Cooperative Environment Programme (SACEP), Asian Development Bank and European Union (EU), India Brazil South Africa (IBSA) Summit on Environment, etc. The Division also handles bilateral country to country co-operation in the areas of environment protection. This Division also provides funds for deputation of officers for participation in meetings organized by UNEP, UNDESA, GEF and other UN Agencies and international organizations.

The division supports annual contribution to International Organizations such as ASEAN Green Fund, United Nations Convention to Combat Desertification, Integrated Mountain Development (ICIMOD), SAARC, SACEP etc.

## Progress/Achievements during the year

### United Nations Environment Programme (UNEP)

- The United Nations Environment Programme (UNEP) established in 1972, is the principle entity within the UN System to assist the developing countries in building scientific and technical capacity, fostering partnership and knowledge development to promote environment for sustainable development. Based in Nairobi, Kenya, UNEP activities range from assessment of environmental trends, especially early warning systems to deal with the environmental disasters and emergencies to the promotion of environmental science and information.
- One of the main responsibilities of the UNEP is to keep under review the world environmental situation and ensure that emerging environmental problems of wide international significance are prioritized and receive appropriate and adequate consideration by the Governments. UNEP has six priority areas viz: (i) climate change (ii) ecosystem management (iii) disasters and conflicts (iv) resource efficiency (v) harmful substances and hazardous waste and (vi) environment governance.
- The Governing Council/Global Ministerial Environment Forum of the UNEP is a high level environment policy forum which brings the world's environment ministers together to review the important and emerging policy issues in the field of the environment. The Council/Forum meets annually at Nairobi, Kenya in general sessions and outside Kenya in special sessions in alternate years.
- The UNEP Council/Forum had organized its 26<sup>th</sup> Session at Nairobi, Kenya from 21-24 February, 2011. The Council/Forum had focused on the overarching

theme of “Contribution of UNEP to the preparatory process of the United Nations Conference on Sustainable Development”. Under this theme, two interlinked topics were discussed :

- (i) Green Economy—benefits, challenges and risks associated with a green economy transition, and
  - (ii) International environmental governance.
- India being a member of the Governing Council, participated in the 26<sup>th</sup> Session of the Council/Forum at Nairobi from 21-24 February, 2011. Indian Delegation was led by Secretary (E&F). India reiterated its commitment to provide leadership and partnership in our collective quest for sustainable future. India also recalled the gains made at the 10<sup>th</sup> Meeting of the Conference of Parties (CoP) to the Convention of Biological Diversity at Nagoya, Japan and called upon the countries to come forward and ratify the Access and Benefit Sharing (ABS) Protocol at the earliest. The protocol contributes to conservation of biodiversity and equitable sharing of benefits.
  - India had also highlighted several initiatives taken for greening of the economy, which is seen as an opportunity to further growth. Simultaneously, it also drew caution to the possibility that the discourse of Green Economy may become a stumbling block in the way of other overriding priorities of developing economies. The scope of green economy should be clearly defined and universally accepted.
  - As regards International Environment Governance, India would support initiatives on creating a strong and credible interface on science policy and market development, achieving effectiveness and coherence within the UN System, securing sufficient, predictable

and coherent funds and ensuring a responsive approach including technology transfer and capacity building.

- The proceedings of the 26<sup>th</sup> GC/GMEF may be seen at UNEP website at [http://www.unep.org/gc/gc26/docs/Proceedings/K1170817\\_E-GC26-19\\_Proceedings.pdf](http://www.unep.org/gc/gc26/docs/Proceedings/K1170817_E-GC26-19_Proceedings.pdf) .
- Government of India provides contribution to the UNEP Environment Fund annually at the rate of US \$ 100,000. Contributions upto the calendar year 2011 has been transmitted to the UNEP Secretariat.

#### **UNEP's International Resource Panel and Steering Committee**

- Constituted in 2007 by the UNEP, the International Resource Panel (IRP) is a scientific panel of experts that supports science-based policy making on resource use and green economy strategies for providing scientific assessments and expert advice viz:
  - (i) Scientific assessments of policy relevant on sustainable use of natural resources and in particular, their environmental impacts over the full life cycle; and
  - (ii) Contribute a better understanding on how to decouple economic growth from environmental degradation.
- The International Resource Panel consists of 25 experts from leading institutions around the world involved with all aspects of resource use and management. The panel is co-chaired by Prof. Ernst Ulrich von Weizsacker, former Chairman of the Bundestag Environment Committee (Germany) and Dr. Ashok Khosla, President of the International Union for Conservation of Nature (IUCN) and Founder of the Development Alternatives, New Delhi, India. The panel is supported by a Steering Committee made up of representatives of many governments, the

- European Commission and other intergovernmental and civil society organizations. India is the member of the Steering Committee.
- The themes covered by the IRP's scientific assessments are:
    - Decoupling to provide a scientific understanding of resource productivity and decoupling economic growth from environmental harm, alongwith related policies and methodologies.
    - Environmental impacts to produce authoritative, coherent, policy-relevant assessments outlining those product groups and materials that are most responsible for environmental impacts and resource scarcity, and providing options for decreasing their impacts.
    - Global metals flows to help reuse and recycling activities of metals and establish the concept of 'material-cycles' within international society by providing scientific and authoritative assessments on the global extraction and use of metals.
    - Water efficiency to assess the status and options for decoupling economic growth from water usage, pollution and contamination by improving efficiency in water harvesting, demand and supply, and recycling in selected sectors.
    - Land and soil to assess global land use and soil management, exploring how these two dimensions of agriculture are connected and promoting sustainable management of land globally.
  - The Ministry of Environment & Forests has co-hosted the 9<sup>th</sup> Meeting of UNEP's International Resource Panel and Steering Committee in New Delhi from 18-22 November, 2011 in collaboration with

the United Nations Environment Programme (UNEP) and the Development Alternatives, New Delhi.

- The meeting of the International Resource Panel (IRP) was held on 18<sup>th</sup> & 20<sup>th</sup> November, 2011 to discuss selected issues like Decoupling (cities and water), Impacts (Clean Technology & Trade), Metals reports etc. A joint meeting of the International Resource Panel and Steering Committee was held on 21<sup>st</sup> & 22<sup>nd</sup> November, 2011. The joint meeting was inaugurated by Secretary (E&F), Ministry of Environment and Forests participated in the meeting of the Steering Committee. The Indian delegation made several important suggestions on the reports as well as on the operational procedures of the IRP. The Steering Committee considered revision of the operational procedures like appointment of Co-chairs, tenure of appointment, increase in the number of members of the International Resource Panel from present 25 to 40, etc.

### Global Environment Facility (GEF)

- India is a founder member of GEF ([www.gefweb.org](http://www.gefweb.org)), the largest multilateral funding mechanism providing incremental project grant to the developing countries on global environmental issues with local benefits. Set up in 1991, 182 governments are its members. India is both a donor and recipient of GEF grant. We chair and represent the GEF South Asia Constituency (comprising of Bangladesh, Bhutan, Nepal, Maldives and Sri Lanka) in the GEF Council meetings twice a year. The 4<sup>th</sup> GEF South Asia Constituency meeting was hosted by the Government of Sri Lanka in Colombo focusing on GEF 5 operational and programming issues.
- The Ministry of Environment and Forests (MoEF) is the GEF Operational Focal

Point for India for coordination and operational matters. Department of Economic Affairs (DEA) in Ministry of Finance is the GEF Political Focal Point for India dealing with policy and governance issues. The GEF Empowered Committee chaired by Secretary (E&F) guides, approves and overlooks GEF operations in the country.

- Since 1991, India has accessed USD 326 million as GEF grant and leveraged USD 2 billion of co-financing for climate change, biodiversity, land degradation, international waters and chemicals projects while contributing USD 51 million to the GEF Trust Fund (1991 - June 2014). India has received an indicative allocation of USD 129 million under GEF 5 cycle (July 2010 – June 2014) and in consultation with the concerned stakeholders, the Ministry has identified and prioritized concepts for GEF 5 programming. The detail project documents are under preparation.
- The Ministry organized GEF National Dialogue Workshop along with GEF Secretariat at Goa in September 2011 to review its current project portfolio as well as to program for the current GEF 5 cycle. The Dialogue underscored the fact that GEF India project portfolio is vibrant and strong not only in terms of the type/ nature of projects but also in terms of showcasing positive impacts. This trend needs to be strengthened. GEF India brochure and project flyers were released and are available at Ministry.

#### **GEF Small Grants Program (SGP) India**

- GEF Small Grants Program (SGP) provides project grant of USD 50,000 to NGOs and local communities to address environmental and livelihood challenges. SGP is operational in 122 countries and more than 12,000 grants have been awarded worldwide. In India,

the program started in 1997 and Centre for Environment Education was selected as the National Host Institution (NHI) by the Ministry in 2000 for this program. United Nations Development Programme (UNDP) is the GEF Implementing Agency for SGP. Till date, nearly 331 projects awarded worth USD 7.1 million of GEF grant while generated USD 8.9 million of co-financing.

- This year, four projects were national and internationally recognized and awarded for a) Earth Care Award 2011 was conferred to Energy Research Applications for promoting smokeless fuel from biomass waste and its impact on climate change mitigation and adaptation; b) NGO partner IBTADA's project on animal husbandry practices as sustainable livelihoods, empowering women through credit, self-help and alternative fuels/energy sources was the first 'Runners Up' for Outstanding Annual Report in medium category (50 lakhs to 5 crores) by CSO partners Forum in India; c) Maldhari Rural Action Group (MARAG)'s project on institutionalizing organic approach in land up-gradation to optimize livelihood options of poor families found space in UN Permanent Forum of Indigenous issues at New York and received tremendous response; and, d) SAMBANDH's project on promoting indigenous knowledge for bio-diversity conservation and its applications for health and livelihood security among tribal communities in India recognized by World Banks India Development Marketplace competition.

- SGP grant applications can be submitted year round. For more details visit, [www.sgpindia.org](http://www.sgpindia.org)

#### **New GEF-SGP OP 5 Project**

- The GEF Operational Phase (OP) 5 cycle is proposed to be operational for the period from 2012-2016 and the

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proposal has been submitted to UNDP for onward submission to GEF for CEO endorsement and operationalization. The GEF Grant for the entire project duration is 5,000,000 USD, the details of which are as follows:

Year	Amount in USD	Amount in INR (1 USD= Rs. 47)
2012-13	1,800,000	Rs. 8,46,00,000
2013-14	1,500,000	Rs. 7,05,00,000
2014-15	1,200,000	Rs. 5,64,00,000
2015-16	500,000	Rs. 2,35,00,000

- The objectives of the GEF OP 5 project are targeted to the Biodiversity (BD), Climate Change Mitigation (CCM) and Land Degradation (LD) Focal Areas. The project also supports the objectives of the 5<sup>th</sup> Operational Phase of the global SGP.
- Under the Biodiversity Focal Area, the project will support mainstreaming the biodiversity and seeks to increase the number of hectares of sustainably managed landscapes and seascapes that integrate biodiversity conservation and incorporate measures to conserve biodiversity into local level policy and planning framework.
- Under the Climate Change Mitigation (CCM) focal area, the project will provide grants to promote the demonstration, development and transfer of innovative low carbon solutions and low carbon practices at the community level, such as micro-solar power and fuel-efficient stoves, which would also lead to investments in renewable energy and reduced GHG emissions.
- The Land Degradation focal area includes: Agricultural and rangeland systems; and Forest landscapes. The project will seek to maintain or improve the flow of agro-ecosystem and forest ecosystem services to sustain community livelihoods.

### South Asian Association for Regional Cooperation (SAARC)

- The South Asian Association for Regional Cooperation (SAARC), which is an intergovernmental body, was established in 1985 with the aim to provide a platform for the people of South Asia to work together in a spirit of friendship, trust and understanding so that the process of economic and social development in Member States could be accelerated. The SAARC has eight countries as its members, viz., Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.
- With a view to provide directives and mandate for regional co-operation under the SAARC, the SAARC Secretariat organizes meeting of the Heads of State or Government once a year or more often as and when considered necessary by the Member States known as SAARC Summit. So far 17 Summits had been held.
- The 17<sup>th</sup> SAARC Summit was held on 10-11 of November 2011 in Addu City, Maldives. Three areas of cooperation were highlighted in the 17<sup>th</sup> Summit viz: trade, transport and economic integration; security issues such piracy and climate change; and good governance in which progress should be made. The Member States were called on to establish a commission to address issues of gender inequalities in South Asia. The following four agreements were signed in the Summit :
  - (i) SAARC Agreement on Rapid Response to Natural Disasters
  - (ii) SAARC Agreement on Multilateral Arrangement on Recognition of Conformity Assessment
  - (iii) SAARC Agreement on Implementation of Regional Standards

- (iv) SAARC Seed Bank Agreement
- So far, nine Environment Ministers' Conferences of SAARC countries have been held. The 9<sup>th</sup> Meeting of the SAARC Environment Ministers was held in Thimphu, Bhutan on 29<sup>th</sup> September, 2011. Prior to this, 4<sup>th</sup> meeting of the SAARC Technical Committee on Environment and Forestry was held at Thimphu, Bhutan on 27-28 September 2011. Additional Secretary in-charge of IC Division led the Indian Delegation in both the meetings.
- During the 8<sup>th</sup> meeting of the SAARC Environment Ministers held in New Delhi, India from 19-20 October, 2009, Minister for Environment and Forests had announced a one-time grant of one million US dollar each for capacity building and strengthening of SAARC Forestry Center in Bhutan and SAARC Coastal Management Center in Maldives equivalent to Rs. 10.00 crore. The Ministry has released the entire amount to the SAARC Secretariat, Kathmandu for onward transmission to the SAARC Forestry Center, Bhutan and SAARC Coastal Management Center, Maldives respectively.

### **South Asia Cooperative Environment Programme (SACEP)**

- The South Asia Cooperative Environment Programme (SACEP) was set up in 1982 with headquarters in Colombo, Sri Lanka. It aims to promote regional Co-operation in South Asia in the field of environment, both natural and human, in the context of sustainable development and on issues of economic and social development which also impinge on the environment and vice versa. It supports conservation and management of natural resources of the region by working closely with all national, regional, and international institutions, governmental and nongovernmental, as well as experts and

groups engaged in such co-operation and conservation efforts.

- Secretary, Ministry of Environment and Forests is the SACEP Focal Point for India. The SACEP holds its Governing Council (GC) meetings, which concentrate on current regional issues as well as global concerns.
- This Ministry provides Government of India's annual contribution to the SACEP. During the financial year 2011-12, the Ministry has released Rs. 14,34,686/- (US\$ 31,850) as annual contribution to the SACEP.

### **The World Bank**

- International Cooperation Division is nodal division for the overall World Bank portfolio in environmental projects. It coordinates the initial tying up of activities including crucial negotiations before the projects are actually started by the concerned thematic divisions.

### **Bilateral Cooperation**

Ministry of Environment and Forests has bilateral cooperation agreements with a number of countries such as the USA, UK, Canada, China, Germany, Denmark, Sweden, Norway, Finland etc. Most of these agreements are operated through the Joint Working Groups. These agreements provide mechanism for international interactions and consultation in the field of environment.

### **The main activities during the year**

#### **Action Plan Support Facility**

Action Plan Support Facility (APSF) was a programme designed to implement the India-EU Joint Action Plan. The Plan outlined cooperation initiatives in the field of environment/ climate in particular to develop dialogues on global environmental issues with a view to building mutual understanding on multilateral environmental agreements.

The total EC contribution of eight million Euro (to APSF) was divided between separate

components of environment, energy, academic cooperation and business and industry cooperation. The APSF environment component focused on the priority sectors of (a) Waste, (b) Climate Change, (c) Air Pollution, (d) Water and (e) Chemicals.

Two Study Tours under EU-India Action Plan Support Facility ( APSF) were organized by Economic Cooperation Section of European Union. The Study Tour on River Basin Management was held during 15-21 May, 2011 and Study Tour on 'Management of E-Wastes' was held during 22-29 May, 2011. Officers from the Ministry, CPCB and also from State Governments participated in it. The APSF programme has been concluded on 16<sup>th</sup> June, 2011.

### Joint Working Group Meeting with France

Second meeting of Joint Working Group on Environment has been held between India and France on 5<sup>th</sup> July, 2011 in Paris. The inter ministerial Indian Delegation in this meeting was led by Secretary ( E & F) and besides JS(IC), the representatives of Ministry of Power, Ministry of Small and Medium Enterprises (MSME) as also representatives of business groups also participated in the meeting. The issues pertaining to Climate Change, Bio-diversity, Energy Efficiency, New and Renewable Energy were discussed in the meeting.

### Agreements signed during the year

- A Memorandum of Understanding between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Conservation of the Sunderban was signed in September, 2011.

The MoU seeks to facilitate cooperation in the areas of conservation of biodiversity, joint management of resources, livelihood generation for poverty alleviation and development, cataloging of local flora

and fauna and studying the impacts of climate change. A working Group would be set up to implement the activities under MoU. The MoU is valid for an initial period of five years which can be extended further through mutual consent.

- A Protocol between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Conservation of the Royal Bengal Tiger of the Sunderban was signed on 6<sup>th</sup> September, 2011.

The Protocol on Conservation of the Royal Bengal Tiger of the Sunderban provides for bilateral cooperation in undertaking scientific research, knowledge sharing and patrolling of the Sunderban waterways on their respective sides to prevent poaching or smuggling of derivatives from wildlife and bilateral initiatives to ensure survival and conservation of the Royal Bengal Tiger in the unique ecosystem of the Sunderban. The Protocol also provides for cooperation to promote understanding and knowledge of Royal Bengal Tigers, exchange of personnel for training and promotion of education.

- A MoU on cooperation in the field of environment has been signed on 4<sup>th</sup> March, 2012 between Government of Republic of India and the Government of Arab Republic of Egypt.

The main areas of cooperation are Waste Management including Agricultural Waste, Electronic waste, Tackling the impact of climate change, the use of bio fuels, Marine environment protection and integrated coastal zone management, Air quality and water quality, the protection of wetlands & water conservation, Biological Diversity and nature conservation, Environmental information systems, Waste water management and reuse of treated effluents, Afforestation in arid areas etc.

### 5<sup>th</sup> Meeting of India- EU Environment Forum

5<sup>th</sup> Meeting of India- EU Environment Forum was held on 29<sup>th</sup> September, 2011 in New Delhi. The theme of the meeting was "Securing Biodiversity". The meeting was co-chaired by Mr. Hem Pande, Joint Secretary, Ministry of Environment & Forests and Mr. Timo Makela, Director for International Affairs, Directorate General Environment, European Commission. The main items of discussion in the meeting were :

- The policies and measures on biodiversity in India
- The 2011 European Union strategy on biodiversity
- Indo-German project and study on biodiversity and livelihoods
- Indo-UK projects on rural livelihood
- Biodiversity conservation and management: Experience from GEF India
- EU-China cooperation on biodiversity: Capacity building as a key tool.
- Coastal and marine biodiversity in India
- Coastal ecosystems and climate change

### 7<sup>th</sup> Meeting of India-EU Joint Working Group on Environment

7<sup>th</sup> Meeting of India-EU Joint Working Group on Environment was held on 30<sup>th</sup> September, 2011 in New Delhi. The meeting was presided over by Mr. Hem Pande, Joint secretary from Indian side and Mr. Timo Makela, Director for International Affairs, Directorate General Environment, European Commission. The meeting, inter-alia, discussed follow-up to the Environment Forum on Chemicals, Rio+20 preparation of positions on both sides, Preparation for Durban United Nation Framework Convention on Climate Change (UNFCCC) and 11<sup>th</sup> Conference of Parties ( CoP 11) to Convention on Biological

Diversity (CBD) to be hosted by India at Hyderabad during 1<sup>st</sup>-19<sup>th</sup> October, 2012.

### Activities Scheduled

Joint Working Group meetings with Norway, Sweden, Finland and Canada are proposed in the upcoming year viz. 2012.

### Externally Aided Projects (EAPs) / North-East Cell

The Externally Aided Projects (EAP) Division deals with the appraisals, approvals and monitoring of Forestry Projects being implemented in the States with assistance from external donors. These projects are implemented in the States with assistance from external funding agencies viz. Japan International Cooperation Agency (JICA), AFD (French Development Agency), World Bank (WB), etc.

The funds are utilized for promoting afforestation, rehabilitation of degraded forest areas, water and soil conservation measures, farm forestry, agro forestry with the aim to increase forest and tree cover as well as to augment availability of fuel wood and fodder, improve the livelihood opportunities and quality of life of the villagers adjoining forests, strengthening joint forest management institutions to ensure people's participation, besides encouraging tree growing on private land as well as greening of the urban areas in accordance to the objectives envisaged in various projects under implementation. These projects inter-alia also aim at low-key economic activities with a view to augment the income of the people, employment generation as well as addressing the sustainability in perpetuity once the funding ceases to flow due to completion of the project. These projects are reimbursed their actual expenditure as per the loan agreements.

At present, Eleven State Sector Forestry Projects with an investment of about Rs. 6453 Crores are being implemented in Ten States and another one project under Central Sector

titled "Capacity Building for Frontline Staff in Forestry Sector" with an outlay of Rs. 225 crores is being implemented in 11 States.

Details of projects under implementation, their components, Project objectives, project cost, project period etc. are given in the Table-50.

