



ANNUAL REPORT 2012-13



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वहाँ है खुशहाली ॥

Ministry of Environment & Forests
Government of India





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An aerial photograph of a dense, lush green forest. The trees are vibrant and cover the entire landscape. In the upper portion of the image, there is a semi-transparent, rounded rectangular box containing white text. The text is centered and reads "ROLE AND MANDATE OF THE MINISTRY".

**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, Govt. of India for carrying out taxonomic and floristic studies on wild plant resources of the country. It was established on 13th February, 1890 with the basic objective to explore the plant resources of the country and to identify the plants species with economic virtues. 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



Fig-1. Palash (*Butea monosperma*) used for timber, resin, fodder, medicine and dye

general and protected areas, hotspots and *fragile* ecosystems in particular; publication of National, State and District Floras.

- Identification of threatened/red list species & 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 MoEF

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

Progress/achievements made during the year (upto Dec., 2012)

A. Botanical Exploration & Inventorisation of Phytodiversity

Field tours and Herbarium consultation tours

Sixty seven field tours were undertaken for floristic/ethnobotanical/ pharmacognostical studies on *flowering* and non-flowering plants, as well as live germplasm collection for introduction in the gardens, by different regional centres and units of BSI covering the following regions. These include 25 tours in 19 protected areas.

- **Western Himalaya:** Uttarakhand (*Upper Girthi valley, Badhani Forest, Sunderdhunga valley and its surroundings, Mothranwala and Mussoorie*); Jammu & Kashmir (*different localities of Ladakh in cold desert area*); Himachal Pradesh (*Shimla, Kullu, Manali, Narkanda and Rohtang*)
- **Eastern Himalaya:** Arunachal Pradesh (*Ajnaw District, West Siang District, East Kameng District, West Kameng District, Pakke Wildlife Sanctuary*); Sikkim (*Lunghang, Kupup, Memenchu lake and Tamzey area of East Sikkim; Lachen, Thangu and Yangri areas of North Sikkim; Lachen, Chopta Valley, Zema, Samthang, Kalep, Thangu and Chhaten of West Sikkim*); West Bengal (*Jalpaiguri District*)
- **North-East India:** Assam (*Ranga, Kakoi & Dullung Reserve Forests, North Lakhimpur*), Mizoram (*Murlen National Park, Blue Mountain National Park, Ngenpui Wildlife Sanctuary, Khawaglung Wildlife Sanctuary, Tawi Wildlife Sanctuary*), Meghalaya (*South Garo Hills – Siju Wildlife Sanctuary, Baghmara Pitcher Plant Wildlife Sanctuary and Balpakram National Park, Pynursla & Mawphlang block in East Khasi Hills district, Ri-Bhoi district, Sohrarim, Mawphlang, Laitkynsew, Mawryngkneng, Jowai and Jarain*)
- **Arid – Semi Arid:** Haryana (*Sultanpur National Park*); Gujarat (*Shoolpaneshwar Wildlife Sanctuary, Narmada, Dang District*); Rajasthan (*Jamwa Ramgarh Wildlife Sanctuary, Sirohi, Udaipur, Rajsamand and Chhittorgarh districts for lichens*)
- **Gangetic Plains:** Uttar Pradesh (*Upper Ganga Ramsar Site*), Chhattisgarh (*Korea and Korba area*); Jharkhand (*Koderma Wildlife Sanctuary, Palkot Wildlife Sanctuary, Udhwa Lake Bird Sanctuary, Ranchi, Ramgarh and Bokaro district for Algae*), Bihar (*Gautam Buddha Wildlife Sanctuary*), West Bengal (*Buxa Wildlife Sanctuary, Jaldapara Wildlife Sanctuary*); Odisha (*Nabarangpur, Balangir and Dhenkanal, Chilika lagoon and Rushikulya coast in Khurda and Ganjam district*)
- **Deccan Peninsula:** Andhra Pradesh (*Kadapa and Rajampeta divisions of Seshachalam Biosphere Reserve and Thimmamma marrimanu of Kadi area, Ananthapur district, Nagarjunasagar-Srisailem Wildlife Sanctuary*)
- **Western Ghats:** Maharashtra (*Lonavala, Khandala, Matheran and adjacent areas, Mahabaleshwar, Panchgani, Sawantwadi, Ambholighat, Radhanagari, Koyna Wildlife Sanctuary & adjacent areas, Kas Plateau, Great Indian Bustard Wildlife Sanctuary, Thane district*); Tamil Nadu (*Srivilliputhur Wildlife Sanctuary, Kalakad Mundanthurai Tiger Reserve, Tirunelveli*); Karnataka