**Table-50.** Details of ongoing projects through financial assistance from external funding agencies

S. No.	Name of the Project	Implementing Agency/ State	Cost (Rs. Crores)	Funding Agency	Project Objectives	Components	Project Period
1.	Rajasthan Forestry and Biodiversity Project (Phase-II)	Rajasthan	1152	JICA	To enhance forest area and livelihood opportunities of the forest dependent people and to conserve biodiversity by undertaking afforestation and biodiversity conservation measures through JFM approach, thereby contributing to environmental conservation and socio-economic development of Rajasthan.	(i) Afforestation (ii) Agro Forestry (iii) Water conservation Structures (iv) Biodiversity Conservation (v) Community Mobilization (vi) Poverty Alleviation and Livelihood Improvement (vii) Capacity Building, Training & Research (viii) Monitoring and Evaluation (ix) Consulting Services	2011-12 to 2018-19
2.	Tamil Nadu Biodiversity Conservation and Greening Project	Tamil Nadu	686	JICA	To strengthen biodiversity conservation by improving ecosystem and the management capacity as well as undertaking tree planting outside the recorded forest areas, thereby contributing to environmental conservation and harmonized socio-economic development of Tamil Nadu.	(i) Biodiversity Conservation (ii) Increasing the Natural Resources base (iii) Institutional Capacity Development (iv) Consulting Services	2011-12 to 2018-19
3.	Sikkim Biodiversity Conservation and Forest Management Project	Sikkim	330	JICA	To strengthen biodiversity conservation activities and forest management capacity, and improve livelihood for local people who are dependent on forests by promoting sustainable biodiversity conservation, afforestation and income generation	(i) Forest and biodiversity conservation (ii) Eco -tourism (iii) Joint Forest Management (iv) Supporting Activities (v) Consulting Services	2010-11 to 2019-20

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S. No.	Name of the Project	Implementing Agency/ State	Cost (Rs. Crores)	Funding Agency	Project Objectives	Components	Project Period
					activities including eco-tourism for the community development, thereby contributing environment conservation and harmonized socio-economic development of Sikkim.		
4.	Capacity Development for Forest Management and Training of Personnel	Central Sector Project	225	JICA	To improve training environment for frontline staff through the rehabilitation of State Forest Training Institutes and through capacity building of frontline forestry staff putting emphasis on Joint Forest Management (JFM), thereby strengthening human resource development for sustainable forest management.	(i) To improve training environment for frontline staff through the rehabilitation of States (ii) Forest Training Institutes and through capacity building of frontline forestry staff putting emphasis on Joint Forest Management (JFM), thereby strengthening human resource development for sustainable forest management.	2008-09 to 2013-14 (5 years and 3 months)
5.	Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project	Uttar Pradesh	575	JICA	To restore degraded forests, to augment forest resources and to improve livelihood and empower the local people who are dependent on forests by promoting sustainable forest management including JFM plantation and community development, thereby improving environment and alleviating poverty	(i) Plantations, regeneration of forests, etc. (ii) Institutional Strengthening of PMU/DMUs/FMUs (iii) Rehabilitation of Forest Training Institute at Lucknow. (iv) Communication and Publication. (v) Monitoring and Evaluation. (vi) Physical Contingency (vii) Consulting Services	2008-09 to 2015-16
6.	Gujarat Forestry Development Project – Phase II	Gujarat	830	JICA	To restore degraded forests and improve the livelihoods for and empower the local people who are dependent on forests by promoting sustainable forest management including JFM plantation and community/ tribal development, thereby improving	(i) Preparatory works (ii) Departmental Forest Development and Management (iii) JFM Forest Development and Management (iv) Social Forestry Development and Management (v) Forest Research (vi) Communication and Publication (vii) Wildlife Conservation and	2007-08 to 2014-15

## Ministry of Environment & Forests

S. No.	Name of the Project	Implementing Agency/ State	Cost (Rs. Crores)	Funding Agency	Project Objectives	Components	Project Period
					environment and alleviating poverty.	Management (viii) Monitoring and Evaluation (ix) Phase-out works (x) Consulting Services (including price and physical cont.)	
7.	Tripura Forest Environmental Improvement and Poverty Alleviation Project	Tripura	460	JICA	To restore degraded forests and improve the livelihood aspects of villagers, including tribal families engaged in traditional shifting cultivation and promoting sustainable forest management through JFM, thereby improving environment and alleviating poverty	(i) Rehabilitation of degraded land. (ii) Rehabilitation of degraded and available non forest land. (iii) Farm forestry in Private holding. (iv) Eco-Development. (v) Service Support. (vi) Rehabilitation of families engaged in shifting cultivation. (vii) Interface forestry Development. (viii) Supporting Works.	2007-08 to 2014-15
8.	Swan River Integrated Watershed Management Project	Himachal Pradesh	162	JICA	To regenerate the forests, protect the agricultural land, and enhance agricultural and forestry production in the catchment area of the Swan River, Himachal Pradesh State, by carrying out the integrated watershed management activities including afforestation, civil works for soil and river management, soil protection and land reclamation, and livelihood improvement activities, thereby improving living conditions of people including the poor in the catchment area.	(i) Afforestation (ii) Civil Work for Soil & River Management (iii) Soil Protection & Land Reclamation (iv) Livelihood Improvement (v) Institutional Development	2006-07 to 2013-14
9.	Orissa Forestry Sector Development Project	Orissa	660	JICA	To restore degraded forests and improve the income level of villagers by promoting sustainable forest management including JFM plantation and Community/tribal development, thereby	(i) Protection and Conservation of Biodiversity of forests (ii) Improving productivity of natural forests. (iii) Providing livelihood options for the people (Support to VSS) (iv) Eco-development and	2006-07 to 2012-13

## Annual Report 2011-2012

S. No.	Name of the Project	Implementing Agency/ State	Cost (Rs. Crores)	Funding Agency	Project Objectives	Components	Project Period
					improving environment and alleviating poverty.	ecotourism activities (v) Catering to commercial and industrial demands. (vi) Capacity building of the Forest Department.	
10.	Karnataka Sustainable Forests Management & Bio-diversity Conservation Project.	Karnataka	745	JICA	To restore forests to bring about ecological restoration and also to facilitate livelihood improvement of the inhabitants of the project villages by afforestation through Joint Forest Planning and Management (JFPM) in the State of Karnataka, which further contributes to reducing poverty and preserving biodiversity conservation of the area.	(i) Afforestation (ii) Income Generation Activities for Poverty Alleviation (iii) Biodiversity Conservation (iv) Provision of Basic Infrastructure Support for Field work. (v) Supporting Activities for Forest Management (Research and Training, Consultancy, and Enhancement of Geographic Information System (GIS) and Management Information System (MIS)	2005-06 to 2012-13
11.	Tamil Nadu Afforestation project phase-II	Tamil Nadu	567	JICA	To restore forests to bring about ecological restoration and also to facilitate livelihood improvement of the inhabitants of the project villages by afforestation through Joint Forest Management in the State of Tamil Nadu, which further contributes to reducing poverty in the area.	(i) Integrated Watershed Development (ii) Integrated Tribal Development (iii) Forestry Extension (iv) Urban Forestry (v) Capacity Building Research Support (vi) Human Resources Development (vii) Establishment of Modern Nurseries (viii) Improving the infrastructural facilities (ix) Administration (x) Monitoring and Evaluation	2005-06 to 2012-13
12.	Integrated Natural Resources Management and Poverty Reduction Project in Haryana	Haryana	286	JICA	A. To rehabilitate forest lands in an ecologically sustainable manner.  B. To improve the quality of life of the villagers and adjoining forests	(i) Soil and Water Conservation (ii) Plantation model and nursery development (iii) Poverty reduction and institution building (iv) Technical assistance (v) Supporting activities (vi) Administration Staff.	2004-05 to 2010-11
	<b>TOTAL</b>		<b>6678</b>				

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### Projects finalized for external assistance

The following forestry projects have been finalized for external funding:

Integrated Forestry Development and Biodiversity Conservation through People's Participation in West Bengal (Minutes of Discussion signed on 18<sup>th</sup> October, 2011).

### Projects under consideration for external assistance:

The following forestry projects have been included for consideration under the Rolling Plan for FY 2010-12 for external funding:

- **Under consideration by Japan International Cooperation Agency (JICA)**
  - Integrated Forest Resources Management Project in Jammu & Kashmir
  - Nagaland Afforestation and Eco-development project
- **Under consideration by AFD (French Development Agency)**
  - Assam Project on Forest and Biodiversity Conservation

### Projects under appraisal/ clearance stage for external assistance

The following projects are proposed to be forwarded to external agencies for consideration in 2010-11:

- Simultaneous Treatment of Fringe Forest and Adjoining Non-forestlands for Conservation of Water, Bio-diversity, Sustainability of JFM and Poverty Alleviation (Central Sector Project).
- Andhra Pradesh Forest Productivity Enhancement Project
- Non Timber Forests Produce – Livelihood Possibilities in

Uttarakhand.

- Non Timber Forests Produce (NTFP) – Livelihood possibilities for local rural communities in the State of Madhya Pradesh.

EAP Division also acts as a nodal point, being the **North-East Cell**, in respect of North Eastern States for forestry related matters and following activities:

- Forest based industrial estates,
- Transportation of forest produce,
- Court cases in apex court, etc.

Case studies of JICA assisted Forestry Projects:

#### **I. 'Mangroves the Protector and Provider' – A Success Story, Mohanpur Village, Bhadrak Division (Odisha Forestry Sector Development Project**

Mohanpur is one of the villages chosen for intervention under the Odisha Forestry Sector Development Project (OFSDP). Mangroves had been lost from this village and the villagers were feeling unsafe. Under OFSDP 220 ha of mangrove plantation was raised in this village through active people's participation. Last year, during October, 2010 when the Odisha coast experienced cyclonic



Fig-74. Fodder grass for stall feeding



Fig-75. Mangrove plantation at Mohanpur village, Odisha

low pressure, the three years old Mangrove Plantation played a very crucial role in saving 800 acres of mature standing paddy crops from saline water intrusion. Mangrove plantation reduced the six ft. height fast tidal waves to three ft. height slow waves. Thus the saline water could not enter the agriculture field and paddy crop was saved. The villagers are also getting the following benefits due to the mangrove plantations:

- Mangrove plantations are acting like a breeding ground for crabs since they are free from crab and fish collection. Fishing folk get four to five kg crab catch from long line net where there was no crab catch earlier.
- The fishing communities are also getting fish and crab catch in the fish bone channels made for raising plantations, which are very near to the village.
- Fodder grasses are available in plenty and the villages have voluntarily banned open grazing and started stall feeding. Milk production has increased from four to six ltrs per day to eight to twelve ltrs per day.

The villagers have now resolved to protect the mangrove plantation areas, as a result of which natural regeneration is coming up as well. Thus, the three years old mangrove plantation has shown great promise not only to act as a bio-shield, but also providing livelihood securities to the coastal communities.

## II. Broom Grass Initiative of the Tripura JICA Project

- Centre of Excellence set up under the Tripura Forest Environmental improvement and Poverty Alleviation Project had taken up harvesting, processing, value addition and marketing of the broom grass in one of the Forest Ranges i.e. Pecharthal..
- The 14 Joint Forest Management Committees (JFMC) had collected 522 Tonnes of broom grass in Pechartal Range in Public-Private-Partnership (PPP) mode. The collectors got the collection charges @ Rs.33/- per Kilogram and the



Fig-76. Broom grass initiative of the Tripura JICA Project

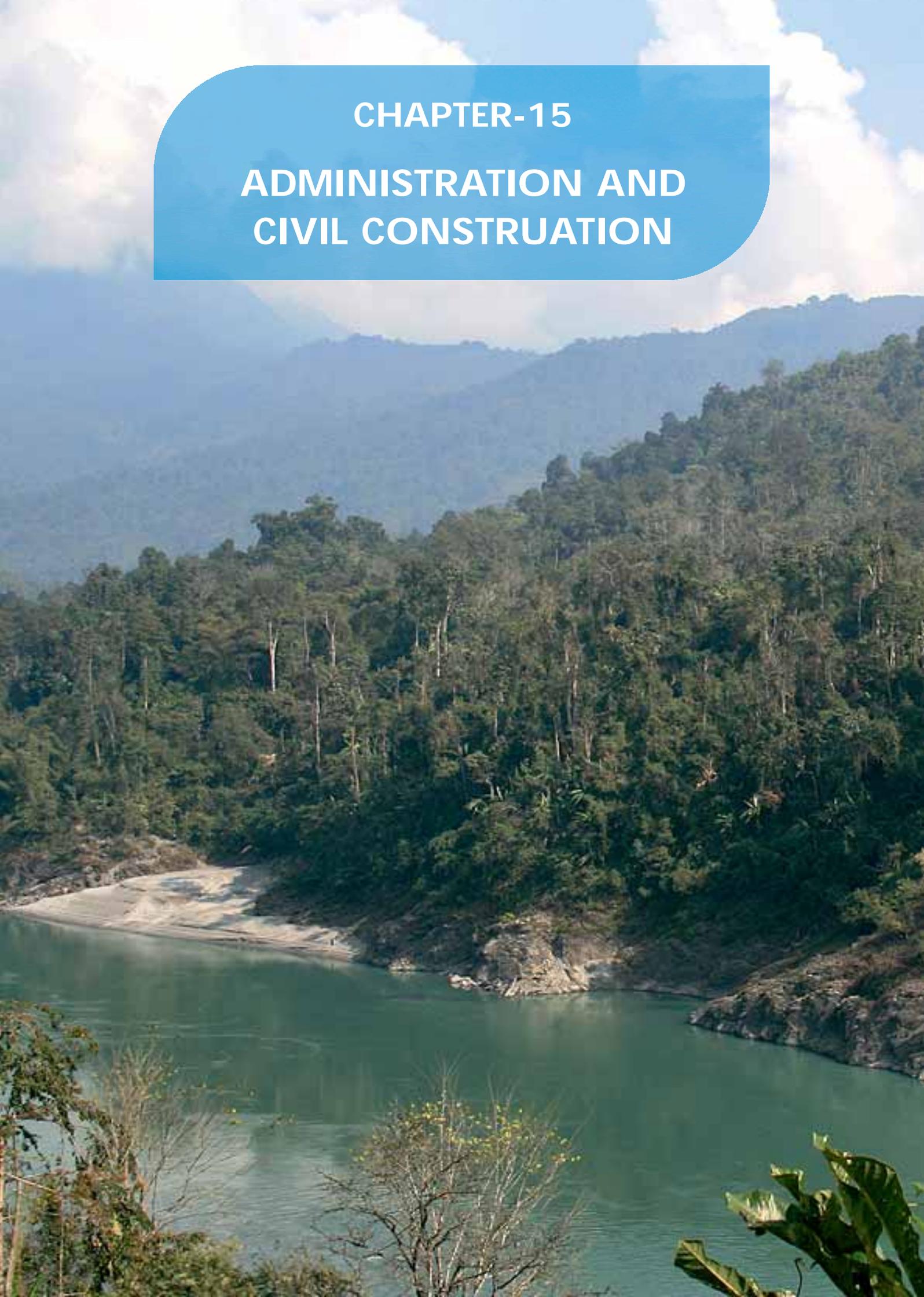
14

14 JFMCs received Rs. 1.72 Crores in just four months from December to March, 2011.

- The grass was partly sold and partly kept for value addition and selling as brooms. 26 Self Help Groups (SHGs) are involved in making of brooms. From the value addition every family is getting upto

Rs.500/- per day. The activity could generate employment to the participating forest dependent communities all through the year.

- The participating members of the JFMCs have voluntarily contributed Rs.50,000/- to the Government as royalty which is one of the unique instances of this kind.



**CHAPTER-15**  
**ADMINISTRATION AND  
CIVIL CONSTRUCTION**

## Personnel Administration

### Staff Position

The staff strength of the Ministry including NAEB, NRCD is given in Table-51.

The Ministry have outsourced some clerical/office support jobs to tide over the shortage of the staff during the year.

### Review and Promotion under FCS

The screening/interviews of Scientists, conducted during the current year under the Flexible Complementing Scheme (FCS), involving a two-tier system of evaluation for review/assessment of the Scientists for their promotion (Table-52).

### Recruitment

During the current year, the following posts of Scientists were filled by way of Direct Recruitment/Deputation:

<b>Ministry (Proper)</b>	06 posts of Scientist 'C' on DR basis
	01 post of Scientist 'E' on DR basis
	01 post of Scientist 'F' on DR basis

<b>National Museum of Natural History</b>	01 post of Scientist 'C' on DR basis
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<b>Botanical Survey of India</b>	01 Post of Director (Scientist 'G') on DR basis
	06 posts of Scientist 'C' on DR basis

### Indian Forest Service (IFS) Cadre Management

#### Mandate

- The Indian Forest Service (IFS) Cadre Management Division is enjoined upon to handle the business of the Ministry as the Cadre Controlling Authority for the Indian Forest Service (one of the three All India Service).
- The total authorized cadre strength of the Indian Forest Service as on 1<sup>st</sup> January, 2011 is 3079 (three thousand seventy nine) which includes 2146 Direct Recruits and 933 Promotion posts. The Total Senior Duty Posts (SDP) in the Indian Forest Service are 1881 and remaining under various reserves. Besides serving the 31 Forest Departments in the States and Union Territories managing the country's natural resources, a good number of the IFS officers are in various

**Table-51.** Number of employees in various groups and with reservation positions.

Group of Post	Sanctioned Strength	Number in position	Scheduled Caste	Scheduled Tribes	OBCs	Physically Handicapped
A	191	178	13	3	9	2
B	285	230	29	7	9	4
C	392	272	89	15	11	4
Total	868	680	131	25	29	10

**Table-52.** The screening/interviews of Scientists, conducted during the year under the Flexible Complementing Scheme (FCS)

Organisation	No. of Scientists screened for Interview	No. of Scientists successful in the Interview
Ministry (Proper) including Regional Offices	04	04
National River Conservation Directorate	02	02

Ministries and institutions both in the State and at the Central Deputation.

Main Activities of the IFS Cadre Management are:

- Determination of vacancies and framing of rules for Direct Recruitment and allocation of cadres to IFS probationers.
- Determination of vacancies for induction of State Forest Service Officers by promotion into Indian Forest Service, coordination of Selection Committee Meeting, Determination of Year of Allotments Seniority.
- Cadre of Review of revision in the composition and strength of IFS in various cadres.
- Selection/ appointment of IFS officers to various posts under Central Staffing Scheme of the Ministry and to various autonomous bodies including Indian Council of Forestry Research & Education, Dehradun; Indian Institute of Forest Management, Bhopal and Wildlife Institute of India, Dehradun
- Facilitation of Selection/Appointment of IFS officers against the Central Staffing Scheme of Department of Personnel & Training (DoPT).
- Finalization of various service matters like inter-cadre transfers, inter-cadre deputations, cadre clearance for placements/trainings and post retirement benefits to the officers.
- Management of AGMUT cadre including promotions, transfers, postings and other service matters.

### Progress/Achievements during the year

- The IFS Cadre Management Division of the Ministry deals with the broad items of work relating to the Indian Forest Service.
- Direct Recruitment to the Indian Forest Service.

- Allocation of IFS Probationers to various State cadres.
- Up-to-date Civil List of IFS officers is available on the website of this Ministry at [www.ifs.nic.in](http://www.ifs.nic.in) besides, vacancy circulars, training programme circulars, Rules and Regulations concerning IFS, ACR availability status of IFS officers are also hosted on this site for the benefit of the members of the Service. Each and every member of Service has been provided facility to have his unique Email account through NIC on this site and members of Service have been provided facility to update data relating to their posting details online for periodical upgradation.
- Eighty five Direct Recruit Officers on the basis of IFS Examination, 2009 were included into the Service.
- Thirty-six State Forest Service officers were included into the Indian Forest Service under IFS (Appointment by Promotion) Regulations, during the year 2009.
- About 21 IFS officers joined at various levels under the Central Staffing Scheme of the Ministry and about 10 IFS officers joined under the Central Staffing Scheme of the Department of Personnel & Training.
- Meeting of the Cadre Review Committee were held to review the strength and composition of four cadres, namely Jharkhand, West Bengal, Himachal Pradesh and Karnataka.
- Around 80 Court Cases pending in various Courts across the Country were liquidated. Around 450 Court Cases relating to the issues of IFS Cadre are pending in various Tribunals/Courts all over the Country.
- For the first time, online system for filling up of the deputational posts under CSS was introduced.

- A Committee under the Chairmanship of Shri J.C. Kala, Director General of Forests (retired) was established to map Annual Recruitment Plan for Indian Forest Service for the next 20 years. The report of the Committee was received and follow up action on the same in consultation with the various stake holders has been initiated.

## Vigilance

The Vigilance Division is responsible for all vigilance/disciplinary matters relating to the Indian Forest Service officers in the Ministry and its attached and subordinate offices including autonomous organizations/ PSUs and IFS officers posted in the State Governments. The Vigilance Division functions under the direct control of Joint Secretary & Chief Vigilance Officer (CVO) with overall supervision by Secretary, Environment & Forests.

The Vigilance Division is responsible for examination and processing of disciplinary cases, appeals, reviews and memorials of Indian Forest Service Officers of all States/ Union Territories, Investigation of Complaints, Obtaining & Maintenance of Annual Immovable Property Returns, (APRs) placing the APRs in public domain i.e. on the website of the MoEF etc. Cases filed in various Benches of Central Administrative Tribunal and Courts in India in connection with the disciplinary matters are also handled in Vigilance Division. The prosecution cases launched against IFS Officers by Central Bureau of Investigation (CBI) and various States/Union Territories and also other Officers/Staff of the Ministry are also dealt with in Vigilance Division.

The Division requires frequent consultation with the Central Vigilance Commission, Union Public Service Commission (UPSC), Central Bureau of Investigation & Department of Personnel and Training (DoPT) as per rules and procedures laid down on the matter.

During the year, 24 Disciplinary Proceedings cases, 12 Appeal cases and 16 Prosecution cases were processed in the Vigilance Division. Court cases were pursued in the respective court/CAT Bench. Counter Reply was filed in about seven cases. 10 complaints were finally disposed of after obtaining and considering the investigation reports. 56 applications received under RTI Act were also processed and replies sent to the applicants. The progress on the disposal of DP, Appeal, Prosecution, Court cases and RTI cases as well as complaints is reviewed by JS&CVO from time to time.

About 900 Annual Property Returns as on 1<sup>st</sup> January, 2011 were received from Group 'A' & 'B' officers of the Ministry, including organizations under it, as well as State Governments of which 700 APRs were placed on the website of the Ministry till the end of December, 2011.

Based on the sensitive posts already identified in the Ministry, rotational transfers of officers and staff, who have put in three years or more in a sensitive post, are made. Sensitive posts have also been identified in various field organizations and rotational transfer from sensitive posts are effected in these organizations as and when required.

Vigilance Awareness Week was observed in the Ministry during the period from 31<sup>st</sup> October, 2011 to 5<sup>th</sup> November, 2011 and a pledge was administered by Secretary (E&F) to the officers & staff to bring about integrity and transparency in all spheres of activities and to work unstintingly for eradication of corruption in all spheres of life.

## Parliament

### Introduction

The Parliament Division in the Ministry is responsible for co-ordination of all parliament matters related to the Ministry. During the year 2011-12, a total number of 833 Parliament Questions pertaining to various

aspects of environment were answered by the Ministry (467 questions in the Lok Sabha, out of which 34 were starred and 433 were un-starred. A total of 366 questions were asked in the Rajya Sabha, out of which 44 were starred and 302 were un-starred). The questions covered a wide range of issues with which the Ministry is concerned, prominent among them being questions related to Forest Conservation, Wildlife Management, Pollution, EIA, Freshwater and Marine Conservation, Environmental Conservation, Climate Change and Meteorology, Environment Education, NGOs and Media, Environment and Forest Trade, Health and Sanitation, Water Management & Energy Studies etc.

The ENVIS Centre at WWF-India, under ENVIS scheme of the Ministry compiles the above mentioned Parliament Questions as

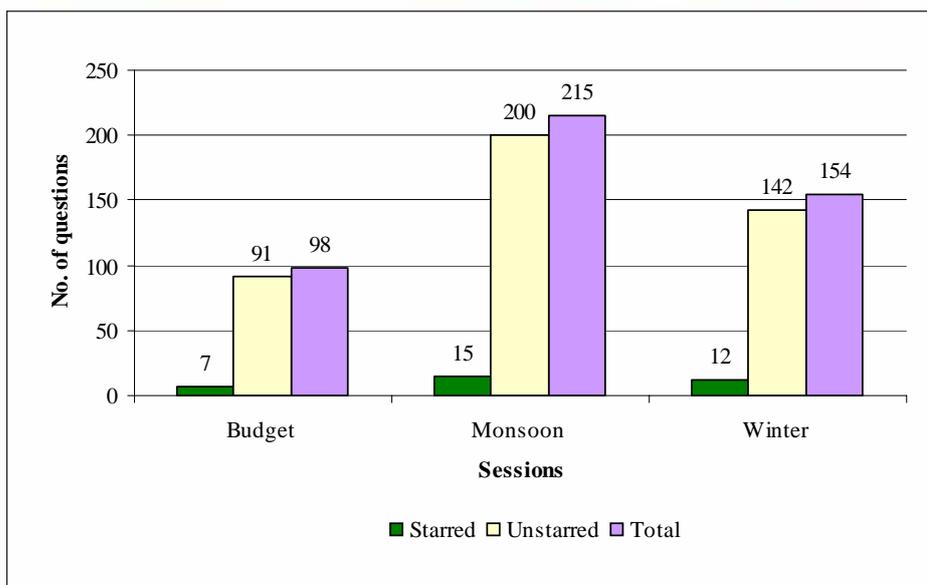


Fig-77. Number of questions replied by the Ministry in all sessions of Lok Sabha during 2011-2012

replied by MoEF and other Ministries pertaining to various environmental issues. Graphical representation of the Parliament Questions replied by the Ministry during 2011-12 both in Lok Sabha and Rajya Sabha in various sessions are given in Fig-77 and Fig-78.

Every Question/Answer is classified under various sub heads of environment as per the subject list available with the ENVIS Centre, WWF-India. This year subject-wise classified

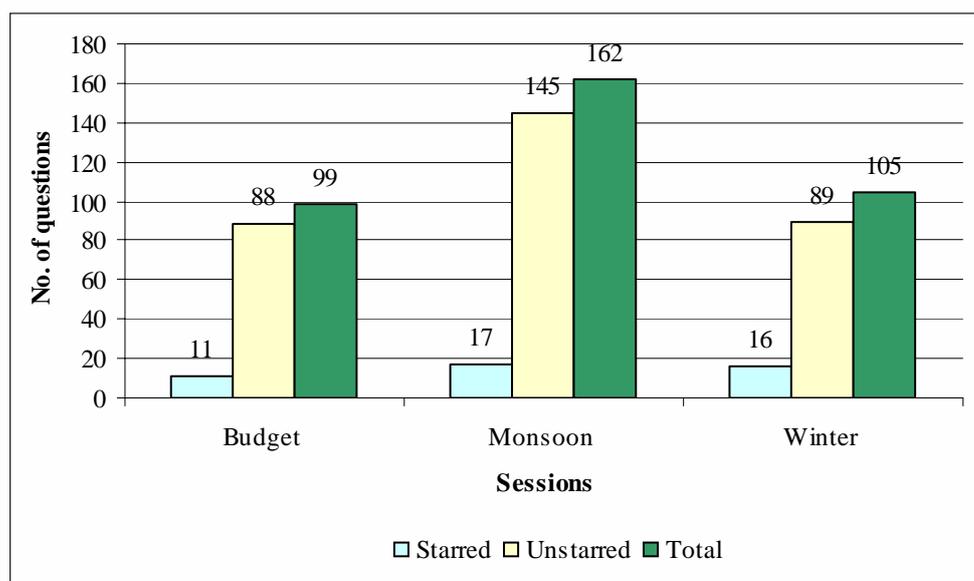


Fig-78. Number of questions replied by the Ministry in all sessions of Rajya Sabha during 2011-12

questions in Lok Sabha and Rajya Sabha sums up at 903 and 629 respectively. After classification, the total no. of questions in both Lok Sabha and Rajya Sabha rises in comparison to the unclassified data, because of the fact that a single question can attribute to more than one subject sub-head. Statistical representation

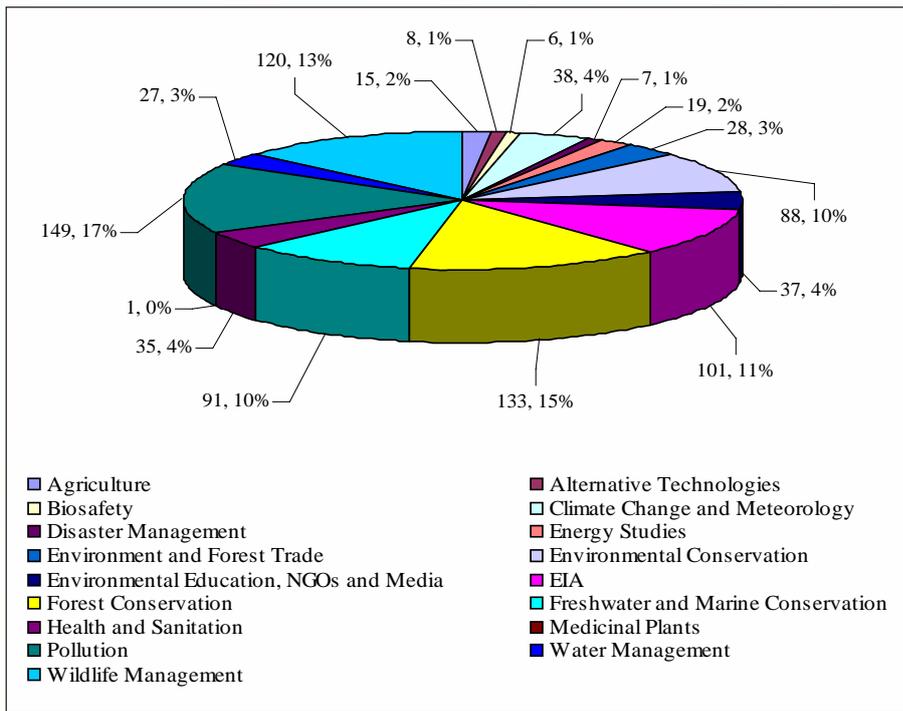


Fig-79. Subject-wise depiction of questions replied by the Ministry in Lok Sabha during 2011-2012

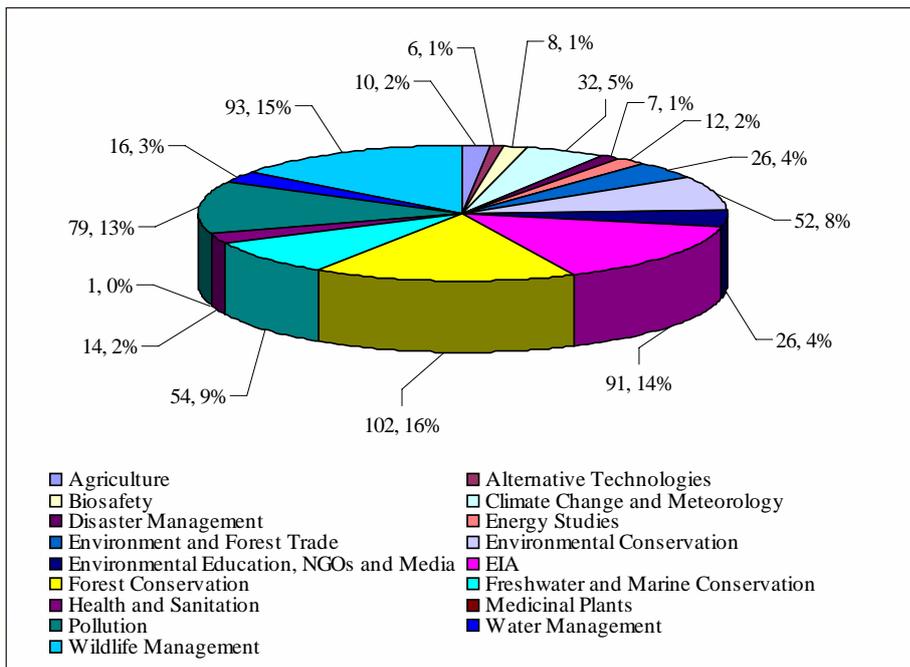


Fig-80. Subject-wise depiction of questions replied by the Ministry in Rajya Sabha during 2011-2012

depicting the subject-wise coverage of total no. of questions asked in both the houses of Parliament (Lok Sabha and Rajya Sabha) during the year 2011-12 is given in Fig-79 and Fig-80.

recorded in Departmental Records Room (DRR).

A proposal for Work Management Study (WMS) of scientific and technical posts in

The centre is currently working on the compendium of Environment in the Indian Parliament: An Analysis 2011 with the joint consensus of Parliament Section, MoEF. The preparation of the Trends & Analysis of the above-mentioned Parliamentary questions replied by the Ministry of Environment & Forests and other Ministries related to Environment is available with the ENVIS Centre at WWF-India. Online accessibility is also there with the Centre's website: <http://www.wwfenvis.nic.in>.

### Internal Work Study Unit (IWSU)

Activities relating to Internal Work Study are coordinated by IWS Unit of the Ministry. This is to insure timely action by various sections on proper record management and strict compliance of various provisions of the manual of office procedure.

### Progress/Achievements

During the year 2011-12 (as on 23<sup>rd</sup> February, 2012), Seven hundred forty seven files were

Ministry including NAEB and NRCDC, by the work management committee with a core member from Staff Inspection Unit (SIU), Department of Expenditure, is under process.

O&M inspections of the organizations under the Ministry and Sections/Divisions of the Ministry is a continuous process. O&M Inspection Reports of five subordinate/autonomous Institutions under the Ministry have been received during the year upto 23<sup>rd</sup> February, 2012.

### Information Technology and e-Governance

The Government has recognized Information Technology (IT) as a major tool for speedy implementation and monitoring of various schemes and decisions in public interest. Accordingly, Ministry has embarked on a comprehensive exercise to implement various e-Governance activities / projects with the objective of transforming the functioning of the Ministry, and also to transform the way the Ministry serves its various stakeholders.

### Progress/Achievements Made During

- The IT infrastructure of the Ministry, Botanical Survey of India and Zoological Survey of India was strengthened.
- Photographic digitization of 4850 Nos. Illustrations in the Old Archival Documents at Botanical Survey of India, Kolkata were completed.
- Implemented a comprehensive application of Comprehensive DDO Package (CompDDO) designed and developed by NIC specifically to meet the requirements of Drawing & Disbursement Officers (DDOs).
- GIS based Project Monitoring System for MoEF Projects is under implementation.
- Strengthened the network of BSI, Kolkata and ZSI, Kolkata
- Installed Video Conferencing equipment

for establishment of Video Conferencing facility with all the states.

- Strengthened the website of the Ministry.

### RTI Cell

The Ministry received one thousand five hundred seventy applications and one hundred forty two appeals under RTI Act, 2005 during the year 2011-12 (upto 21<sup>st</sup> February, 2012) as per RTI-MIS software.

Central Public Information Officers (CPIOs) and Appellate Authority (AAs) have been designated for effective implementation of RTI Act, 2005. The notification designating CPIOs/AAs is revised periodically.

A training programme for training of CPIOs in RTI matters was organized in September 2011, in collaboration with DoP&T and ISTM. Compliance with Section 4(1)b of the RTI Act, was ensured.

### Protocol Section

The Protocol Section deals with following activities:

- Providing comprehensive protocol arrangement for the Minister/Minister of State of Environment and Forests and senior officers of this Ministry. This includes working out the itinerary, booking of passage, baggage handling, customs/immigration/ security checks both at the time of Departure/Arrival of VIPs as well as Security Passes for Airport and Reserved/Ceremonial Lounge for MEF.
- To receive and see off foreign delegations VIPs who visits Paryavaran Bhavan to meet Minister/Minister of State/Secretary.
- To handle issue/ revalidation of Diplomatic/ Official Passports and getting note verbal and arranging visas from Embassies.
- To arrange passes for Independence Day/ Republic Day for under Secretary and above officers of this Ministry,

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- To arrange Domestic/ International ticketing of Minister/ Secretary (E&F)/ Spl. Secretary/DGF and various officers of the Ministry and payment of Bills thereof.
- Handling of work relating to Receptions at Rashtrapati Bhawan for VIPs upto Addl. Secretary levels.
- Examining /Passing of canteen bills on hospitality of US & above officers, ITDC, Ashoka at IGI Airport, Parliament House (N.Rly Catering), Tea Board/Coffee Board and VIP Guests of Hon'ble Minister/ Minister of State/ Secretary.
- Protocol division provided 905 Air tickets for domestic & International Sectors and arranged visas & visa notes for around 232 of different countries during the period.

### General Administration

The General Administration (GA) Division of the Ministry is entrusted with the responsibility of procurement of stationery, stores, equipments and providing logistics and support services to the officials of the Ministry including transport, communication, general upkeep etc. Some of the major initiative/activities of the Division during the year 2011-2012 are (i) the Ministry has acquired 9565 sq. mtr. of land at Aliganj, Jorbagh Road, New Delhi for construction of its own office building. The GA Division is working in tandem with various agencies involved in the project to complete the building by the end of 2012; (ii) the Division has hired 9754.78 sq. ft office space from NDMC at Palika Bhavan to decongest the office space at Paryavaran Bhavan. Some Divisions/Sections of the Ministry are expected to be shifted to Palika Bhavan soon; (iii) Bio-metric attendance system including face detection facility has been installed in the Ministry to ensure proper attendance.

### Public Grievance Cell

A Grievance Cell has been functioning in the Ministry to attend to the complaints of

public regarding forestry, environmental matters etc. Shri Atul Kaushik, Joint Secretary (PG) has been nominated as Public Grievance Officer of the Ministry.

The general public can meet the Public Grievance Officer every Wednesday from 10.00 AM to 1.00 PM. The main function of the Cell is to ensure timely redressal of public grievances by taking up the matter with the concerned authorities such as District Magistrates, Municipal Corporations, Pollution Control Boards, State Governments, etc. Most of the complaints related to:

- Unauthorised industries located in residential areas discharging harmful gases and hazardous effluents in the immediate neighbourhood.
- Environmental degradation due to mismanagement of civic amenities like location of waste dump, water logging etc.
- Poor maintenance of open areas and parks; and
- Commercial establishments operating illegally in the residential buildings causing nuisance to people living in the immediate vicinity.
- Non-settlement of payment of salary dues and retirement dues, benefits like pension etc. to staff.

The Public Grievance cases are thus monitored regularly at specified time intervals in MoEF and the replies are sent to the complainants as early as possible. Once the final replies are sent, the petition is treated as closed and the same is indicated in the statements prepared in respect of Public Grievances.

The staff of various Divisions/Sections have been trained by holding one-day video conferencing at Paryavaran Bhavan with the assistance of officials of the Department of the Administrative reforms & Public Grievances to dispose off the complaints online through

Centralized Public Grievance Redress and Monitoring Mechanism (CPGRAMS). To run the Centralized Public Grievances portal the Ids have been provided to the concerned sections/Divisions in the Ministry for quick disposal of grievances/monitoring and issuing reminders on-line.

Currently out of a total of 1625 grievances on Centralized Public Grievance Redress and Monitoring System (CPGRAMS), 717 are pending. The disposal rate is 56% which is a marked improvement from the rate of 32% in March, 2011. The PG Cell has envisaged a target of 80% in the year 2012-13 with extra efforts. So far as the postal Grievances are concerned 25 out of 54 grievances have been disposed off and steps are being taken to dispose off the remaining grievances.

Attention of concerned sections/ divisions concerned is drawn from time to time at the level of Divisional Head to expedite redressal of grievances. Some of the sections like FPD, CPA, FE, NAEB have done commendable work in this regard.

## Implementation of Official Language Policy

### Introduction

Sustained efforts were made to ensure proper compliance of the Official Language Policy of the Union as enshrined in the Constitution of India, the Official Languages Act, the Official Languages Rules, the Annual Programme and orders issued from time to time.

All documents coming under the purview of Sec. 3(3) of the O.L. Act were issued in Hindi and English bilingual form. The letters received in Hindi and representations/appeals signed in Hindi were replied to in Hindi ensuring 100% compliance of Rule 5 and Rule 7 (2) of the O.L. Rules.

## Hindi Salahkar Samiti

Actions were taken on the decisions taken in the meeting of Hindi Salahkar Samiti was organised under the Chairmanship of Hon'ble Minister of State (Independent Charge).

## Progress of Activities undertaken

### Official Language Implementation Committee

Under the Chairmanship of Joint Secretary (OL), the meetings of Official Language Implementation Committee were organised in every quarter, wherein position of implementation of Official Language Policy in the Divisions/Sections of the Ministry was reviewed.

### Hindi Workshop

Hindi Workshop was organised for the Officers and Staff in every quarter to enable them to carry out their day to day transaction in Hindi.

### Incentive Schemes

Incentive schemes were implemented in the Ministry to encourage and motivate the employees to increase the use of Hindi.

### Publication of Hindi Magazine "Paryavaran"

Publication of Hindi Magazine "Paryavaran" Special issues of "Paryavaran" Magazine on Bio-diversity was brought out.

### Inspections

High Powered Committee of Parliament on Official Language inspected our Attached/Subordinate Offices and PSU namely ZSI, Solan, ZSI, Pune, A & N I FDCO, Port Blair and WLCCB, New Delhi. In addition to these inspections, eleven Attached/Subordinate Offices were also inspected by Joint Secretary/Director (OL) to review the position of implementing Official Language Policy of the Union.

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## Hindi Fortnight

Hindi Fortnight was organised from 06<sup>th</sup> to 20<sup>th</sup> September, 2011 during which various Hindi competitions aimed at increasing progressive use of Official Language Hindi were organised. Employees of the Ministry, NAEB, NRCD and CCU participated in these competitions.

## Civil Construction Unit (CCU)

The Civil Construction Unit (CCU) was established in March 1987 for execution of civil works in the Ministry. This unit undertakes construction works for all the attached and subordinate offices of the Ministry such as BSI, ZSI, FSI, NMNH, IGNFA and autonomous bodies like IIFM, IPIRTI, WII, ICFRE and GBPIHED. The CCU has constructed a number of office buildings, laboratories, museums and residential accommodation at various places such as Almora, Dehradun, Bhopal, Delhi, Bangalore, Jabalpur, Coimbatore, Hyderabad and Kozhikode.

There are three divisions looking after construction activities throughout India. Two divisions are located at Delhi for works in Northern Region and the third division is located at Bengaluru for works in Southern Region.

Civil works of the Ministry are executed by CPWD where CCU does not have its own unit. CCU provides necessary inputs for planning and coordinates works being

executed by CPWD. The management of budget also rests with CCU.

Some of the important works in progress during the year 2011-2012 are:

- Construction of museum and auditorium blocks for Rajiv Gandhi Regional Museum of Natural History at Sawai Madhopur. The sanctioned cost of the project is Rs. 4100 lakhs.
- Construction of buildings for girls hostel, stores, car garages, car-cum-bus garages and reception centre for Govind Ballabh Pant Institute of Himalayan Environment & Development at Kosi Katarmal, Almora. The work is complete. The sanctioned cost of the project is Rs. 240 lakh.
- Development of botanic garden of Indian Republic at Noida. Sub Head: Entrance gate, security hut and parking. The sanctioned cost of the project is Rs. 153.05 lakh.
- Development of botanic garden of Indian Republic at Noida. Sub Head: Development of water bodies. The sanctioned cost of the project is Rs. 297.63 lakh.
- Upgradation, improvement, and maintenance of National Zoological Park, New Delhi.
- Construction of Indira Paryavaran Bhawan at Aliganj, New Delhi. The sanctioned cost of the project is Rs. 131.68 crores.



**CHAPTER-16**  
**PLAN COORDINATION**  
**AND BUDGET**

## Introduction

The Plan Coordination Division is responsible for the coordination of all plan schemes and programmes of the Ministry in close association with the Planning Commission. This involves preparation, monitoring and review of Five Year Plans, Annual Plans and the Annual Action Plans of the Ministry. The Division also looks after the monitoring of progress reports and reports under the 20-Point Programme (Point XV item No. 52 & 53).

### XI<sup>th</sup> Five Year Plan (2007-2012)

Ministry of Environment & Forests has an approved outlay of Rs. 10000.00 crore for its 11<sup>th</sup> Five Year Plan, 2007-12. It was allocated an outlay of Rs. 1351.00 crore in 2007-08, against which the actual utilization

amounted to Rs. 1349.73 crores. The Annual Plan 2008-09, second year of the 11<sup>th</sup> Plan had an approved outlay of Rs. 1500.00 crores against which the actual utilization amounted to Rs. 1483.02 crores. The Annual Plan 2009-10, third year of the 11<sup>th</sup> Plan had an approved outlay of Rs. 1880.00 crores, which had been reduced to Rs. 1650.00 crores in RE stage, against which the actual utilization amounted to Rs. 1630.69 crores. The Annual Plan 2010-11, fourth year of 11<sup>th</sup> Plan had an approved outlay of Rs 2200.00 crore, against which the actual expenditure amounted to Rs. 2180.36 crore. Current financial year 2011-12, terminal year of 11<sup>th</sup> Five Year Plan, the Ministry has been allocated an outlay of Rs.2300.00 crore, which was reduced to Rs.1902.00 crore at RE stage. Sector wise details are given in Table-53.

**Table-53.** XI<sup>th</sup> Plan Outlays / Expenditure

(Rs. crores)

Sl. No	Sector	XI Plan Outlay	2007-08		2008-09		2009-10		2010-11		2011-12	
			Outlay	Exp.	Outlay	Exp.	Outlay	Exp.	Outlay	Exp.	Outlay	Likely Exp.*
1	Environment	1246.01	259.16	224.22	261.38	240.42	291.42	253.03	480.17	465.63	621.21	504.94
2	National River Conservation Directorate	2540.00	340.00	320.94	340.00	326.12	577.33	426.69	751.71	754.95	751.71	468.32
3	Forestry & Wildlife	2943.99	371.61	361.73	475.00	520.87	599.63	572.00	592.12	582.77	573.08	566.74
4	National Afforestation and Eco-development Board	3150.00	359.23	422.05	398.62	370.71	386.62	354.97	352.00	353.17	330.00	340.00
5	Animal Welfare	120.00	21.00	20.79	25.00	24.90	25.00	24.00	24.00	23.84	24.00	24.00
	<b>Total</b>	<b>10000.00</b>	<b>1351.00</b>	<b>1349.73</b>	<b>1500.00</b>	<b>1483.02</b>	<b>1880.00</b>	<b>1630.69</b>	<b>2200.00</b>	<b>2180.36</b>	<b>2300.00</b>	<b>1902.00</b>

\* RE are likely to be utilized fully.

The progress of plan schemes are reviewed regularly in the Ministry and necessary corrective action is taken to ensure proper and meaningful deployment of resources with a view to build up the capacities of the State Governments in Forestry and Environment Sector, for the programmatic variegated Centrally Sponsored and Central Sector Schemes.

### Annual Plan 2012-13

An outlay of Rs 2430.00 crores has been allocated for the Annual Plan 2012-13 of the Ministry. The approved outlay comprises of Rs.1352.22 crores in Environment and Ecology Sector and Rs.1077.78 crores in the Forestry and Wildlife Sector. The sectoral details of approved outlay are given in Table-54.

**Table-54.** Annual Plan 2012-13: Approved Outlay

(Rs. crores)

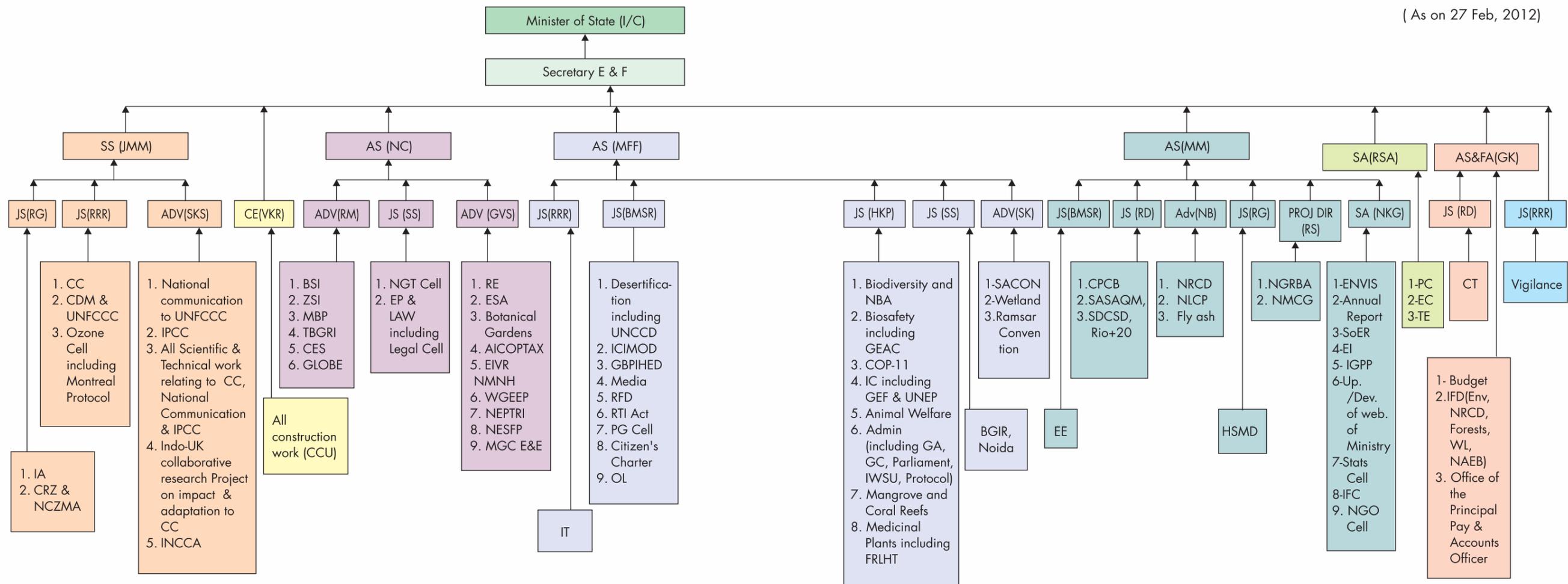
Sector	Outlay 2012-13
1. Environment	592.92
2. National River Conservation Directorate (NRCD)	759.30
3. Forests & Wildlife	606.09
4. National Afforestation and Eco-development Board (NAEB)	446.49
5. Animal Welfare	25.20
<b>Total (1-5)</b>	<b>2430.00</b>

16

**ORGANISATIONAL STRUCTURE OF  
( Divisions Under**

**MINISTRY OF ENVIRONMENT & FORESTS  
Environment Sector)**

( As on 27 Feb, 2012)



AW: Animal welfare  
 BGIR: Botanic Garden of the Indian Republic  
 BG: Botanic Garden  
 BSI: Botanical Survey of India  
 BCS: Bio-Diversity Conservation Scheme.  
 CC: Climate Change  
 CDM: Clean Development Mechanism  
 CMW: Conservation and management of Wetlands  
 CP: Control of Pollution  
 CRZ: Coastal regulation Zone  
 CPCB: Central Pollution Control Board  
 CBP: Capacity Building Project  
 CBD: Convention on Biological Diversity  
 CCU: Civil Construction Unit  
 EC - Economic Cell  
 EE: Environment Education  
 EI : Environment Information  
 EIVR: Entities of Incomparable Value Regulations  
 ENVIS: Environmental Information System  
 FE: Forest Establishment  
 GA: General Administration  
 NGO: Non Governmental Organisation

GBPIHED: G.B. Pant Institute of Himalayan Environment & -Development  
 GC: General Co-ordination  
 GEAC: Genetic Engineering Approval Committee  
 GEF: Global Environment Facility  
 HSMD: Hazardous Substances Management Division.  
 IA: Impact Assessment  
 IC: International Co-operation  
 ICIMOD: International Centre for Integrated Mountain Development  
 IFC: Information Facilitation Counter  
 IGPP: Indira Gandhi Paryavaran Puraskar  
 IPCC: International Panel on Climate Change  
 IWSU: Internal Work Study Unit  
 MBP: Man and Biosphere Programme  
 MGCE&E - Mahatma Gandhi Chair on Environment & Ecology  
 NBAP: National Biodiversity Action Plan  
 NATCOM: National Communication to UNFCCC  
 NBA: National Biodiversity Authority  
 NCZMA: National Coastal Zone Management Authority  
 NEPTRI - National Environmental Protection Training and Research Institute  
 NESPF - National Environmental Science Fellows Programme  
 FRLHT: Foundation for Revitalization of Local Health Traditions  
 NGRBA: National Ganga River Basin Authority

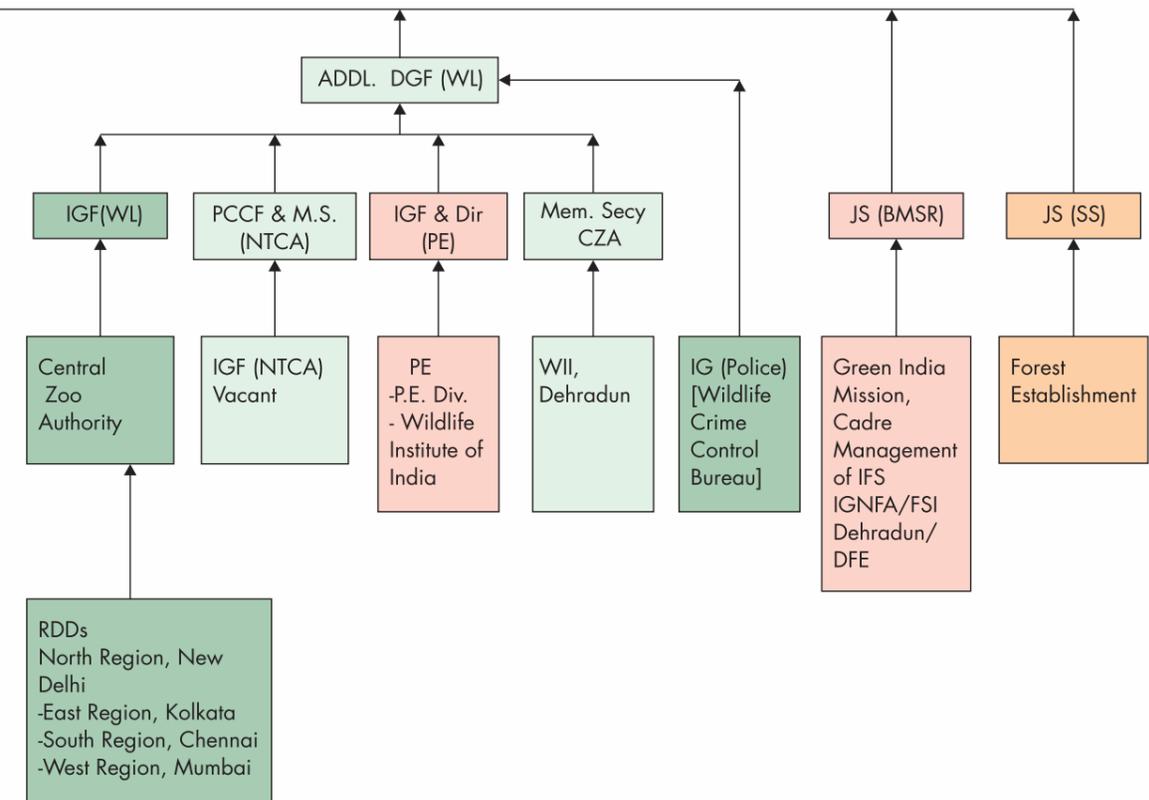
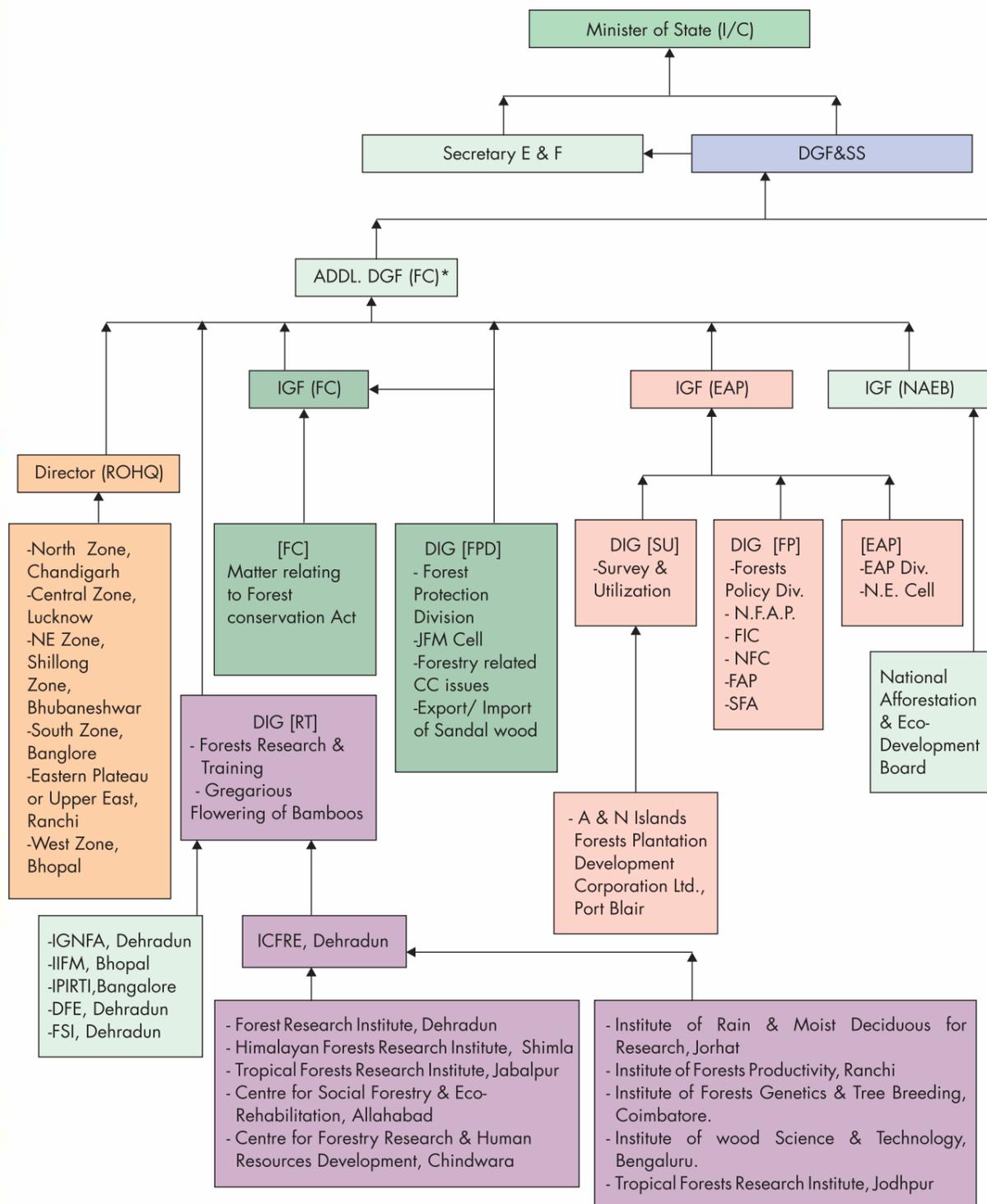
NLCP - National Lake Conservation Plan  
 NMCG- National Mission on Clean Ganga  
 NRC - National River Conservation Directorate  
 OL: Official Language  
 P&L: Policy and Law  
 PG: Public Grievances  
 PC: Plan Co-ordination  
 RC: Rotterdam Convention.  
 SACON: Salim Ali Centre for Ornithology & Natural History  
 SD: Sustainable Development  
 SoER: State of Environment Report  
 T&E - Trade & Environment  
 UNEP- United National Environment Programme  
 UNCCD: United Nations Convention to Combat Desertification  
 UNFCCC: United National Framework Convention on Climate Change  
 VIG: Vigilance  
 WGEEP - Western Ghat Ecology Expert Panel  
 ZSI: Zoological Survey of India

INCCA-Indian Network for Climate Change Assessment  
 W&RC-Wetland and Ramsar Convention  
 TBGRI-Tropical Botanical Garden and Research Institute  
 CES-Centre For Ecological Science  
 OC & MP-Ozone Cell & Montreal Protocol  
 RE-Research in Environment  
 ESA-Ecologically Sensitive Areas  
 AICOPTAX-All India Coordinated Project on Capacity Building in Taxonomy  
 NMNH-National Museum for Natural History  
 NESPF-National Environmental Sciences Fellows Programme  
 IFS- Indian Forest Service  
 FE- Forest Establishment  
 GIM-Green India Mission  
 GLOBE Global learning & Observation to Benefit the Environment- GLOBE

**ORGANISATIONAL STRUCTURE OF  
( Divisions Under Forestry**

**MINISTRY OF ENVIRONMENT & FORESTS  
and Wildlife Sector)**

( As on 24 Feb, 2012)



FC: Forest Conservation  
 FPD: Forest Protection Division  
 SU: Survey & Utilization  
 FP: Forest Policy  
 RT: Research & Training  
 NE: North Eastern  
 NZP: National Zoological Park  
 PT: Project Tigers  
 PE: Project Elephants  
 FSI: Forest Survey of India

JFM: Joint Forest Management  
 NFAP: National Forestry Action Programme  
 FIC: Forest International Cooperation  
 NFC: National Forest Commission  
 EAP: Externally Aided Projects  
 ROs: Regional Offices  
 WHC: World Heritage Convention  
 DFE: Directorate of Forests Education  
 WII: Wildlife Institute of India  
 WL: Wildlife

IGNFA: Indira Gandhi National Forests Academy  
 CITES: Convention on International Trade on Endangered Species  
 IPIRTI: Indian Plywood Industries Research and Training Institute  
 IIFM: Indian Institute of Forests Management  
 NAEB: National Afforestation & Eco-development Board

Regional Offices of the Ministry

S. No.	Regional Office	Phone and Fax Number	Jurisdiction of the Regional Offices
1.	Shri K.S Reddy, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (SZ), Kendriya Sadan, IVth Floor, E&F Wings, 17 <sup>th</sup> Main Road, Koramangala II Block, Bangalore-560034 (Karnataka) Email: roszeff@yahoo.co.in	Ph. No. 080-25635901 Fax No. 080-25537184	Andhra Pradesh, Goa, Karnataka, Kerala, Tamil Nadu, Puducherry and Lakshadweep
2.	Shri J.K. Tewari, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (EZ), A/3, Chandersekharpur, Bhubaneshwar-751023 Email: mef.or@nic.in	Ph. No. 0674-2301213 Fax No. 0674-2302432	Odisha, Andaman & Nicobar, Island, Bihar, Jharkhand and West Bengal
3.	Shri J.K. Tewari, IFS (Additional charge) Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal-462016 Email: rccfbhopal@gmail.com	Ph. No. 0755-2466525 Fax No. 0755-2463102	Madhya Pradesh, Chhattisgarh, Maharashtra, Gujarat, Dadra & Nagar Haveli, Daman & Diu
4.	Shri B.N. Jha, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (NEZ), Law-U-Sib, Lumbatngen, Near MTC Workshop, Shillong 793021 Email: moefshil_09@rediffmail.com	Ph. No. 0364-2537609 Fax No. 0364-2536041	Arunachal Pradesh, Assam, Manipur, Meghalaya, Tripura, Nagaland, Mizoram and Sikkim

<b>S. No.</b>	<b>Regional Office</b>	<b>Phone and Fax Number</b>	<b>Jurisdiction of the Regional Offices</b>
5.	Shri Azam Zaidi, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (CZ), Kendriya Bhawan, 5 <sup>th</sup> Floor, Sector "H", Aliganj, Lucknow-226020 <a href="http://moefrolko.org">http://moefrolko.org</a> Email: azamzaidi375@gmail.com	Ph. No. 0522-2326696 Fax No.0522-2324340	Uttar Pradesh, Uttarakhand and Rajasthan
6.	Shri S.K. Sehrawat, IFS, I/c Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (NZ), Bays No. 24-25, Sector 31 A, Dakshin Marg, Chandigarh-160030 <a href="http://nromoef.gov.in">http://nromoef.gov.in</a> Email: sehrawt@gmail.com	Ph No. 0172-2638135 Fax No. 0172-2638061	Haryana, Himachal Pradesh, Punjab, J&K, Chandigarh and Delhi

**Regional Centres of National Afforestation and Eco-Development Board**

<b>S. No.</b>	<b>Name &amp; Address of Regional Centre</b>	<b>State/UTs covered as per MOU</b>
1.	Regional Centre for NAEB Agriculture Finance Corporation Ltd. B-1/9, Community Centre, Janakpuri, New Delhi-110058	Haryana, Rajasthan, Uttar Pradesh, Uttarakhand and UT of Delhi
2.	Regional Centre for NAEB Agriculture Finance Corporation Ltd. Dhanraj Mahal, 1st Floor, CSM Marg, Mumbai-400001	Maharashtra, Gujarat, Goa and UTs of Daman & Diu, Dadar & Nagar Haveli
3.	Regional Centre for NAEB North Eastern Hill University, Shillong - 793 014	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura
4.	Regional Centre for NAEB University of Agricultural Sciences, GKVK Campus, Bengaluru-560065	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and UTs of Puducherry and Lakshadweep
5.	Regional Centre for NAEB Indian Institute of Forest Management, Nehru Nagar, Post Box no. 357, Bhopal-462003	Chhattisgarh, Madhya Pradesh and Orissa
6.	Regional Centre for NAEB Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan-173230	Himachal Pradesh, Jammu & Kashmir, Punjab and UT of Chandigarh
7.	Regional Centre for NAEB Jadavpur University, Kolkata-700032	Bihar, Jharkhand, Sikkim, West Bengal and UT of Andaman & Nicobar Islands

**Centres of Excellence / Autonomous / Associated Agencies etc.  
of Ministry of Environment and Forests**

<b>Sl.No.</b>	<b>Centres of Excellence</b>	<b>Contact Details</b>
1.	Centre for Environment Education (CEE), Nehru Foundation for Development, Thaltej Tekra, Ahmedabad – 380 054	Tel : 079-26858002-05, 26844745 Fax : 91-079-26858010 email: cee@ceeindia.org
2.	C.P.R Environmental Education Centre (CPREEC), 1 A, Eldams Road, Chennai – 600 018, Tamil Nadu	Tel : 044-24346526, 24338470 Fax : 91-44-24320756 email: cpreece@vsnl.com
3.	Centre for Ecological Sciences (CES), Indian Institute of Science (IISc) Bengaluru – 560 012, Karnataka	Tel:080-23600985 Fax:080-23601428 email: chairman@ces.iisc.ernet.in
4.	Centre for Mining Environment (CME), Indian School of Mines, Dhanbad – 826 004, Jharkhand	Tel : 0326-2296624, 2202486 Fax : 0326-2296563, 2296624 email:cme@ismdhanbad.ac.in
5.	Salim Ali Centre for Ornithology and Natural History (SACON), Anaikatty, Coimbatore – 641 108	Tel: 0422-2657101-105, 2657086 Fax : 0422 2657088 email:centre@sacon.ernet.in
6.	Centre for Environmental Management of Degraded Ecosystems (CEMDE), School of Environmental Studies, University of Delhi, Delhi – 110 007	Telefax: 011-27666237, 27667125 email : crb26@hotmail.com
7.	Madras School of Economics (MSE), Gandhi Mandampam Road, Kottur, Chennai – 600 025, Tamil Nadu	Telefax: 044-22300304, 22354847 Fax. : 044-22352155 email: info@mse.ac.in, mse@envis.nic.in
8.	Foundation for Revitalization of Local Health Traditions (FRLHT), 74/2, Jarakbande Kaval, Yelahanka, Attur P.O., Bengaluru – 560106	Tel.: 080-28568007, 28568000 Extn 205, Fax.: 080-28567926 email : dk.ved@frlht.org
9.	Jawaharlal Nahru Tropical Botanic Garden and Research Institute (JNTBGRI), Pacha Palode, Thiruvananthapuram – 695562, Kerala	Tel : 0472 - 2869246 Fax : 0472-2869646 email: director_tbgri@rediffmail.com
10.	Centre for Animals and Environment, CARTMAN, Koramangala, 6th Block, Bengaluru – 560 095, Karnataka	Tel.: 080-25530121, 25530304 email: cartmanblr@hotmail.com

**Autonomous Agencies**

**a) Environment Wing**

1	Central Pollution Control Board, Parivesh Bhawan CBD-cum-Office Complex, East Arjun Nagar, Delhi - 110 032	Tel : (011) 22308902, 22301932 Fax: (011) 22307233, 22304948 email: ccb.cpcb@nic.in
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- 2 Gobind Ballabh Pant Institute of Himalayan Environment and Development, Kosi - Katarmal, Almora - 263 643, Uttarakhand  
Tel : 05962-241015  
Fax : 05962-241014  
email: psdir@gbpihed.nic.in

**b) Forest Wing**

- 1 Indian Institute of Forest Management, P.B. No. 357, Nehru Nagar, Bhopal - 462 003  
Tel : (0755) 2775716, 2773799  
Fax: (0755)2772878, 2775988  
email:director@iifm.ac.in
- 2 Indian Plywood Industries Research and Training Institute, P.B. No. 2273, Tumkur Road, Bengaluru - 560 022  
Tel : (080) 8394231, 8394232/33  
Fax : 91-80-8396361  
email: contactus@ipirti.gov.in
- 3 Indian Council of Forestry Research and Education P.O. New Forests Dehradun - 248 006  
Tel : (0135) 2758614  
Fax: (0135) 2755353  
email: dg@icfre.org

**Research Institutes**

- 1 Forest Research Institute P.O. New Forests, Dehradun - 248 006  
Tel : (0135) 2755277  
Fax: (0135) 2756865  
email : dir\_fri@icfre.org
- 2 Institute of Forest Genetics and Tree Breeding, Forest College Campus P.B. No.1061, R.S. Puram P.O. Coimbatore - 641 002  
Tel : (0422) 2484100, 2484101  
Fax : (0422) 2430549  
email: dir\_ifgtb@icfre.org
- 3 Institute of Wood Science and Technology, 18th Cross, Malleswaram, Bengaluru - 560 003  
Tel : (080) 22190102, 22190100  
Fax : (080) 23340529  
email:scjoshi@icfre.org
- 4 Arid Forest Research Institute, P.O. Krishi Upaj Mandi, Basni, New Pali Road, Jodhpur – 342 005, Rajasthan  
Tel: (0291) 2722549  
Fax: (0291)2722764  
email: dir\_afri@icfre.org
- 5 Tropical Forest Research Institute P.O. RFRC, Mandla Road, Jabalpur - 482 021 Rajasthan  
Tel : (0761) 2840482  
Fax: (0761) 2840484  
email: dir\_tfri@icfre.org
- 6 Rain Forest Research Institute 'Deovan' P.B. No. 136, A.T. Road (East) Jorhat - 785 001, Assam  
Tel : (0376) 2350273/74  
Fax: (0376) 2350274  
email : dir\_rfri@icfre.org
- 7 Himalayan Forests Research Institute Conifer Campus, Panthaghathi, Shimla - 171 009, Himachal Pradesh  
Tel : (0177) 2626778  
Fax: (0177) 2626779  
email : dir\_hfri@icfre.org
- 8 Institute of Forest Productivity Ranchi - 834 001, Jharkhand  
Tel : (0651) 2948505, 2948515  
email : dir\_ifp@icfre.org

## Centres

- |   |   |   |
|---|---|---|
| 1 | Centre for Social Forestry & Eco-rehabilitation<br>Allahabad - 211 002, Uttar Pradesh     | Tel : (0532) 2440795<br>email : head_csfre@icfre.org                      |
| 2 | Centre for Forestry Research & Human Resource Development, Nagpur Road, Chhindwara-480001 | Tel: (07162) 282444<br>Fax: (07162) 254473<br>email: head_cfrhd@icfre.org |
| 3 | Forest Research Centre<br>Dulapally, Kakimpet (P.O.),<br>Hyderabad-500014                 | Tel: 040-23194188<br>Fax: 040-23095926<br>email: head_frc@icfre.org       |
| 4 | Advanced Centre for Bamboo and Rattan<br>Aizawl, Mizoram                                  | Tel: 0389-2301159, 2301157<br>email : imtienla@icfre.org                  |

## c) Wildlife Wing

- |   |  |   |
|---|--|---|
| 1 | Wildlife Institute of India,<br>P.B. No. 18, Chandrabani,<br>Dehradun - 248 001, Uttarakhand | Tel: 0135-2640111-15<br>Fax: 0135-2640117<br>email : wii@wii.gov.in |
| 2 | Central Zoo Authority<br>Bikaner House, Annexe VI<br>Shahjahan Road , New Delhi - 110011     | Tel : 011-23381585<br>Fax : 011-23386012<br>email : cza@nic.in      |

## Subordinate Offices

### a) Environment Wing

- |   |  |   |
|---|--|---|
| 1 | Botanical Survey of India<br>CGO Complex, 3rd MSO Building,<br>Block F, (5th & 6th floor) Sector 1,<br>Salt Lake City, Kolkata – 700 064 | Tel : 033-23346040/4963<br>Fax : 033-23215631, 23346040                     |
| 2 | Zoological Survey of India<br>Prani Vigyan Bhawan, M-Block,<br>New Alipur, Kolkata - 700 053   | Tel : (033) 24986820<br>Fax : (033) 24006893<br>email: venkyzsi50@yahoo.com |
| 3 | National Museum of Natural History,<br>FICCI Building, Barakhamba Road,<br>New Delhi - 110 001   | Tel : (011) 23314849<br>Fax : (011) 23314932<br>URL: www.nmnh.org           |

## Regional Centres of ZSI

- |    |   |   |
|----|---|---|
| 1  | Zoological Survey of India<br>North Eastern Regional Centre<br>Fruit Garden, Risa Colony, Shillong - 793003,<br>Meghalaya                         | Tel: 0364-2223638<br>Fax: 0364- 2226495<br>Email: zsishillong@rediffmail.com    |
| 2. | Zoological Survey of India,<br>Western Regional Centre,<br>Vidyanagar, Sector-29,<br>PCNT Post, Rawet Road, Akurdi,<br>Pune-411 044. Maharashtra. | Tel: 020-27655213/27651927<br>Fax: 020- 27652564<br>Email: wrszsipune@gmail.com |

3. Zoological Survey of India  
Northern Regional Centre  
218, Kaulagarh Road, Dehradun - 248195,  
Uttarakhand  
Tel: 0135-2756349, 2754939,  
2755279  
Telefax: 0135 2758362  
Email: zsisawal@sancharnet.in
4. Zoological Survey of India  
Central Zone Regional Centre  
168-169, Vijay Nagar Jabalpur, 482 002  
Madhya Pradesh  
Tel: 0761-2641792/2641421  
Fax: 0761- 2641421  
Email: zsicrs@dataone.in
5. The Officer-in-Charge  
Zoological Survey of India  
Desert Regional Centre  
Jhalamand, Pali Road, Jodhpur - 342005  
Tel: 0291 - 2728551, 2726213  
Email: drczsi@gmail.com
6. Zoological Survey of India  
Southern Regional Centre  
130 Santhome High Road, Chennai 600 028,  
Tel: 044-24642898, 24643255,  
24643378  
Email: srszsi@gmail.com
7. Zoological Survey of India  
Arunachal Pradesh Regional Centre  
Senki Valley, Itanagar - 791113,  
Arunachal Pradesh  
Tel: 0360 - 2203652, 2203689  
Email: srideep@rediffmail.com
8. Zoological Survey of India  
Gangetic Plains Regional Centre  
11 - D, Rajendra Nagar,  
Patna - 800016, Bihar  
Tel: 0612 - 2670686, 2664049  
Email: gprszsipatna@rediffmail.com
9. Zoological Survey of India  
Marine Aquarium & Research Center,  
Foreshore Road, Digha- 721428  
East Midnapore, West Bengal.  
Tel: 03220-266310,266311, 266312  
Fax: 03220-266310  
Email: marczsi@yahoo.co.in
10. Zoological Survey of India  
High Altitude Regional Centre  
Sapruon, Solan - 173211, Himachal Pradesh  
Tel: 01792-221060, 225721, 220413,  
224483  
Fax - 01792-221060,  
Email: hazoology@dataone.in
11. Zoological Survey of India  
Marine Biology Regional Centre  
130, Santhome High Road,  
Chennai - 600 028.  
Tel: 044 - 24642680/24643191  
Fax: 044 - 24642680  
Email: cvramanmbs@yahoo.com
12. Zoological Survey of India  
11, Horticulture Road, Haddo,  
Port Blair - 744 102  
Andaman & Nicobar Islands  
Tel: 03192 - 230115/237582/  
233148  
Fax: 03192 - 230115  
Email: anrszsi@gmail.com

13. Freshwater Biology Regional Centre  
Zoological Survey of India  
Plot No 366/1, Attapur (V), Near O/o DFO  
Flying Squad, Hyderguda (P.O.) Ring Road,  
Hyderabad - 500 048, Andhra Pradesh. Tel: 040-2400 2251, 2400 2250  
Email: fbszsihyd@yahoo.com
14. Sunderbans Regional Centre  
Zoological Survey of India,  
Canning- 743 329, 24 Pargana(s)  
West Bengal Tel: 03218-255211, 256721
15. Zoological Survey of India  
Estuarine Biology Regional Centre  
Hilltop, Gopalpur-on-Sea, Ganjam District,  
Odisha -761002 Tel: 0680-2243995, 2243996  
Fax: 0680- 2243996  
Email: zsiestuary@rediffmail.com
16. Zoological Survey of India  
Jafer Khan Colony, Eranhipalam (P.O),  
Kozhikode (Calicut) -673 006 Tel: 0495-2771929, 2771324  
Fax: 0495-2771929  
Email: zoolsurcalicut@dataone.in

### Regional Centres of BSI

1. Botanical Survey of India,  
Central Regional Centre, 10 Chatham Lines,  
Allahabad - 211 002, Uttar Pradesh Phone: (0532) 2441192.  
Fax No.: (0532) 2250179 2
2. Botanical Survey of India,  
Northern Regional Centre,  
192, Kaulagarh Road,  
Dehradun-248195, Uttarakhand. Fax: (0135) 2757951,  
Phone: (0135) 2753433, 2755478;  
E-mail: bsinc2001@rediffmail.com
3. Botanical Survey of India,  
Arid Zone Regional Centre,  
Near Khema Ka Kuan,  
Pal-Basni Canal Link Road,  
P.O. Nandan Van, Jodhpur- 342 008,  
Rajasthan. Fax: (0291) 2741736,  
Phone: (0291) 2740415, 2747163.  
E-mail: bsi\_azc@sancharnet.in
4. Botanical Survey of India,  
Western Regional Centre  
7, Koregaon Road, Pune-411 001 Tel/Fax: (020) 2612 4139  
Phone: (020) 26122125, 26139512  
E-mail: bsi\_wcpune@vsnl.net
5. Botanical Survey of India,  
Southern Regional Centre,  
T.N.A.U. Campus, Lawley Road,  
Coimbatore-641003, Tamil Nadu. Phone:(0422)2432123, 2432788, 2432487  
Fax:(0422) 2432835  
E-mail: bsisc@md4.vsnl.net. in
6. Botanical Survey of India,  
Eastern Regional Centre,  
Woodlands, Laitumkhrah,  
Shillong - 793 003, Meghalaya. Fax: (0364) 2224119  
Phone: (0364) 2223971  
E-mail: bsi\_ec@neline.com,  
bsibisihll@yahoo.co.in

7. Botanical Survey of India,  
Arunachal Field Station,  
Post Box No. 127, Sankie View,  
Itanagar - 791111, Arunachal Pradesh. Phone: 2212405  
Fax: (0360) 2211713  
E-mail: bsiafs@yahoo.com,  
botsurvey@sancharnet.in
8. Botanical Survey of India,  
Andaman & Nicobar Regional Centre.  
P.O. No.: 692, Haddo, Port Blair - 744102 Phone: (03192) 233224  
Fax: (03192) 230120  
E-mail: bsi\_anc@rediffmail.com
9. Botanical Survey of India,  
Sikkim Himalayan Regional Centre  
Below Rajbhawan Campus, P.O. - Rajbhawan,  
Gangtok - 737103, Sikkim. Phone: (03592) 202789  
Fax: (03592) 204717,  
E-mail: bsigangtok@hotmail.com,  
bsigangtok@india.com
10. Botanical Survey of India,  
Deccan Regional Centre,  
In Zoological Survey of India Campus,  
Plot No. 366/1, Attapur (v), Hyderguda (P.O.),  
Inner ring road, Hyderabad - 500 048,  
Andhra Pradesh. Tel:(040)-2002 0666  
Fax: (040) - 2400 2287,  
Email : bsi\_deccancircle@rediffmail.com

#### **b) Forest Wing**

1. Forest Survey of India,  
Kaulagarh Road, P.O. IPE,  
Dehradun-248195, Uttarakhand Telefax:(0135) 2756139, 2755037  
email: akw1954@gmail.com  
URL: www.fsi.nic.in
2. Indira Gandhi National Forest Academy  
P.O. New Forest,  
Dehradun - 248 006, Uttarakhand Tel : (0135)2757316  
Fax: (0135) 2757314  
email: director@ignfa.gov.in
3. Directorate of Forest Education  
P.O. New Forest, Dehradun - 248 006,  
Uttarakhand Tel: 0135-2757326  
Fax : 0135-2750125

#### **Regional Offices of Forest Survey of India**

1. Regional Director (Central Zone)  
Forest Survey of India, Central Zone  
C.G.O. Complex, Block 'A', Ground floor,  
East Wing, Seminary Hills, Nagpur-440006 Tel : 0172-2510194  
email: tejinder\_84@rediffmail.com
2. Regional Director (Eastern Zone)  
Forest Survey of India, 1B-198,  
Sec. 3, Salt Lake City, Kolkata - 700106 Telfax : 033-23355904  
email: regdirez@hotmail.com
3. Regional Director (Southern Zone)  
Forest Survey of India, 8th Floor, B-Wing,  
Kendriya Sadan, Koramangala,  
Bengaluru - 560034 Tel : 080-25520136  
Fax : 080-25520136  
email: fsisz@blr.vsnl.net.in

4. Regional Director (North Zone)  
Forest Survey of India, North Zone,  
1st Floor, Himlok Parisar, "Shivalik Khand",  
Batsley Longwood, Shimla - 171001,  
Himachal Pradesh
- Tel : 0177-2658285  
Fax : 0177-2655572, 2657517

**c) Wildlife Wing**

1. Director,  
National Zoological Park,  
Mathura Road, New Delhi - 110 003
- Tel : (011) 24359825, 24358500  
Fax : (011) 24352408

**Regional Offices**

1. Regional Dy. Director(SR)  
Wildlife Crime Control Bureau  
C2A,Rajaji Bhavan,Besant Nagar,  
Chennai-600 090.
- Tel : 044-24916747  
Fax: 044-24463477  
email: rddwccbsr@nic.in
2. Regional Dy. Director(ER)  
Wildlife Crime Control Bureau  
Nizam Palace, 2nd MSO Building,  
6th Floor, A.J.C Bose Road,  
Kolkata-700020.
- Telefax:033-22878698  
email: wlper1234@dataone.in
3. Regional Dy. Director(WR)  
Wildlife Crime Control Bureau  
11, Air Cargo Complex, Sahar,  
Mumbai-400099.
- Telefax:022-26828184  
email: rddwr@vsnl.com
4. Regional Dy. Director(CR)  
Wildlife Crime Control Bureau  
R.F.R.C, Mandla Road, T.F.R.I. Campus,  
Jabalpur-482021.
- Telefax:0761-2840689  
email: rddcr@yahoo.co.in
5. Regional Dy. Director(NR)  
Wildlife Crime Control Bureau  
Bikaner House, Shahjahan Road,  
New Delhi-110 011.
- Telefax:011-23384556  
email: ddrwildlife@yahoo.co.in

**Public Sector Undertaking**

1. Andaman & Nicobar Islands Forests and  
Plantation Development Corporation Ltd.  
Van Vikas Bhawan, Port Blair,  
Andaman & Nicobar Islands.
- Tel: 03192-232869  
Fax: 03192-233254

List of Projects Sanctioned during 2011-12

Environment Research Programme (ERP)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Evaluation of effects of environment pollutants in the pathogenesis of various cardio respiratory diseases in traffic police personals.	Dr. Dinesh Kumar Department of Anatomy Maulana Azad Medical College, New Delhi-110002.
2.	Microbial detoxification of toxic variety of <i>Jatropha curcas</i> seed cake for meal feed.	Dr. D. Somashekar, Fermentation Technology & Bioengineering Department, Central Food Technological Research Institute, Mysore-570013.
3.	Development of Titania based Materials for water disinfection.	Dr. R. Sakthivel, Materials Characterization Department, Institute of Minerals & Materials Technology, (Formerly Regional Research Laboratory) CSIR, Bhubaneswar-751 013, Orissa.
4.	Phytoextraction and Phytostabilization of heavy metal contaminated soils using <i>Foeniculum</i> and <i>Coriandrum</i> species".	Dr. (Mrs.) Chitra Pande, Department of Chemistry, Kumaun University, Nainital-263001, Uttaranchal.
5.	Monitoring of bidi workers occupationally exposed to tobacco dust.	Dr. K. Rudrama Devi, Professor and Head, Department of Zoology, University College of Science, Osmania University, Hyderabad-500007
6.	Recovery of value added products of medical importance from the solid wastes of meat industry.	Dr. C. Rose, Central Leather Research, Institute, Chennai
7.	Screening of <i>Citrullus lanatus</i> proteome to isolate and purify anti-fungal protins: a step towards formulation of Bio-fungicides to aid reduction of environment pollution.	Mrs. Savita Yadav, Department of Biophysics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029
8.	Nanopesticide formulation, characterization and chemo dynamics in rice model ecosystem.	Dr. N. Chandrasekaran, School of Bioscience and Technology, VIT University, Vellore-632014, Tamil Nadu
9.	High Performance compatibilized composites from recycled commingled plastic waste reinforced with halogen free nanosized flame retardants.	Dr. R.R.N.Sailaja Bhattacharya, Fellow, The Energy and Resources Institute (TERI), 4th main, 2nd cross, Domlur, Umroi Road, Meghalaya-793103

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| 10. | Assessment of habitat specific environmental mycobacterial pollution in North East India.                         | Dr. Dwipendra Thakuria, School of Natural Resources Management, College of Postgraduate Studies, Central Agricultural University, Umiam, Umroi Road, Meghalaya-793103 |
| 11. | Effective utilization of winery and vineyard waste: An eco-friendly approach for value addition in wine industry. | Dr. Mukund Vinayak Deshpande, National Chemical Laboratory, Homi Bhabha Road, Pune-411008   |

### Ecosystem Research Scheme (ERS)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Taxonomy and Ecology of the Himalayan Genus <i>Oxytropis</i> DC ( <i>Leguminosae</i> ) in India	Dr. L.B. Chaudhary, NBRI, Lucknow
2.	Habitat Ecology and Species Diversity of <i>Cordyceps</i> in district Pithoragarh, Central Himalayas	Dr. Chandra Singh Negi Asstt. Professor, Department of Zoology, LSM Government Post Graduate College, Pithoragarh (Uttarakhand), Pithoragarh-262502
3.	Studies on Ecology and Diversity of Nematodes of Pir Panjal Range in Jammu & Kashmir	Dr. A.A. Shah CBS School of Biosciences and Biotechnology, Baba Gulam Shah Badshah University, Rajouri, Jammu & Kashmir
4.	Studies on Abundance, Diversity and Eco-biology of Parasitic Hymenoptera of Rice ecosystems in Kerala.	Dr. M. Naseer Department of Zoology, University of Calicut, Calicut-673635, Kerala
5.	Ecosystem components, functioning and management of selected ponds of Sivaganga District, Tamil Nadu with varying utilization and conservation	Dr. D. Kanan Department of Botany, Thigarajar College, Madurai-625009, Tamil Nadu

### Eastern and Western Ghats Research Programme (E&WGRP)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Inventory of Vegetation with special reference to medicinal and aromatic plants and documentation of traditional knowledge in the Walyar Valley, Western Ghats	Dr. V.S. Ramachandran, Amrita Vishwa Vidyapeetham, Ettimadai, PO Coimbatore-641 105

## Ministry of Environment & Forests

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| 2. | Butterfly diversity in relation to landscape changes in the Walayar valley at Palakkad Gap in the Western ghats      | Dr. K.R. Sasidharan<br>Institute of Forest Genetics & Tree Breeding,<br>Coimbatore, Tamil Nadu, Coimbatore, Tamil Nadu       |
| 3. | Diversity of Acridoidea (Orthoptera) in different parts of Western Ghats of India                                    | Dr. Mohd. Kamil Usmani<br>Aligarh Muslim University, Aligarh   |
| 4. | Ecological investigation of woody vegetation and Nest Tree use by birds in the riverine forest of Athikkadavu Valley | Dr. P. Balasubramanian<br>Salim Ali Centre for Ornithology and Natural History (SACON), Anaikatty PO, Coimbatore, Tamil Nadu |

### National Wetland Conservation Programme (NWCP)

S. No.	Title of Project	Name of P.I	Duration	Amount sanctioned and released (1st installment)
1	Ecological studies on the Ranjit Sagar wetland and special reference to fish community structure	Dr Onkar Singh Brraich, Lecturer, Deptt of Zoology, Punjabi University, Patiala	3 years	Rs 22.40 lakhs Released Rs 10.40 lakhs as first year's grant
2	Ecological Status Survey of the Wetlands of Srikakulam District of Andhra Pradesh	SACON, Coimbatore	6 months	Rs 3.35 lakhs

### National Lake Conservation Plan

(as on 31st December, 2011)

S. No.	Lake	State	Sanctioned cost (in \$ crore)
1.	Three lakes of Bangalore namely Vengaiakhkere, Nagavara and Jarganahalli	Karnataka	11.48
2.	Bellandur lake, Bangalore	-do-	5.54
3.	Kotekere lake, Belgaum	-do-	5.64
4.	Bhishma lake, Gadag	-do-	2.50
5.	Lal Bagh, Bangalore	-do-	1.66
6.	Channapatna lake, Hasan	-do-	4.97
7.	Sharanbhasveshwara lake, Gulbarga	-do-	4.89
8.	Akkamahadevi lake, Haveri	-do-	2.64
9.	Kundawada lake, Davangere	-do-	3.41
10.	Kote Tavarekere lake, Chikmagalur	-do-	3.64
11.	Tripuranthkeshwar lake, Bidar	-do-	4.67
12.	Gowramma & Hambalmba	-do-	4.77
13.	Amanikere	-do-	13.37
14.	Banjara lake, Hyderabad	Andhra Pradesh	4.30

15.	Powai lake, Mumbai	Maharashtra	6.62
16.	Nine lakes in Thane	-do-	2.53
17.	Mahalaxmi lake, Vadagaon	-do-	1.85
18.	Rankala lake, Kolhapur	-do-	8.65
19.	Varhala Devi lake, Bhiwandi	-do-	4.60
20.	Sidheshwar	-do-	4.32
21.	Mansagar lake, Jaipur	Rajasthan	24.72
22.	Anasagar lake, Ajmer	-do-	15.28
23.	Pushkar	-do-	48.37
24.	Fatehsagar	-do-	41.86
25.	Pichola Lake, System, Udaipur	Rajasthan	84.75
26.	Ooty lake	Tamilnadu	1.75
27.	Kodaikanal lake, Dindigul	-do-	10.42
28.	3 lakes of Agartala	Tripura	2.02
29.	4 lakes in Nainital	Uttranchal	16.85
30.	Nainital lake, Nainital	-do-	47.97
31.	Rabindra Sarovar	West Bengal	6.96
32.	Mirik lake, Darjeeling	-do-	4.01
33.	Adi Ganga	-do-	24.94
34.	Dal lake, Sri Nagar	J&K	298.76
35.	Veli Akkulum lake, Thiruvananthpuram	Kerala	24.56
36.	Bindu Sagar lake, Bhubaneshwar	Orissa	3.50
37.	Rani talab, Rewa	Madhya Pradesh	3.31
38.	Sagar lake, Sagar	-do-	21.33
39.	Shivpuri Lakes (Jadav Sagar, Chandpatha), Shivpuri	-do-	51.99
40.	Mansi Ganga lake, Govardhan, Mathura	Uttar Pradesh	22.71
41.	Twin Lakes in Mokokchung	Nagaland	25.83
42.	Ramgarh Tal	Uttar Pradesh	124.32
43.	Nakki Lake	Rajasthan	7.33
44.	Sahib Bandh Lake	West Bengal	12.57
<b>Total</b>			<b>1028.16</b>

List of Projects completed during 2011-12

Environment Research Programme (ERP)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	A Sequential biological treatment to handle complex waste waters containing phenol, thiocyanate and ammonia-nitrogen.	Dr. Saswati Chakraborty, Department of Civil Engineering, IIT Guwahati.
2.	Development of Bipolar Membrane Technology for water purification and salt recovery as their corresponding acid and base from industrial effluent.	Dr. Vinod K. Shahi, Central Salt & Marine Chemicals Research Institute, Bhavnagar-364002, Gujarat.
3.	Development of Luminescence-based Biosensors for Detection of Mercury Ions in Water Bodies.	Dr. Arif Ali, Department of Biosciences Faculty of Natural Sciences, Jamia Millia Islamia, Maulana Mohammed Ali Jauhar Marg, New Delhi-110025, Delhi.
4.	Development of a reporter strain to monitor toxic and or Carcinogenic polycyclic aromatic hydrocarbons (PAHs) in the environment.	Dr. T.K.Datta, Department of Microbiology, Bose Institute, P-1/12 CIT Scheme VIIM, Kolkatta-700054, West Bengal.
5.	Pesticide degradation using cultural and biological tools to minimize ground water pollution.	Dr. Anjana Srivastava, Department of Chemistry, College of Basic Science & Humanities, G.B. Pant University of Agriculture & Technology, Pantnagar -263145, Uttarakhand.
6.	Assessment of environmental quality with respect of chemical and radiological contamination in the vicinity of thermal power plants in Delhi.	Dr. P S Khillare, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067.
7.	Bioremediation of polycyclic aromatic hydrocarbons (Pyrene).	Dr. Sunita Suneja, Department of Microbiology, CCS Haryana Agricultural University, Hisar-125004, Haryana.
8.	Controlled catalytic systems: A Viable option for development of cleaner chemical process.	Dr. Subratnath Koner, Department of Chemistry, Jadavpur University, Kolkata-700032, West Bengal.
9.	Removal of multimetal pollution from industrial waste streams and natural aquifer system by macrocycle functionalized dendrimers in the presence of organophilic coligands.	Dr. V.Alexander, Department of Chemistry, Loyola College, Chennai-600034, Tamil Nadu.

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| 10. | Noble metal capped semiconductor nanoparticles in the photocatalytic treatment of textile waste water.                                      | Dr. T. Shivakumar, Department of Chemical Engineering, Anna University, Chennai-600025, Tamil Nadu.   |
| 11. | Studies on synthesis of valuable chemicals via an environment friendly route using ionic liquids and enzymes.                               | Dr. S.Muthusamy, School of Chemistry, Bharathidasan University, Tiruchirappalli - 620024, Tamil Nadu.   |
| 12. | Impact assessment of environmental hazards caused by slaughterhouse wastes and control of pollution by recycling the wastes as animal feed. | Prof. Tapan Kumar Ghosh, Department of Animal Nutrition, West Bengal University of Animal & Fishery Sciences, 37, Kshudiram Bose Sarani, Kolkata - 700037, West Bengal. |
| 13. | Isolation and characterization of Actinomycetes and analysis of their antibacterial potential.  | Dr. Rup Lal, Department of Zoology, Delhi University, Delhi-110007, Delhi.  |
| 14. | Effect of coastal water quality on the corrosion and bio fouling characteristics of marine engineering alloys.                              | Dr. G. Subramanian, Scientist Central Electrochemical Research Institute Karaikudi-630006, Tamil Nadu.  |
| 15. | Destruction of volatile organic compounds (vocs) over perovskite-type compounds: Development of a catalytic oxidation device.               | Dr. K.M.Parida, Institute of Minerals & Materials Technology, Bhubaneshwar -751013, Odisha.   |
| 16. | Effects of O <sub>3</sub> on selected crop plants under ambient and elevated condition using ethylene diurea (EDU).                         | Dr. S.B.Agarwal, Department of Botany, Banaras Hindu University, Varanasi-221005, U.P.  |
| 17. | Isolation and identification of microbes for composting of degradable plastic waste.  | Dr. S.B.Gupta, Department of Microbiology, Indira Gandhi Krishi Vishwavidalaya, Raipur - 492006, Chhattisgarh.  |

**Eastern and Western Ghats Research Programme (E&WGRP)**

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Ecology of Plant Galls in the Shola Forests of Eastern and Western Ghats of Tamil Nadu	Dr. S. Amerjothy, Deptt. of Plant Biology and Plant Biotechnology, Presidency College, Chennai- 600 005

**National Natural Resource Management System (NNRMS) Programme**

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	National Wetland Inventory & Assessment	Dr. (Mrs.) Sushma Panigrahy, Space Application Centre, Indian Space Research Organization, Ahmedabad-380015.

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| 2. | Assessment and Evaluation of Seagrass Resources of India in two Oceanic Island group (Andaman and Nicobar and Lakshdweep), through conventional ground surveys and Satellite Remote Sensing                                       | Dr. T. Thanngaradjou, Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai, TamilNadu-608502.   |
| 3. | To Develop A Protected Area Management Information Management in Namdapha National park, Mouling National Park, Mehao Sanctuary and D'Ering Memorial Wildlife Sanctuary - Arunachal Pradesh using Remote Sensing & GIS Technology | Dr. G. Areendran, Director, Indira Gandhi Conservation Monitoring Center, WWF - India, 172-B Lodhi Estate, New Delhi- 110003.  |
| 4. | Exploration, diversity, and mapping of vegetation in the urban forests of Kumaun Himalayan towns using Remote Sensing & GIS   | Dr. Subrat Sharma, Centre for Remote Sensing and Geo-informatics, G.B. Pant Institute of Himalayan Environment & Development, Kosi-Katarmal, Almora - 263643, Uttarakhand. |

### Biosphere Reserves

Sl. No.	Title of the Project	Name of Organization
1.	Studies on Floral Diversity of Nokrek Biosphere Reserve, Meghalaya.	Botanical Survey of India, Eastern Regional Centre, Woodlands, Laitumkrah, Shillong, Meghalaya.
2.	Integrating Marine Ornamental Fish conservation and sustainable Development, Captive Breeding, Technology Popularization and Sea Ranching in Gulf of Mannar Biosphere Reserve.	Annamalai University, Parangipettai, Tamil Nadu.

## National River Conservation Plan States

Nodal Department	Nodal Implementing Agency
<p><b>1. Andhra Pradesh</b> Secretary, Municipal Administration &amp; U.D. Development, Govt. of Andhra Pradesh, A.P. Secretariat, Hyderabad-500 022 Tel+Fax- 040-23450622</p>	<p>Engineer-in Chief, Public Health Engg. Department, A.C.Guards, Hyderabad-500004 Phone: 040-23391208 Fax: 040-23393371</p> <p>Managing Director, Hyderabad Metropolitan Water Supply &amp; Sewerage Board, Khairtabad, Hyderabad -500 004 Phone: 040-23442844 Fax: 23442855</p>
<p><b>2. Bihar</b> Principal Secretary, Deptt. of Urban Development, Govt. of Bihar, Vikas Bhawan, Patna-800 015. Phone: 0612-2223580(O) Fax: 2223059</p>	<p>Managing Director, Bihar Urban Infrastructure Dev. Corp. (BUIDCO) 303, 3rd Floor, Maurya Tower, Maurya Lok Complex, Budh Marg, Patna, Bihar-800 001 Fax- 0612-2210103, 2210100</p>
<p><b>3. Goa</b> Director/Joint Secretary, Deptt. Of Science, Technology &amp; Environment, Govt of Goa, opp. Saligao Seminary, P.O-Saligao Bardez, Panaji-403 511 Tel./Fax.- 0832-24152201(O)</p>	
<p><b>4. Gujarat</b> Principal Secretary, U.D. &amp; Urban Housing Department, Sachivalaya, 9th floor, Block no-14 Gandhi Nagar, Gujarat-382 010 Phone : 079-23251001 Fax: 079-23251005</p>	<p>Municipal Commissioner, Ahmedabad Municipal Corporation, Ahmedabad-380 001. Phone: 079- 25352828 Fax: 079-25354638</p>

Nodal Department	Nodal Implementing Agency
<p><b>5. Haryana</b>                      Fin. Commissioner &amp; Pr. Secretary,                      Public Health Engineering Deptt,                      Govt. of Haryana Civil Sectt.,                      Chandigarh.                      Tel./Fax.- 0172-2704453 (O)</p>	<p>Engineer-in-Chief                      Public Health Engineering Deptt,                      Govt. of Haryana                      Bay No. 13-18 Sector-4, Panchkula, Haryana                      Fax: 0172-2561673, 2560270                      Tel. 0172-2561672</p>
<p><b>6. Jharkhand</b>                      Secretary,                      Deptt. Of Urban Development,                      Govt. of Jharkhand,                      Project Building, Dhurwa, 4th floor,                      Ranchi.-834004                      Phone: 0651-2403961(O)                      Fax: 0651-2400966</p>	<p>Managing Director,                      Greater Ranchi Development Agency,                      3rd Floor, Pragati Sadan (RRDA Building)                      Katchery Chowk,                      Ranchi-834001                      Tel: 0651-2200280/2200599/2200192                      Fax: 0651-2200212</p>
<p>Director                      Municipal Administration                      Govt of Jharkhand                      3rd Floor, Project Building                      Dhurwa, Ranchi-834004                      Fax- 0651-2400966/2400961</p>	
<p><b>7. Karnataka</b>                      Principal Secretary (Env)                      Govt. of Karnataka                      Bangalore</p>	<p>For Core Scheme:                      i) Chairman &amp; Managing Director,                      Bangalore Water Supply &amp;                      Drainage Board,                      KHB Complex, Cauvery Bhawan,                      K.G. Road, Bangalore-560 009.                      Fax: 080-2217743(O)/6686855 (R)                      Phone: 080-2217743/2230080</p> <p>For Non-core Scheme:                      ii) Member Secretary, Kr S.P.C.B.,                      6, 7, 8 &amp; 9th floor, Public Utility Building,                      M.G. Road, Bangalore-560 001                      Karnataka.</p> <p>The Managing Director                      Karnataka Urban Water Supply &amp;                      Drainage Board,                      Jalbhavan 1st stage, 1st phase,                      BTM Layout, Bannerghatta Road,                      Bangalore-560029                      Phone: 080-41106504 Fax: 080-26539206</p>

Nodal Department	Nodal Implementing Agency
<p><b>8. Kerala</b> Principal Secretary Water Resources (Irrigation) Deptt, Public Officer Building Government of Kerala, Thiruvananthapuram- 695033 Tel: 0471-2324394 Fax: 0471-2324394</p>	
<p><b>9. Madhya Pradesh</b> Principal Secretary, Housing and Environment Department, Govt. of Madhya Pradesh, Vallabh Bhawan, Bhopal-462 004</p>	<p>i) Member Secretary, M.P. Pollution Control Board, Paryavaran Parisar, E-5, Arera Colony, Bhopal-462 013 Phone: 564428 Fax: 0755-2463742, 0755-2462136</p>
<p>Chief Secretary, Govt. of Madhya Pradesh Bhopal</p>	<p>ii) E-N-C, PHED, Govt. of M.P. Satpura Bhawan Bhopal. Phone: 2561260, 2566990</p>
<p>Principal Secretary, Housing and Environment Deptt. Govt. of Madhya Pradesh, Paryavaran Parisar, E-5, Arera Colony Bhopal-462016 Phone: 0755-466859/2460189/ 2427004 Fax: 0755-2462136</p>	<p>iii) Executive Director, Environment Planning &amp; Coordination Organization (EPCO) Paryavaran Bhawan, E-5, Area Colony, Bhopal-462016 Fax: 0755-2462136</p>
<p><b>10. Maharashtra</b> Principal Secretary, 15th Floor, New Admn Building, Environment Department, Govt. of Maharashtra, Mantralaya, Madam Cama Road, Mumbai-400 032 Phone: 022-22793132 Fax : 022-22813947</p>	<p>Member Secretary, Maharashtra Jeevan Pradhikaran (MJP) 4th floor, Express Tower, Nariman Point, Maharashtra Phone: 022-22025354(O) Fax: 022-22029348</p>

Nodal Department	Nodal Implementing Agency
	Municipal Commissioner, Nasik Municipal Corporation Nasik, Maharashtra Phone: 0253-2578206 (O) Fax: 2577936
<p><b>11. Nagaland</b> Addl. Chief Secretary, Govt. of Nagaland, Kohima, Fax: 0370-2290470</p>	Environment Department Govt. of Manipur Imphal, No. 09862050668
<p><b>12. NCT of Delhi</b> Chief Secretary Govt. of NCT of Delhi Delhi Secretariat IP Estate, New Delhi-1100 02</p>	Chief Executive Officer, Delhi Jal Board, Varunalaya Phase-II, Jhandewalan, Delhi-110 005. Phone: 23511658 Fax: 23516182
Principal Secretary(UD), Govt. of NCT of Delhi, Delhi Secretariat IP Estate, New Delhi.-110 002 Phone: 23392167 Fax: 23392253	Additional Commissioner (Eng. DEMS&IT) Municipal Corporation of Delhi, I.P. Estate, New Delhi-110 002 Phone: 23370571,23379983(O) Fax: 23370965/23370281
Secretary (Environment), Govt. of NCT of Delhi, Delhi Secretariat, IP Estate New Delhi. Fax: 23392034/23392102	Commissioner, Municipal Corporation of Delhi Town Hall Chandni Chowk Delhi-110 006 Phone: 23961012, 23967315 Fax: 23965016/23392102
	Adviser (E&F) Planning Commission, Yojna Bhawan, New Delhi - 110 001. Phone: 23096536, 23096666/2300
Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, CBD Shahadra, Delhi - 110 032 Phone: 22304948 (O)	

Nodal Department	Nodal Implementing Agency
<p>Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, CBD Shahadra, Delhi- 110032 Phone: 22307078(O)</p>	
<p><b>13. Odisha</b> Commissioner cum Secretary, Housing &amp; Urban Development, Govt. of Orissa, Civil Secretariat, Bhubaneshwar-751 001. Phone: 2536903 Fax: 2394984</p>	<p>Member Secretary Orissa Water Supply and Sewerage Board, Satya Nagar, Bhubaneshwar. Phone: 0674-2571185 (O) Fax: 2571348</p>
<p><b>14. Punjab</b> Principal Secretary, Department of Local Govt. Govt. of Punjab, Punjab Civil Secretariat, Chandigarh</p>	<p>Managing Director, Punjab Water Supply &amp; Sewerage Board, Plot I-B, Sector-27A, Madhya Marg Chandigarh Phone: 0172-2651164(O) Telefax: 0172-2656526 E-mail: pwssbchd@hotmail.com</p>
<p><b>15. Rajasthan</b> Secretary, Local Self Govt. Deptt., Govt. of Rajasthan, Secretariat, Jaipur-5 Fax: 0141-2227744</p>	<p>(i) Chief Engineer (SP) Public Health Engg. Department, Govt. of Rajasthan, F-18, New Building, 1st Floor, 2, Civil Lines, Jaipur-302006 Fax: 0141-2222585 / 2220553</p> <p>(ii) Project Director, RUIDP Govt. of Rajasthan, AVS Building, Jawahar Circle, Jawaharlal Nehru Marg, Jaipur-17 Fax: 0141-2721919</p>
<p><b>16. Sikkim</b> PCE-cum-Secretary, Govt. of Sikkim, Water Security &amp; PHED, Nirman Bhawan, Gangtok-737101 Tele/Fax: 03592-202671</p>	

Nodal Department	Nodal Implementing Agency
<p><b>17. Tamil Nadu</b> Principal Secretary (Env. &amp; Forests), Govt. of Tamil Nadu, Secretariat, Fort St. George, Chennai-600 009 Phone: 044-25671511 Fax: 044-25670560</p>	<p>Member Secretary (EMAT), G F, Panagal Building, No.1 Jeenis Road, Saidapet, Chennai-600 015. Phone: 044-24336421(O) Fax: 044-24336594 ®</p>
<p>Principal Secretary M.A. &amp; W.S. Department Govt. of Tamil Nadu, Secretariat, Fort St. George, Chennai-600 009 Phone: 044-25670491 Fax: 044-25679866</p>	<p>Managing Director, CMWSSB, No-1, Pumping Station Road, Chintadripet, Chennai-600 002 Phone: 044-28549000 Fax: 044-28419643</p>
	<p>Managing Director, TWAD Board No. 32, Kamarajar, Chepauk, Chennai-600 005 Phone: 044-25670491(O) Fax: 044-25679866</p>
	<p>Commissioner of Municipal Administration, Ezhilagam, Annexe Building, VIth Floor, Chepauk, Chennai -600 005 Phone: 044-28513259 Fax: 044-28518079</p>
<p><b>18. Uttar Pradesh</b> Principal Secretary, Department of Urban Development, Govt. of U.P., Babu Bhawan, Secretariat, Lucknow - 226 001 Phone: 0522-2237314(O) Fax: 0522-2235241</p>	<p>Managing Director, U.P. Jal Nigam, 6, Rana Pratap Marg, Lucknow (UP) Phone: 0522-2626497 Fax: 0522-2622389, 2626360</p>
<p>Chief Secretary, Govt. of Uttar Pradesh Vidhan Bhawan, Lucknow, UP</p>	

Nodal Department	Nodal Implementing Agency
<p><b>19. Uttarakhand</b> Principal Secretary, (Peyjal) Govt. of Uttarakhand, Dehradun Secretariat, 4 Subhash Road, Uttarakhand Fax: 0135- 2712114/2712922</p>	<p>Managing Director Uttaranchal Peyjal Sansadhan Vikas Evam Nirman Nigam, 11, Mohini Road, Dehradun Phone: 0135-2676812 (O) Fax: 0135-2672337</p>
<p><b>20. West Bengal</b> <i>For NRCP</i> Principal Secretary Department of Environment Writers Building G-Block, 2nd Floor, Kolkata-700001 Phone: 033-22145592 (O) Fax: 22141271</p>	<p>Chief Executive Officer, KMDA, Prashasan Bhawan, DD-I, Sector-I, Kolkata-700 064 Phone: 033-23597915/7988 Fax: 033-23597881/23593563</p>
<p><i>For CETP</i> Addl. Chief Secretary, Commerce &amp; Industries Department, Govt. of West Bengal, Kolkata-700 006 Phone: 033-22820791 Fax: 033-22820790</p>	<p>Director of Industries, Commerce &amp; Industries Dept. Govt. of West Bengal, 4 Camac Street, Kolkata - 700 016 Fax: 033 - 22820790</p>
<p><b>21. Jammu &amp; Kashmir</b> Smt. Naseem Lanker Secretary Housing &amp; Urban Development Govt. of J&amp;K Sri Nagar</p>	<p>Shri Irfan Yaseen Vice Chairman, J&amp;K Lakes and Waterways Authority Development Wali's House, Braine Nishant, Srinagar (J&amp;K) Fax: 0194-2464015/16</p>

**List of wetlands of International Importance from India under Ramsar Convention**

S.No.	Name of Wetland	State	Date of declaration
1.	Chandratal	H.P.	08/11/05
2.	Renuka	H.P.	08/11/05
3.	Rudrasagar	Tripura	08/11/05
4.	Uppar Ganga	U.P.	08/11/05
5.	Hokarsar	J&K	08/11/05
6.	Surinsar - Mansar	J&K	08/11/05
7.	Bhitarkanika Mangroves	Orissa	19/08/02
8.	Bhoj Wetland	Madhya Pradesh	19/08/02
9.	Deepor Beel	Assam	19/08/02
10.	East Calcutta Wetlands	West Bengal	19/08/02
11.	Kolleru Lake	Andhra Pradesh	19/08/02
12.	Sasthamkotta Lake	Kerala	19/08/02
13.	Ashtamudi	Kerala	19/08/02
14.	Tsomorari	Jammu & Kashmir	19/08/02
15.	Vembanad-Kol Wetland	Kerala	19/08/02
16.	Point Calimere Sanctuary	Tamil Nadu	19/08/02
17.	Pong Dam Lake	Himachal Pradesh	19/08/02
18.	Kanjli	Punjab	22/01/02
19.	Ropar	Punjab	22/01/02
20.	Harike Lake	Punjab	23/03/90
21.	Loktak Lake <sup>MR</sup>	Manipur	23/03/90
22.	Sambhar Lake	Rajasthan	23/03/90
23.	Wular Lake	Jammu & Kashmir	23/03/90
24.	Chilika Lake	Orissa	01/10/81
25.	Keoladeo National Park <sup>MR</sup>	Rajasthan	01/10/81

MR - Montreux Record

**List of Wetlands Identified under  
National Wetland Conservation Programme**

S.No.	State/UT	S.No.	Name of Wetlands
1.	Andhra Pradesh	1.	Kolleru
2.	Assam	2.	Deepar Beel
		3.	Urpad Beel
		4.	Sone Beel
3.	Bihar	5.	Kabar
		6.	Barilla
		7.	Kusheshwar Asthan
4.	Gujarat	8.	Nalsarovar
		9.	Great Rann of Kachh
		10.	Thol Bird Sanctuary
		11.	Khijadiya Bird Sanctuary
		12.	Little Rann of Kachh
		13.	Pariej
		14.	Wadhvana
		15.	Nanikakrad
5.	Haryana	16.	Sultanpur
		17.	Bhindawas
6.	Himachal Pradesh	18.	Renuka
		19.	Pong Dam
		20.	Chandratal
		21.	Rewalsar
		22.	Khajjiar
7.	Jammu & Kashmir	23.	Wullar
		24.	Tso Morari
		25.	Tisgul Tso & Chisul Marshes
		26.	Hokersar

S.No.	State/UT	S.No.	Name of Wetlands
		27.	Mansar-Surinsar
		28.	Ranjitsagar
		29.	Pangong Tsar
		30.	Gharana
		31.	Hygam
		32.	Mirgund
		33.	Shalbugh
		34.	Chushul & Hanley
8.	Jharkhand	35.	Udhwa
		36.	Tilaiya Dam
9.	Karnataka	37.	Magadhi
		38.	Gudavi Bird Sanctuary
		39.	Bonal
		40.	Hidkal & Ghataprabha
		41.	Heggeri
		42.	Ranganthittu
		43.	K.G. Koppa wetland
10.	Kerala	44.	Ashtamudi
		45.	Sasthamkotta
		46.	Kottuli
		47.	Kadulandi
		48.	Vembnad Kol
11	Madhya Pradesh	49.	Barna
		50.	Yashwant Sagar
		51.	Wetland of Ken River
		52.	National Chambal Sanctuary
		53.	Ghatigaon
		54.	Ratapani
		55.	Denwa Tawa wetland
		56.	Kanha Tiger Reserve

S.No.	State/UT	S.No.	Name of Wetlands
		57.	Pench Tiger Reserve
		58.	Sakhyasagar
		59.	Dihaila
		60.	Govindsagar
		61.	Sirpur
12.	Maharashtra	62.	Ujni
		63.	Jayakawadi
		64.	Nalganga wetland
13.	Manipur	65.	Loktak
14.	Mizoram	66.	Tamdil
		67.	Palak
15.	Orissa	68.	Chilka
		69.	Kuanria wetland
		70.	Kanjia wetland
		71.	Daha wetland
		72.	Anusupa
16.	Puducherry	73.	Ousteri lake
17.	Punjab	74.	Harike
		75.	Ropar
		76.	Kanjli
		77.	Nangal
18.	Rajasthan	78.	Sambhar
19.	Sikkim	79.	Khechuperi Holy Lake
		80.	Tamze Wetland
		81.	Tembao Wetland Complex
		82.	Phendang Wetland Complex
		83.	Gurudokmar Wetland
		84.	Tsomgo wetland
20.	Tamil Nadu	85.	Point Calimer
		86.	Kaliveli

S.No.	State/UT	S.No.	Name of Wetlands
		87.	Pallaikarni
21.	Tripura	88.	Rudrasagar
		89.	Gumti reservoir
22.	Uttar Pradesh.	90.	Nawabganj
		91.	Sandi
		92.	Lakh Bahoshi
		93.	Samaspur
		94.	Alwara Wetland
		95.	Semarai Lake
		96.	Nagaria lake
		97.	Keetham Lake
		98.	Shekha wetland
		99.	Saman Bird Sanctuary
		100.	Sarsai Nawar
		101.	Patna Bird Sanctuary
		102.	Chandotal
		103.	Tal Bhaghel
		104.	Taal Ganbhirvan & Taal Salona
		105.	Aadi Jal Jeev Jheel
23.	Uttarakhand	106.	Ban Ganga Jhilmil Tal
		107.	Asan
24.	West Bengal	108.	East Calcutta Wetland
		109.	Sunderbans
		110.	Ahiron Beel
		111.	Rasik Beel
		112.	Santragachi
		113.	Patlakhawa- Rasomati
25.	Meghalaya	114.	Umiam lake
26.	UT (Chandigarh)	115.	Sukhna lake

## Names of Nodal Agencies of NGC Programme

S.No.	State/UT	State Nodal Agency
1	Andhra Pradesh	Directorate of NGC, Deptt. of Environment, Forests, Science & Tech., Govt. of A.P., No. 18, A-Block, Buddha Bhavan Complex, MG Road, Hyderabad - 500 003
2	Andaman & Nicobar (U.T.)	H. Q. Circle, Department of Forests, Vansadan, Haddo, Port Blair - 741002
3	Arunachal Pradesh	Arunachal Pradesh Pollution Control Board, Department of Environment & Forests, PCCF's Office 'Zero Point' Tiniali, Itanagar, Arunachal Pradesh-791111.
4	Assam	Assam Science, Technology and Environment Council, Vigyan Bhawan, G. S. Road, Guwahati - 781 005
5	Bihar	Bihar State Poll. Control Board, Beltron Bhawan, 2nd floor, Lal Bahadur Shastri Nagar, Patna - 800 023
6	Chandigarh (UT)	Department of Environment, Chandigarh Administration, Additional Town Hall Building, IInd Floor, Sector -17-, Chandigarh -160 017
7	Chhattisgarh	Chhattisgarh Environment Conservation Board, Nanak Niwas, Civil Lines, Raipur - 492 001
8	Dadra & Nagar Haveli (UT)	Pollution Control Committee (PCC), DNH, Silvassa - 396230
9	Daman& Diu (UT)	Pollution Control Committee, Fort Area, Daman & Diu, Moti Daman - 396 220
10	Delhi (NCT)	Eco Club Society of Delhi, Department of Environment, Govt. of NCT of Delhi, Level -6, C-Wing, Delhi Secretariat, I.P Estate, New Delhi - 110 002
11	Goa	Goa State Council of Science, Technology & Environment, Opp. Saligao Seminary, Saligao, Barcez, Goa - 403 511
12	Gujarat	Gujarat Ecological Education and Research Foundation (GEER), Near Indroda Nature Park, Sec. - 9, Gandhi Nagar - 382 009
13	Haryana	Haryana State Pollution Control Board, Plot No. C-11, Sector -6, Panchkula -134 101

## Ministry of Environment & Forests

S.No.	State/UT	State Nodal Agency
14	Himachal Pradesh	State Council for Science, Technology & Environment, 34, SDA Complex, Kasumpti, Shimla -171 009
15	Jammu & Kashmir	(May to Oct) Srinagar- Sheikh-ul Alam Campus, Rajbagh behind Govt Silk Factory, Srinagar- Kashmir (Nov to April) J & K State Pollution Control Board Jammu- Parivesh Bhawan, Glandni Transport Nagar (Narwal) Jammu
16	Jharkhand	Jharkhand State Pollution Control Board, T. A. Division Building, Ground Floor, H. E. C., Dhurwa, Ranchi - 834 004
17	Karnataka	Environmental Management & Policy Research Institute, Department of Forests, Ecology and Environment, Government of Karnataka, "Hasiru Bhavana", Doresanipalya Forest Campus, Vinayakanagar Circle, J. P. Nagar, 5th Phase, Bangalore - 560 078
18	Kerala	Kerala State Council for Science, Tech. & Environment, Shashtra Bhawan, Pattom, Thiruvannthapuram-695 004
19	Lakshadweep (UT)	Deptt. of Environment and Forests, UT Administration of Lakshadweep, Kavaratti - 682555
20	Madhya Pradesh	Environment Planning and Coordination Organisation (EPCO), Kachnar, Parayavaran Parisar, E-5, Sector, Arera Colony, Bhopal - 462 106
21	Maharashtra	Maharashtra Ekatmik Padik Jamin Vikas Yantrana, Directorate of Social Forestry, Maharashtra State, Central Administrative Building, Ground Floor, Pune - 411 001
22	Manipur	Manipur Pollution Control Board, Lamphelpat, Near Imphal West D.C. Office Complex, Imphal-795004
23	Meghalaya	Forests & Environment Department, Sylvan House, Lower Lauchumere, Shillong - 793 001
24	Mizoram	Mizoram State Pollution Control Board, MG Road, Khatla, Aizawl - 796 001
25	Nagaland	Nagaland Pollution Control Board, Signal Point, Dimapur -797112
26	Orissa	Centre for Environmental Studies (CES), Forests & Environment Department, Govt. of Orissa, N-1/247, IRC Village, Nayapalli, Bhubaneswar - 751 015

<b>S.No.</b>	<b>State/UT</b>	<b>State Nodal Agency</b>
27	Pudducherry (UT)	Environment Education Cell, State Training Centre, Perunthalivar Kamaraj Education Complex, 'B' Block, IV Floor, Anna Nagar, Puducherry - 605 005
28	Punjab	Punjab State Council for Science and Technology, Adjacent Sacred Heart School, Sector - 26, Post Box No. 727, Chandigarh - 160019
29	Rajasthan	Rajasthan Rajya Bharat Scouts & Guides, Rajya Mukhyalaya, Jawahar Lal Nehru Marg, Bajaj Nagar, Jaipur - 302 015
30	Sikkim	Department of Forests, Environment & Wildlife Management, Deorali, Gangtok -737 101, Sikkim
31	Tamil Nadu	Environment Management Agency of Tamil Nadu (EMAT), Govt. of Tamil Nadu, Ground Floor, Panagal Building, No. 1, Jeenis Road, Saidapet, Chennai - 600 015
32	Tripura	Tripura State Pollution Control Board, Vigyan Bhawan, Pt. Nehru Complex, Gorkha Basti, P.O. Kunjaban, Agartala, Tripura (W) - 799 006
33	Uttar Pradesh	Uttar Pradesh Pollution Control Board, PICUP Bhawan, 3rd Floor, B-Block, Gomati Nagar, Vibhuti Khand, Lucknow-226010
34	Uttarakhand	Uttarakhand Sabhi Ke Liye Shiksha Parishad (SSA), State Project Office, Nanoor Kheda, Tapovan Marg, Dehradun - 248 001
35	West Bengal	West Bengal Pollution Control Board, Department of Environment, Government of West Bengal, Paribesh Bhawan, 10A, Block - LA, Sector III, Salt Lake City, Kolkata - 700 098.

List of RRAs under NEAC

S.No.	Name of Organisations	Area of Jurisdiction
1.	Sri Swarupa Nistha Ashrama, Philosophical Welfare Society, H.No. 1-1189-99,1st Floor, N.G.O. Colony, Kadiri-515591, Anathapur Distt. Andhra Pradesh	Andhra Pradesh (South)
2.	Deccan Development Society, 101, Kishan Residency House No.1-11-242/1, Street No.5, Begum Pet, Hyderabad- 500 016	Andhra Pradesh (North)
3.	Assam Science Society, P.B.No.78, Lamb Road, Latasil, Guwahati-781 001	Assam
4.	Rural Youth Coordination Centre, Camp Office: House No. 210,Indira Nagar Rajapur, Post-Patna G.P.O., Distt-Patna-800 001 Head Office: At. Po. Distt. Saran, Bihar Pin-841401	Bihar
5.	Jan Kalyan Parishad, Moh. Namana Kala Ring Road, (Near Comel School), Ambikapur, Distt. -Surguja, Chattisgarh-497001	Chhattisgarh
6.	Indian Environmental Society, U-112, Vidhata House, 3rd Floor, Vikas Marg, Shakarpur, Delhi- 110 092 Branch Office: Kaveri Building, Ground Floor Sanjay Palace, Agra	Delhi & Western U.P.
7.	Vikram Sarabhai Centre for Development Interaction (VIKSAT), Nehru Foundation for Development, Taltej Tekra, Vastrapur Road, Ahmedabad- 380 054	Gujarat & Daman Diu
8.	Haryana Nav Yuvak Kala Sangam (HNYKS) 46, Sector-I, Rohtak-124001, Haryana	Haryana
9.	State Council for Science, Technology & Environment H.P. 34, SDA Complex, Kasumpti, Shimla-171 009	Himachal Pradesh
10.	World Wide Fund for Nature-India, Jammu & Kashmir State Office, C/O Centre for Environment Education & Training, New University campus, Jammu-180006	Jammu
11.	The NGOs Co-ordination Federation (J&K), Usman Complex Solina, Srinagar-190009 (J&K)	Kashmir including Ladakh

<b>S.No.</b>	<b>Name of Organisations</b>	<b>Area of Jurisdiction</b>
12.	Gram Vikas Kendra, K-3/57, Hans Stoehr Road, TELCO Colony, Jamshedpur-831 004	Jharkhand
13.	Karnataka Rajya Vijnana Parishat, Vijnana Bhawan, No. 24 /2 & 24/3, 21st Main Road, Banashankari-II Stage, Bangalore- 560 070	Karnataka
14.	Centre for Environment & Development, Thozhuvancode, Vattiyoorkavu P.O., Thiruvananthapuram, Kerala -695013	Kerala, Lakshadweep & Minicoy Island
15.	Bhartiya Agro-Industries Foundation (BAIF), Development Research Foundation, BAIF Bhawan, Dr. Manibhai Desai Nagar, National Highway No. 4, Warje, Pune- 411 058	Maharashtra, Goa & Dadar Nagar Haveli
16.	Environment & Ecology Wing, Deptt. of Environment and Forests, Government of Manipur, Porompat, Near D.C. Officer, Imphal (east)-795 001	Manipur
17.	Environmental Planning & Coordination Organisation (EPCO), 'Kachnar' Paryavaran Parisar, E-5, Arera Colony, Bhopal- 462 016	Madhya Pradesh
18.	Center for Environment Protection (CEP), B-27/1, Tuikual South, Aizwal-796001, Mizoram	Mizoram
19.	Nagaland Pollution Control Board, Signal Point, Dimapur, Nagaland-797112	Nagaland
20.	Centre for Environment Studies, Forests and Environment Department, Government of Orissa, N-3/56 I.R.C. Village, Bhubaneshwar- 751015	South Orissa
21.	Animal Welfare Society of Orissa, Branch Office: At/Po- Bhandaripokhari, Distt-Bhadrak, Orissa Head Office: Or. No. 4R-2, Unit-8 Gopbandhu Square, Bhubaneshwar - 751012	North Orissa
22.	Punjab State Council for Science & Technology, MG SIPA Building, Near Sacred Heart Public School, Sector-26, Chandigarh-160 019	Punjab & Chandigarh
23.	Consumer Unity & Trust Society (CUTS), D-217, Bhaskar Marg, Bani Park, Jaipur-302016, Rajasthan	Rajasthan

## Ministry of Environment & Forests

S.No.	Name of Organisations	Area of Jurisdiction
24.	C.P. Ramaswamy Aiyer Foundation, The grove, 1-Eldmas Road, Alwerpet, Chennai- 600 018	Tamilnadu (North) & Andaman Nicobar
25.	C.P. Ramaswamy Environment Education Centre, No. 1-A, Eldams Road, Chennai- 600 018	Pondicherry
26.	PEACE Trust, Near Police Colony, Trichy Road, Dindigul, Tamil Nadu-624005	Tamilnadu (South)
27.	Tripura State Pollution Control Board, Pandit Nehru Complex, Gorkhabasti, Agartala-799 006	Tripura
28.	Devoted Organization for Reforming Environment (DORE), 196-B, Khari Bazar, Ranikhet-263645, Uttranchal	Uttaranchal
29.	Shohratgarh Environmental Society, Prem Kunj, 9, Adarsh Colony, Shohratgarh, Siddharth Nagar Distt. 272 205 (U.P.)	Uttar Pradesh (East)
30.	School of Fundamental Research, 29, Pratapaditya Road, Kolkata- 700 026	West Bengal Except Darjeeling Hilly Areas and Siliguri
31.	Federation of Societies for Environmental Protection (FOSEP), Darjeeling, Dr. S.M. Das Road, Red Cross Building, Darjelling-734101, West Bengal	Darjeeling Hilly Area & Siliguri
32.	Department of Environment& Forests, Office of the PCCF & Prinl. Secry., 'P'-Sector, Government of Arunachal Pradesh, Itanagar-791111	Arunachal Pradesh
33.	Department of Environment, Government of Meghalaya, Shillong-793 001.	Meghalaya
34.	State Environment Agency Forest, Environment and Wildlife Management Department, Government of Sikkim, Gangtok-737 101	Sikkim

## List of ENVIS Centres

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
<b>ENVIS Institutional Centres (Subject Specific)</b>			
1.	Central Pollution Control Board (CPCB), Delhi	Shri G. Ganesh, ENVIS Coordinator Parivesh Bhawan, East Arjun Nagar, Delhi-110 032, Delhi Phone: 011-22301932, 43102258 Fax: 011-22304948, 22301932, 43102258 Email: cpcb-envi@nic.in URL: www.cpcbenviis.nic.in	Control of Pollution (Water, Air and Noise)
2.	Industrial Toxicological Research Centre (ITRC), Lucknow	Dr. K.C. Gupta, Director Shri Shailendra Kumar Gupta, ENVIS Coordinator Post Box No.80, Mahatma Gandhi Marg, Lucknow-226 001, Uttar Pradesh Phone:+91 522 2620206 (Ext. 308), 2620207 (Ext. 308), 2284591 Fax: +91 522 2628227,2628227,2611547 Email:itrc@envis.nic.in,envisiitr@envisiitr.org.in, director@iitrindia.org URL: url: www.itrcenvis.nic.in	Toxic Chemicals
3.	National Institute of Occupational Health (NIOH), Ahmedabad	Dr. P.K. Nag, Director Dr. Sunil Kumar, Scientist 'G' & ENVIS Coordinator Meghani Nagar, Ahmedabad, Gujarat-380016 Phone: 079-22686351,22686259, 22682868, 22688842 Coordinator : 09426395738 Fax: 079-22686361,22686110 Email: nioh@envis.nic.in,sunilnioh@yahoo.com URL: www.niohenvis.nic.in	Environmental and Occupational Health
4.	Centre for Ecological Sciences - Indian Institute of Science (IISc), Bengaluru	Prof. R. Sukumar, Chairman Dr. T.V. Ramachandran, ENVIS Coordinator Bengaluru, Karnataka-560 012, Bengaluru Phone: 91-080-22933099/23600985/ 91-080-22932506/23601428/23600085/ 91-080-23600683 Email: envis@ces.iisc.ernet.in, cestvr@ces.iisc.ernet.in URL: http://ces.iisc.ernet.in/biodiversity	Western Ghats Ecology and Biodiversity

**Ministry of Environment & Forests**

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
5.	Centre for Advanced Study in Marine Biology (CASMB), Parangipettai	Prof. Dr. T. Balasubramanian, Dean & Director and ENVIS In-Charge Annamalai University, Parangipettai-608502, Tamil Nadu Phone: 04144-243223, 243533, 253089, 09443330214 Fax: 04144- 243555/243641 Email: stbcas@nic.in, stbcas@gmail.com URL: casmbenvis.nic.in	Mangroves, Estuaries, Lagoons, Coral Reefs
6.	Zoological Survey of India (ZSI), Kolkata	Dr. K. Venkataraman, Director Dr. Achintya Chattopadhyay, ENVIS Coordinator Prani Vigyan Bhawan, M Block, New Alipore, Kolkata-700053, West Bengal Phone: 033-24008595, 24006893, 24003925, 24002360 (Extn. 292) Fax: 033-24006893, 24006893 Coordinator: 09339382386 Email: zsi@envis.nic.in, drachatto@yahoo.com URL: zsienvis.nic.in	Faunal Bio diversity
7.	Centre for Mining Environment (CME), Indian School of Mines, Dhanbad	Prof. D. C. Panigrahi, Director Dr. Asim Kumar Pal, Prof & ENVIS Coordinator Indian School of Mines, Dhanbad-826004, Jharkhand Phone: 0326-2296624/25, Coordinator: 09939160256 Fax: 0326-2296624, 2296603 Email: ism@envis.nic.in, palasim2003@yahoo.co.in	Environmental Problems of Mining
8.	National Environmental Engineering Research Institute (NEERI), Nagpur	Shri Prakash Kumbhare, ENVIS Coordinator Nehru Marg, Nagpur-440020, Maharashtra Phone: 0712-2226026, 2226071, 2249885 Fax: 0712-2225191, 2249782, 2249900 Email: neeri@envis.nic.in URL: neerienvis.nic.in	Hazardous Waste
9.	G.B. Pant Institute of Himalayan Environment and Development (GBPIHED), Almora	Dr. L.M.S. Palni, Director Dr. P.P. Dhyani, ENVIS Coordinator Kosi - Katarmal, Almora-263643, Uttarakhand, Phone: 05962-241041, 241153 (Extn.54), 241015 Coordinator: 09412092189, 09412092188, 09720335427	Himalayan Ecology

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
		Fax: 05962-241014/15, 241150, 241153 Email: gbpihed@envis.nic.in, himervis@gbpihed.nic.in, lmspalni@rediffmail.com, psdir@gbpihed.nic.in URL: gbpihed.nic.in	
10.	Botanical Survey of India (BSI), Kolkata	Dr. Paramjit Singh, Director, BSI Dr.P.Lakshminarasimhan, Project In-Charge, ENVIS CENTRE ENVIS Centre on Floral Diversity CNH Building, 3rd Floor, AJC Bose Indian Botanic Garden, P.O. Botanic garden, Howrah-711103, Kolkata, West Bengal Phone: 033-26683235, 26680667 Fax: 033-26686226 Email: bsi@envis.nic.in, bsi_headquarter@rediffmail.com, envis@cal2.vsnl.net.in URL: bsienvis.nic.in	Floral Biodiversity
11.	Forest Research Institute (FRI), Dehradun	Dr. S.S. Negi, IFS, Director Shri Shailendra Kaushik, ENVIS Coordinator National Forest Library & Information Centre, Indian Council of Forestry Research Education New forest - P.O., Dehradun-248006, Uttarakhand Phone: 0135-2756414 Fax: 0135-2756865 Email: fri@envis.nic.in, kaushikshail@yahoo.com, kaushiks@icfre.org URL: frienvis.nic.in	Forestry
12.	Wildlife Institute of India (WII), Dehradun	Dr. P.R. Sinha Director Dr. V.B. Mathur, ENVIS Coordinator PO Box NO. 18, Chandrabani, Dehradun-248001, Uttarakhand Phone: 0135-2040111-15 (Extn.202) Coordinator: 09412054648 Fax: 0135-2640117 Email: wii@envis.nic.in, envis@wii.gov.in, vbm@wii.gov.in, dean@wii.gov.in URL: wiienvis.nic.in	Wildlife and Protected Area Management
13.	State Council of Science and Technology for Sikkim (SCSTS), Gangtok	Shri A.K. Srivastava, IAS, Secretary, Dept. of Science & Technology Shri Dorji Thinlay Bhutia, ENVIS Coordinator Deorali, Gangtok-737 102, Sikkim	Eco-Tourism

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<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
		Phone: 03592-208940, 205551, Coordinator : 09434188242 Fax: 0359-2208764, 2228764 Email: scsts@envis.nic.in, dthinlay@hotmail.com, dthinlay@yahoo.co.in URL: scstsenvis.nic.in	
14.	Central Arid Zone Research Institute (CAZRI), Jodhpur	Dr. M.M. Roy, Director Shri Tirth Das, ENVIS Coordinator Dr. Raheja Library, Jodhpur-342 003, Rajasthan Phone: 291- 2786931 Coordinator: 09829586846 Fax: 291-788706 Email: cazri@envis.nic.in, tdas@cazri.res.in, rajeshk33@yahoo.co.in URL: cazrienvis.nic.in	Desertification
15.	Department of Zoology - University of Madras, Chennai	Prof. N. Munuswamy, Hon. Director and ENVIS Coordinator Life Science Building, Guindy Campus, Chennai-600 025, Tamil Nadu Phone: 044-22300899 Mobile: 09884171947, 09444895145 Fax: 044-22300899 Email: dzum@envis.nic.in, enviscoordinator@gmail.com, munuswamynm@yahoo.com URL: dzumenvis.nic.in	Micro-organisms and environmental management
16.	Institute for Ocean Management (IOM), Chennai	Prof. R. Ramesh, Director and ENVIS Coordinator Koodal Building, Anna University, Chennai-600 025, Tamil Nadu Phone: 044-22330108, 22200159, 22203408 Mobile: 9840966299 Fax: 044-22200158 Email: iom@envis.nic.in, rramesh_au@yahoo.com, ramesh@annauniv.edu URL: iomenvis.nic.in	Coastal Regulation Zone Management and Coastal Shelter Belts
17.	Indian Institute of Tropical Meteorology (IITM), Pune	Prof. B.N. Goswami, Director Dr. Gufran Beig , Scientist F & ENVIS Coordinator Dr. Homi Bhabha Road, Pashan,	Acid Rain and Atmospheric Pollution

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
		Pune-411 008, Maharashtra Phone: 020-25904200, 25893825 (Extn. 261, 212) Mobile: 09423018580 Fax: 020-25893825 Email: iitm@envis.nic.in, goswami@tropmet.res.in, beig@tropmet.res.in URL: iitmenvis.nic.in, envis.tropmet.res.in	
18.	Indian Institute of Chemical Technology (IICT), Hyderabad	Dr. J.S. Yadav, Director Dr. U.Suryanarayana Murthy, ENVIS Coordinator Habsiguda, Uppal Road, Hyderabad-500007, Andhra Pradesh Phone: 040-27193134 Fax: 040-27193227 Coordinator: +91-9440802794 Email: iict@envis.nic.in, usnmurty@iict.res.in URL: iictenvis.nic.in	Bioinformatics - Vector Control
19.	Central Building Research Institute (CBRI), Roorkee	Prof. S.K. Bhattacharya, Director Dr. L.P. Singh, ENVIS Coordinator Roorkee-247 667, Uttarakhand Phone: 01332-283442, 272391, 2722432 Mobile: Coordinator : 09837031050 Fax: 01332-272272, 272543 Email: cbri@envis.nic.in, lpsingh.cbri@nic.in, lpsingh@cbri.in URL: cbrienvis.nic.in	Fly Ash
20.	National Botanical Research Institute (NBRI), Lucknow	Dr. C.S. Nautiyal - Director Dr. Nandita Singh, ENVIS Coordinator Rana Pratap Marg, Lucknow-226 001, Uttar Pradesh Phone: 0522-2205847, 2205839, 2297931 Coordinator : 09415110314 Fax: 0522-2205847 Email: nbri@envis.nic.in, n.singh@nbri.res.in, nanditasingh8@yahoo.com URL: nbrienvis.nic.in	Indicators of Plant Pollution
21.	Gujarat Cleaner Production Centre (GCPC), Gandhi Nagar	Shri Bharat P. Jain, Member Secretary Ms. Neerja Desai, Coordinator Block No.4, 3rd Floor, Udyog Bhawan, Sector-11, Gandhi Nagar-382 017, Gujarat Phone: 079- 23244147 Fax: 079-23244306	Cleaner Production & Technology

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<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
		Coordinator : 09879277018 Email: gcpc@envis.nic.in, gcpc11@yahoo.com URL: gcpcgujarat.org/envis	
22.	Department of Environmental Sciences (DES), University of Kalyani, West Bengal	Prof. Alok Kumar Banerjee Prof. S.C. Santra, ENVIS Coordinator University of Kalyani, Kalyani Distt. Nadia West Bengal - 741235 Phone: 033-25808749 Fax: 033-25828282 Coordinator: 09433215100 Email: scsantra@yahoo.com, desku@envis.nic.in URL: deskuenvis.nic.in	Environmental Biotechnology
23.	School of Planning and Architecture (SPA), Delhi	Prof. A. K. Sharma, Director Prof. Meenakshi Dhote, ENVIS Coordinator 4 B, Block, Indraprastha Estate, New Delhi-110002 Phone: 011-23702393 Coordinator: 09313508547 Fax: 011-23702383 Email: spa-env@nic.in, m.dhote@spa.ac.in URL: spaenvis.nic.in	Human Settlement
24.	School of Environmental Sciences Jawaharlal Nehru University (JNU), Delhi	Shri Sandeep Chatterjee, Registrar Prof. Sudha Bhattacharya, Dean, School of Environmental Sciences, JNU & ENVIS Coordinator New Delhi-110 067, India Phone: 011-26704315 Fax: 26741502 Email: envis@mail.jnu.ac.in URL: jnuenvis.nic.in	Biogeochemistry
<b>ENVIS NGO Centres (Subject Specific)</b>			
25.	The Energy Resources Institute (TERI), Delhi	Dr. R.K. Pachauri, Director General Shri P.K. Bhattacharya, ENVIS Coordinator Darbari Seth Block, Habitat Centre, Lodi Road, New Delhi-110 003 Phone: 011-24682100,24682111,41504900 Coordinator: 9811873580 Fax: 011-246821 44/45 Email: teri@envis.nic.in, envis@teri.res.in, pkbhatta@teri.res.in URL: terienvis.nic.in	Renewable Energy and Environment

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
26.	World Wide Fund for Nature - India (WWF), Delhi	Shri Ravi Singh, Secretary General and CEO Shri G. Areendran, ENVIS Coordinator Indira Gandhi Conservation Monitoring Centre (IGCMC), 172-B, Lodhi Estate, New Delhi-110 003 Phone: 011-41504791, 41504793 Coordinator: 9968061056 Fax: 011-41504779, 24691226 Email: wwf@envis.nic.in, gareendran@wwfindia.net, ravisingh@wwfindia.net, rkumar@wwfindia.net URL: wwfenvis.nic.in	NGOs and Parliament
27.	Centre for Environment Education (CEE), Ahmedabad	Shri Kartikeya V. Sarabhai, Director Rajeswari N. Gorana, ENVIS Coordinator Nehru Foundation for Development, Taltej Tekra, Ahmedabad-380 054, Gujarat Phone: 079-26844795, 26858002-05, 26858011 Coordinator: 9825647784 Fax: 079-26858010 Email: rajeswari.namagiri@ceeindia.org cee@envis.nic.in, cee.envis@ceeindia.org URL: greenteacher.org	Environmental Education
28.	Environment Protection Training and Research Institute (EPTRI), Hyderabad	Shri Indrajit Pal, IAS, Director General Dr. Razia Sultana, Director and ENVIS Coordinator 91/4, Gachibowli, Hyderabad-500 032, Andhra Pradesh Phone: 040-2323180103, 23180114 Coordinator: 9848475506 Fax: 040-23180135 Email: eptri@envis.nic.in, razia@eptri.com URL: eptrienvis.nic.in	Ecology of Eastern Ghats
29.	Centre for Media Studies (CMS), Delhi	Dr. N. Baskara Rao, Chairman Shri Rohit Singh, ENVIS Coordinator Research House, B-34, Community Centre, Saket, New Delhi-110 017, Delhi Phone: 011-26851660, 26522255, 26522244 26856429 Coordinator: 09899979158 Fax: 011-26968282, 26968282 Email: cms@envis.nic.in, cmsenvis@cmsindia.org URL: cmsenvis.nic.in	Communication and Electronic Media

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<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
30.	Bombay Natural History Society (BNHS), Mumbai	Dr. Asad R. Rahmani, Director Hornbill House, Dr. Salim Ali Chowk, Saheed Bhagat Singh Road, Mumbai-400 001, Maharashtra Phone: 022-22821811 Fax: 022-22837615 Email: bnhs@envis.nic.in, bnhs@bom4.vsnl.net.in, envis@bnhs.org URL: bnhsenvis.nic.in	Avian Ecology
31.	Consumer Education and Research Centre (CERC), Ahmedabad	Shri Kalyan Bose, Hon. Director (Admn.) Ms Gauri Wagenaar, ENVIS Coordinator Suraksha Sankool, Thaltej, Sarkhej-Gandhinagar Highway, Ahmedabad-380 054, Gujarat Phone: 079-27489945-46, 27450528, 27451097 Fax: 079-27489947 Email: cerc@envis.nic.in, cerc@cercindia.org URL: enviscerc.org	Eco-Labeling and Eco-Friendly Products
32.	CPR Environmental Education Centre (CPREEC), Chennai	Dr.(Mrs.) Nanditha C, Krishna, Hon. Director Shri P.Sudhakar, ENVIS Coordinator 1, Eldams Road, Alwarpet, Chennai-600 018, Tamil Nadu Phone: 044-24346526, 24337023, 24341778 Coordinator: 094442 54831 Fax: 044-24320756 Email: cpreec@envis.nic.in, cpreec@vsnl.com, cpreec@gmail.com URL: cpreecenvis.nic.in	Conservation of Ecological Heritage and Sacred Sites in India
33.	Foundation for Revitalization of Local Health Traditions (FRLHT), Bengaluru	Dr. Padma Venkat, Director Ms. Suma TS, ENVIS Coordinator 74/2, Jarakbande Kaval, Yelahanka, via Attu PO, Bengaluru-560 064, Karnataka Phone: 080-28565847, 28568007, 28565873, 28568000 Coordinator: 09448937066 Fax: 080-28565895, 28567926 Email: frlht@envis.nic.in, envis@frlht.org, suma.tagadur@frlht.org URL: frlhtenvis.nic.in	Conservation of Medicinal Plants

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
34.	National Solid Waste Association of India (NSWAI), Mumbai	Dr. Amiya Kumar Sahu, President and ENVIS Coordinator, B-703, Customs Colony A, Marol, Military Road, Andheri (E), Mumbai - 400 059 Phone: 022-24375363, 29207577 Telefax: 022-29202951, 29202951 Email: nswai@envis.nic.in, econpcpl@gmail.com, sahu_amiya@rediffmail.com URL: nswai.com	Municipal Solid Waste Management
35.	International Institute of Health and Hygiene, Delhi	Dr. Namita Mathur, Head & ENVIS Coordinator Sulabh Bhawan, Mahavir Enclave, New Delhi-110 045, Delhi Phone: 011-25058941 Coordinator: 9810055105 Fax: 011-25034014 Email: sulabh@envis.nic.in URL: sulabhenvis.nic.in	Hygiene, Sanitation, Sewage Treatment Systems and Technology
36.	Indian Centre for Plastic in the Environment (ICPE), Mumbai	Shri K.G. Ramanathan, President Shri T.K. Bandopadhyay, ENVIS Coordinator OLYMPUS House, 2nd Floor, 25, Raghunath Dadaji Street, (Near Fort House - Formerly Handloom House), Fort, Mumbai - 400 001 Phone: 022-22617137, 22617165, 40022491 Fax: 022-22617168, 09323296499 Email: icpe@envis.nic.in, icpe@vsnl.net URL: icpeenvis.nic.in	Management of Plastic, Polymers and Biopolymers
37.	Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore	Dr. P.A. Azeez, Director Dr. Goldin Quadros, ENVIS Coordinator Anaikatty P.O., Coimbatore-641 108, Tamil Nadu Phone: 0422-2657101-102 Coordinator: 09869183412 Fax: 0422-2657088 Email: sacon@envis.nic.in, salimalicentre@gmail.com, salimali@vsnl.com URL: wetlandsofindia.org	Wetland Ecosystem (including inland wetlands)

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Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
38.	International Institute for Population Sciences (IIPS), Mumbai	Dr. F. Ram, Director Dr. R.B. Bhagat, ENVIS Coordinator Govandi Station Road, Deonar, Mumbai-400 088, Maharashtra Phone: 022-42372412, 42372473 Coordinator : 09869947264 Fax: 022-25563257 Email: iip@envis.nic.in, popenvis123@rediffmail.com, director@iips.net, rbbhagat@iips.net URL: iipsenvis.nic.in	Population, Human Settlement and Environment
39.	Indian Environmental Society (IES), Delhi	Dr. Desh Bandhu, President and ENVIS Coordinator Vidhata House, Vikas Marg, Shakarpur, Delhi-110092 Phone: 011-22046823,22450749 Coordinator: 9810180133 Fax: 011-22523311 Email: iesenro@vsnl.com, iesindia@gmail.com URL: iesenvis.nic.in	Role of Panchayats in Environment

### ENVIS Government Centres (State Government)

40.	Environment Protection Training and Research Institute (EPTRI), Hyderabad	Shri Indrajit Pal, IAS, Director General Dr. Razia Sultana, Director and ENVIS Coordinator 91/4, Gachibowli, Hyderabad-500 032, Andhra Pradesh Phone: 040-23180103, 23180114 Coordinator: 9848475506 Fax: 040-23180135 Email: ap@envis.nic.in, soeapri.eg@gmail.com, emailrazia@yahoo.com URL: apenvis.nic.in	Status of Environment and Related Issues
41.	Assam Science, Technology and Environmental Council, Guwahati	Dr. Satyendra Kumar Choudhury, Director Shri Jaideep Baruah, ENVIS Coordinator Bigyan Bhawan, G.S. Road, Guwahati-781005, Assam Phone: 0361-2464621/2464619 Mobile: 09435032706, 09435102089 Telefax: 0361-2464617 Email: asm@envis.nic.in, astec-asm@nic.in, nverma2000@gmail.com, j.baruah@nic.in URL: asmenvis.nic.in	Status of Environment and Related Issues

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
42.	Bihar State Pollution Control Board, Patna	Prof. Subhash Chandra Singh, Chairman Shri Anil Kumar, ENVIS Coordinator Beltron Bhawan, 2nd Floor, Lal Bhadur Shastri Nagar, Patna-800 023, Bihar Phone: 0612-2281250, 2291709, 2281050 Fax: 0612-2291709, 2281050 Email: bh@envis.nic.in URL: bhenvis.nic.in	Status of Environment and Related Issues
43.	Chhattisgarh Environment Conservation Board, Raipur	Shri Anil Kumar Sharma, Member Secretary Shri A.P. Savant, ENVIS Coordinator Nanak Niwas, Civil Lines, Raipur-492 001, Chhattisgarh Phone: 0771-2443934, 2425523 Fax: 0771-2443924, 2425585 Email: cht@envis.nic.in URL: enviscecb.org/links.htm	Status of Environment and Related Issues
44.	Department of Science, Technology and Environment, Goa	Dr. N.P.S. Varde, Director/Jt. Secy. (STE) Dr. Mohan R. Girap, ENVIS Coordinator Saligao Plateau, Saligao, Bardez-403511, Goa Phone: 0832-2407186, Fax: 0832-2407186 Email: goa@envis.nic.in, envisgoa@rediffmail.com, gscst2k@sancharnet.in, ste@goa.nic.in URL: goaenvis.nic.in	Status of Environment and Related Issues
45.	Gujarat Ecology Commission (GEC), Gandhinagar	Shri C.H. Pandya, Director Shri Nischal Joshi, Sr. Project Manager Block No.18/1, Udyog Bhavan, Sector-11, Gandhinagar-382017, Gujarat Phone: 079-23257658, 23257659 Coordinator: 09825030698 Fax: 079-23257656 Email: guj@envis.nic.in, gec_icef@rediffmail.com URL: gujenvfor.gswan.gov.in	Status of Environment and Related Issues
46.	State Council for Science, Technology and Environment (SCSTE), Shimla	Shri E. Vikram, IFS, Jt. Member Secretary(EC) Dr. Alka Sharma, ENVIS Coordinator B-34, SDA Complex, Kasumpti, Shimla-171 009, Himachal Pradesh Phone: 0177-2622490, 2620998, 2622923, 2633923 Coordinator - 09816462200 Fax: 0177-2620998 Email: hp@envis.nic.in URL: hpenvis.nic.in	Status of Environment and Related Issues

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<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
47.	Directorate of Environment and Remote Sensing, Srinagar (J&K)	Shri Ravi Kumar Kesar (IFS), Director Mrs. Mutaharra A W Deva, ENVIS Coordinator SDA Complex, Bemina, Srinagar Phone: 0194-2490823 Gladni Narwal Jammu May-Oct Phone: 0194-2490823, 2454847 Nov-Apr 0191-2490020 TeleFax: 0194-2490823 Email: jk@envis.nic.in, mutaharradeva@gmail.com, jkenviscentre@gmail.com URL: jkenvis.nic.in	Status of Environment and Related Issues
48.	Department of Forests, Jharkhand	Shri A. K. Singhi IFS, Principal Chief Conservator of Forests, Forests & Environment Department Shri A. K. Mishra, IFS. Addl. Principal Chief Conservator of Forests, Working Plan and Research Council, Doranda, Ranchi-834 002, Jharkhand Phone: 0651- 2482294 Coordinator: 9431140743, 9431707214 Fax: 0651-2480655 Email: jhar@envis.nic.in, akm_1954@yahoo.co.in URL: jharenvic.nic.in	Status of Environment and Related Issues
49.	Environment Management & Policy Institute (EMPRI), Bangaluru	Shri R.M.N. Sahai, IFS, Director General Shri K.H. Vinaya Kumar, IFS, ENVIS Coordinator Department of Forests, Environment and Ecology, Govt. of Karnataka, Hasiru Bhawan, Doresanipalya, Forest Campus, Vinayaka Nagar Circle, J.P. Nagar, 5th Phase, Bangaluru-560078, Karnataka Phone: 080-26490746, 26490747, 22254377, 22092445 Fax: 080-26490745, 22254377 Coordinator: 9611135140, 9916131360 Email: kar@envis.nic.in, empri_Bangaluru@yahoo.co.in, empri.envis@gmail.com, felix.nitz@cimonline.de URL: parisaramahiti.kar.nic.in	Status of Environment and Related Issues

Sl. No.	ENVIS Centre/ Organisation	Communication Linkage (Head of Organisation/Coordinator/Address)	Subject Area
50.	Kerala State Council for Science, Technology and Environment (KSCSTE), Thiruvananthapuram	Prof. V N Rajasekharan Pillai, Ex. Vice President, (KSCSTE), Dr. Kamalakshan Kokkal, Principal Scientific Officer & ENVIS Coordinator Sasthra Bhawan, Pattom P.O., Thiruvananthapuram-695 004, Kerala Phone: 0471-2548210, 2543701-05 Coordinator: 09447489587, 0471-2548213 Fax: 0471-2543558, 2540085 Email: ker@envis.nic.in, kscste@gmail.com, mailto@kscste.org drkokkal@yahoo.com URL: kerenvis.nic.in	Status of Environment and Related Issues
51.	Disaster Management Institute (DMI), Bhopal	Shri Manohar Dubey, Executive Director Dr. Rakesh Dubey, ENVIS Coordinator and Director DMI Housing and Environment Department, Paryavaran Parisar, E-5, Arera Colony, P.B.No.563, Bhopal-462 016, Madhya Pradesh Phone: 0755-2466715, 2461538, 2461348, 5293592 Fax: 0755-2466653 Coordinator- 09893250923 Email: mp@envis.nic.in, dmibpl@sancharnet.in, rakeshddubey@hotmail.com URL: mpenvis.nic.in	Status of Environment and Related Issues
52.	State Environment Department-Maharashtra, Mumbai	Dr. B.N. Patil, ENVIS Coordinator New Administrative Building, 15th Floor, Madam Cama Marg, Mantralaya, Mumbai-400 032, Maharashtra Phone: 022-22854707, 22855082 Coordinator: 9869942395 Fax: 022-22025946 Email: mah@envis.nic.in, envis.maharashtra@gmail.com URL: mahenvis.nic.in	Status of Environment and Related Issues
53.	Dept. of Environment and Forests, Imphal	Dr. M. Homeshwor Singh, Chairman, Project Implementation Committee, Senior Scientific Officer Dr. Y. Nabachandra Singh, ENVIS Coordinator Porompat (Near DC Imphal-East), Imphal (East)-795 010, Manipur Phone: 0385-2227625	Status of Environment and Related Issues

**Ministry of Environment & Forests**

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
		Coordinator: 09436035880, 09436038970 Fax: 0385-2227625, 2446670 Email: man@envis.nic.in, brajakumar_t@yahoo.com URL: manenvis.nic.in	
54.	Mizoram Pollution Control Board, Aizwal	Shri C.Lalduhawma, Member Secretary & ENVIS Coordinator Silver House, Tuikhuahlang, Aizwal-796 001, Mizoram Phone: 0389-2316591, 2326173, 231184, 09436142012 Fax: 0389-2316591, 2316590 Email: miz@envis.nic.in, duhawma15@yahoo.com, mpcb_azl@yahoo.com URL: mizenvis.nic.in	Status of Environment and Related Issues
55.	Nagaland Institute of Health, Environment and Social Welfare (NIHESW), Kohima	Mrs. P. Lotha, Director Dr. Inakhe Sumi, ENVIS Coordinator Opposite to Commissioner's Office, Old Secretariat Complex, Kohima-797 001, Nagaland Phone: 0370-2292086 Fax: 0370-2240626, 2245615, 2240180 Mob: 09436010783 Coordinator 09436001470 Email: nag@envis.nic.in, nihesw@yahoo.com URL: nagenvis.nic.in	Status of Environment and Related Issues
56.	Centre for Environmental Studies (CES), Forest & Environment Department, Bhubaneswar	Ms Sailabala Padhi, Director & ENVIS Coordinator Forest & Environment Department, Government of Odisha, N-1/247, IRC Village, Nayapalli, Bhubaneswar-751 015, Odisha Phone: 0674-2551853, 2551853 Coordinator: 09437011837, 09937095353 Fax: 0674-2553182 Email: ori@envis.nic.in, cesOdisha@rediffmail.com URL: orienvis.nic.in	Status of Environment and Related Issues
57.	Punjab State Council for Science and Technology (PSCST), Chandigarh	Ms. Neelima Jerath, Executive Director Shri Gurharminder Singh, ENVIS Coordinator MGSIPA Complex, Second Floor,	Status of Environment and Related Issues

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
		Adj. Sacred Heart School, Sector-26, Chandigarh-160 019, Punjab Phone: 0172- 2793600, 2792325, 2793300, Ext. 140 Fax: 0172-2793143 Coordinator: 9815655801 Email: pun@envis.nic.in, neelimajerath@pscst.com, ravleenmarwah@gmail.com URL: punenvis.nic.in	
58.	Rajasthan State Pollution Control Board, Jaipur	Dr. V. S.Singh, Chairman Shri Vijai Singhal, ENVIS Coordinator 4, Institutional Area, Jhalana Doongari, Jaipur-302 004, Rajasthan Phone: 0141-2705731, 2707285,2711263 Fax: 0141-2709980 Email: raj@envis.nic.in, member-secretary@rpcb.nic.in URL: rajenvis.nic.in	Status of Environment and Related Issues
59.	Forests, Environment & Wildlife Management Department, Gangtok	Shri N.T. Bhutia, IFS, PCCF-cum-Secretary Shri Y.P. Gurung, IFS and ENVIS Coordinator ENVIS Centre Sikkim, Forest Secretariat Annex-II, Ground Floor, Room No.1101/1102, Deorali, Gangtok-737 102, Sikkim (East) Phone: 03592-280381, 281778, 281145 Fax: 03592-280381, 281778, 09434077006, 09434109635, Email: sik@envis.nic.in, pccfcumsecretary@gmail.com, st_lachungpa@hotmail.com URL: sikenvis.nic.in	Status of Environment and Related Issues
60.	Department of Environment, Chennai	Thiru T.S. Srinivasamurthy, I.F.S, Director of Environment Shri J.D. Marcus Knight, ENVIS Coordinator #1, Jeenis Road, 4th Floor Down, Panagal Building, Saidapet, Chennai-600 015, Tamil Nadu Phone: 044-24331243, 24336421 Coordinator: 09884338406 Fax: 044-24336594 Email: tn@envis.nic.in, tndoe@eth.net URL: tnenvis.nic.in	Status of Environment and Related Issues

**Ministry of Environment & Forests**

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
61.	Tripura State Pollution Control Board, Agartala	Prof. Mihir Deb, Chairman Shri Sumonta Chakraborti, Environmental Engineer Parivesh Bhawan, Pandit Nehru Complex, Gorkhabasti, P.O. Kunjaban, Agartala-799 006, Tripura Phone: 0381-2322462, 2306233 Coordinator: 09436122197 Fax: 0381-2225421 Email: trp@envis.nic.in, tripuraenvis@rediffmail.com URL: trpenvis.nic.in	Status of Environment and Related Issues
62.	Environment Directorate - Lucknow	Shri O.P. Verma, Director(I/C) Shri R.K. Sardana, ENVIS Coordinator Vinit Khand-1, Gomti Nagar, Lucknow-226 020, Uttar Pradesh Phone: 0522-2300541 Coordinator: 09450777908 Fax: 0522-2300543 Email: up@envis.nic.in, doeuplko@yahoo.com URL: upenvis.nic.in	Status of Environment and Related Issues
63.	Uttarakhand Environment Protection & Pollution Control Board (UEPPCB), Dehradun	Dr. Ajay Gairola, Member Secretary Shri Amarjeet Singh Oberai, ENVIS Coordinator E-115, Nehru Colony, Hardwar Road, Dehradun-248 011, Uttarakhand Phone: 0135-2668922 Coordinator: 09412085568 Fax: 0135-2668092 Email: info@envis-ueppcb.com, envis.ueppcb@gmail.com utr@envis.nic.in, asoberai@yahoo.com URL: utrenvis.nic.in	Status of Environment and Related Issues
64.	Department of Environment and Forest, Port Blair	Shri S.S. Chaudhary, PCCF Shri George Jacob, ENVIS Coordinator Van Sadan, Haddo P.O., Port Blair-744 102, Andaman and Nicobar Phone: 03192-233233, 234430 Fax: 03192-230113, 244664 Email: an@envis.nic.in URL: as.and.nic.in/envis	Status of Environment and Related Issues

<b>Sl. No.</b>	<b>ENVIS Centre/ Organisation</b>	<b>Communication Linkage (Head of Organisation/Coordinator/Address)</b>	<b>Subject Area</b>
65.	Forest Department (Wildlife Division), Silvassa, Union Territories of Dadra & Nagar Haveli and Daman & Diu	Shri Richard D'Souza, Chairman Shri Birendra Chaudhary, IFS, Deputy Conservator of Forests (WL) / ENVIS Coordinator Van Bhavan, Opp. Gujarat Industrial Bank, Silvassa, Union Territory of Dadra and Nagar Haveli, Pin - 396 230 Phone: 0260 - 2643048, 02638-2230963, 2230524, 9825515965 Fax: 02638-2230804 Email: dd@envis.nic.in, envisddd@gmail.com	Status of Environment and Related Issues
66.	Department of Environment - Chandigarh	Shri. Ishwar Singh, Director, Shri P.J.S. Dadhwal, ENVIS Coordinator Chandigarh Administration, Addl. Town Hall Building, 2nd Floor, Sector 17-C, Chandigarh-160 001, Punjab Phone: 0172-2700065, 0172- 2700311, 9646712399 (SPO) Fax: 0172- 2700149 Email: ch@envis.nic.in, dadhwalpjsd@gmail.com URL: chenvis.nic.in	Status of Environment and Related Issues
67.	Puducherry Pollution Control Committee, Anna Nagar	Dr.N.Ramesh, ENVIS Coordinator Illrd Floor, Housing Board Building, Anna Nagar, Puducherry-605 005, Puducherry Phone: 0413-2201256 Mobile: 09443329141, 09443716026, 09442524264 Fax: 0413-2203494 Email: pon@envis.nic.in, ppcc.pon@nic.in, dste.pon@nic.in URL: dstepuducherry.gov.in/envis1.htm	Status of Environment and Related Issues

## MINISTRY OF ENVIRONMENT AND FOREST

PERFORMANCE AUDIT OF WATER POLLUTION IN INDIA (REPORT NO 21 OF 2011-12) FOR THE YEAR ENDING MARCH 2011 PRESENTED IN PARLIAMENT ON 16-12-2011

### Legislative and Policy framework

Water pollution has not been adequately addressed in any policy in India, both at the central and the State level. In the absence of a specific water pollution policy which would also incorporate prevention of pollution, treatment of polluted water and ecological restoration of polluted water bodies, government efforts in these areas would not get the required emphasis and thrust.

*(Paragraph 2.1, 2.3)*

### Planning for control of pollution of rivers, lakes and ground water

It was observed that MoEF and a number of States:

- did not undertake complete inventorisations of rivers/lakes and keystone species associated with them.  
*(Paragraph 3.1)*
- did not carry out identification of existing pollution levels in rivers and lakes in terms of biological indicators.  
*(Paragraph 3.2)*
- had not identified and quantified contaminants in rivers, lakes and ground water.  
*(Paragraph 3.3)*
- were yet to identify and quantify human activities that impact water quality.  
*(Paragraph 3.4)*
- had not assessed the risks of polluted water to health and environment.  
*(Paragraph 3.5)*
- had not adopted the basin level approach for control of pollution.  
*(Paragraph 3.6)*
- had not developed water quality goals, corresponding parameters for each river/lake and failed to enforce these.  
*(Paragraph 3.7)*

As such, overall planning for the control of pollution on part of MoEF and the States falls short of an ideal situation. This would have repercussions on implementation of programmes for control of pollution and their outcomes.

### Implementation of programmes for control of pollution of rivers, lakes and ground water

With regard to implementation of programmes for control of pollution of rivers, lakes and ground water, it was observed that:

- Current programmes for control of pollution of rivers, lakes and ground water were insufficient.  
*(Paragraph 4.1)*

- Institutional set-up to manage programmes for control of pollution in rivers, lakes and ground water was inadequate.

(Paragraph 4.2)

- Inclusion of rivers and lakes into National River Conservation Plan and National Lake Conservation Plan, respectively, was flawed.

(Paragraph 4.2 & 4.3)

- Performance of projects undertaken under NRCP was unsatisfactory. 82 per cent of the projects were completed after the scheduled date of completion. 28 projects costing Rs.251.27 crore were constructed but not utilised as yet. States implementing the projects faced problems in land acquisition, getting requisite permissions, especially forest clearances, technical problems, problems from contractors etc.

(Paragraph 4.4)

- NLCP as a programme has been ineffective in achieving the objective of conservation and restoration of lakes in India. Only two of the sampled 22 projects had been completed and the rest were either continuing beyond the sanction date of completion or had been abandoned. Problems like resistance from locals over proposed construction of STPs etc., dispute over site, inability to arrest sewage flow, non-availability of land etc., have contributed to non- completion of the projects.

(Paragraph 4.5)

Thus, programmes to control pollution of rivers and lakes in India have not had the desired results.

### **Monitoring of programmes for control of pollution of rivers, lakes and ground water**

Inspection and monitoring of projects being implemented under NRCP and NLCP was inadequate at all three levels, i.e., local level, State level and Central level.

(Paragraph 5.1)

There was paucity of network for tracking pollution of rivers, lakes and ground water as there were inadequate number of monitoring stations, no real- time monitoring of water quality was taking place and the data on water quality had not been disseminated adequately.

(Paragraph 5.2)

As such, monitoring of programmes was inadequate which points to weak internal controls existing at all levels of government.

### **Results of programmes for control of pollution in India**

River cleaning and control of pollution programmes for our polluted rivers are being implemented since 1985. The programmes seek to address pollution from point and non-point sources through construction of Sewage Treatment Plants, low cost sanitation, electric crematoria etc. However, the data on the results of these programmes are not very encouraging.

Ganga in certain stretches, Yamuna, Gomti, Godavari, Musi, Cauvery, Cooum, Mahananda, Khan, Kshipra, Vaigai, Chambal, Rani Chu, Mandovi, Sabarmati, Subarnarekha, Bhadra/Tungabhadra, Pennar, Pamba, Betwa, Krishna, Sutlej etc., continue to be plagued by high levels of organic pollution, low level of oxygen availability for aquatic organisms and bacteria, protozoa and viruses which have faecal-origin and which cause illnesses.

(Paragraph 6.1)

Most lakes in India are under threat from nutrient overloading which is causing their eutrophication and their eventual choking up from the weeds proliferating in the nutrient-rich water. Implementation of NLCP in conserving these lakes has had no discernible effect.

Pichola, Pushkar, Dimsagar, Banjara, Kotekere, Bellandur, Veli Akkulam, Shivpuri, Powai, Rankala, Twin lakes, Bindusagar, Mansagar, Mansiganga, Rabindra Sarovar, Mink, Kodaikanal lake, Dal lake, Durgabari lake, Laxminarayanbari Lake, Dimsagar Lake etc., have shown poor water quality. However, there have been some success stories like Nainital lake, Kotekere lake, Sharanabasaveshwara lake and Mansagar where water quality has improved after completion of conservation programmes.

*(Paragraph 6.2)*

### Resources and Utilisation of Funds

- Funds available for control and prevention of water pollution and restoration of wholesomeness of water were not adequate.

*(Paragraph 7.1)*