(Sharavathi valley Wildlife Sanctuary, Pilikula Nisarga Dhama, Mangalore and Pilikula Nisarga Dhama, Agumbey and adjoining areas)

- **Coastal Region:** Kerala (Seaweeds of Kerala)
- **Andaman & Nicobar Islands:** North Andaman Islands (Narcondum Islands, East Islands, Peacock Islands, Paget Islands, North Reef Islands.); South Andaman Islands (Rani Jhasi Marine National Park); Little Andaman Islands (John Lawrence, Henry Lawrence, Outrum, Rutaland Island)

Apart from that 14 herbarium consultation tours and 16 ex-situ conservation tours were also conducted.

During these field tours, ca 13,743 specimens were collected and 5,791 specimens were identified into 5399 species. This resulted into the discovery of 01 new genus (Fungi), 17 new species, 22 new records for India and 33 new distributional records for biogeographic regions/states. 05 plant species were collected after more than 50 years.

New Genus

- *Beltramono* Dubey, Pandey & Manoharachary [Dematiaceae]

New species

- *Beltramono costei* Dubey, Pandey & Manoharachary [Dematiaceae]
- *Bispora aeglei* Dubey, Pandey & Manoharachary [Dematiaceae]
- *Caloplaca gyrophorica* Joshi, Y., Jagadeesh Ram, T.A.M. & G.P. Sinha [Ascomycota]
- *Corydalis devendrae* Pusalkar [Fumariaceae]
- *Corydalis magni* Pusalkar [Fumariaceae]
- *Drepanolejeunea devendrae* Sushil K. Singh & M. Dey [Lejeuneaceae]

- *Eragrostis henryi* C. P. Vivek, G.V.S. Murthy & V. J. Nair [Poaceae]
- *Eriocapitella rupicola* (Cambess.) Pusalkar, D.K. Singh & S.K. Srivast [Ranunculaceae]
- *Frullania mizoramensis* Sushil K.Singh & Barbhuiya [Frullaniaceae]
- *Lactarius crenulatus* K. Das & Verbeken [Russulaceae]
- *Lactarius croceigalus* K. Das & Verbeken [Russulaceae]
- *Nervilia pangteyana* J.S.Jalal, P.S. Kumar & G.S. Rawat [Orchidaceae]
- *Opegrapha granulosa* S. Joseph & G.P. Sinha [Opegraphaceae]
- *Rhododendron pangeanum* Mao A. A. and M. Bhaumik [Ericaceae]
- *Synnesia coonoorensis* S. Joseph & G.P. Sinha [Roccellaceae]
- *Tropidia hegderaoi* S. Misra [Orchidaceae]
- *Zeuxine mooneyi* S.Misra [Orchidaceae]

New Specific records for India

- *Anredera cordifolia* (Ten.) Steenis Basellaceae
- *Apistonema expansum* Geitler [Chryophyceae]
- *Bacidia arceutina* (Ach.) Rehm & Arnold [Ascomycota]
- *Bacidia heterochroa* (Müll. Arg.) Zahlbr. [Ascomycota]
- *Drepanolejeunea longii* Grolle & R.L.Zhu [Lejeuneaceae]
- *Drepanolejeunea siamensis* (Bischl.) Grolle & R.L.Zhu [Lejeuneaceae]
- *Drepanolejeunea tibetana* (P.C.Wu & J.S.Lou) Grolle & R.L.Zhu [Lejeuneaceae]
- *Ficus carica* L. sub. sp. *Rupestris* (Hauskn. ex Boiss.) Browicz. [Moraceae]

- *Hedyotis trimenii* Deb & Dutta [Rubiaceae]
- *Hyptis brevipes* Poit [Lamiaceae]
- *Ilex excelsa* (Wall.) Hook.f. var. *hypotricha* (Loesener) S.Y. Hu [Aquifoliaceae]
- *Kobresia gandakiensis* Rajbh. & H. Obha [Cyperaceae]
- *Kobresia kansuensis* Kiik [Cyperaceae]
- *Lactifluus ochrogalactus* (Hashiya) Wang [Russulaceae]
- *Lecanora bicincta* Ramond [Lecanoraceae]
- *Monallanthes brevicyndrus* Pascher [Xanthophyceae]
- *Radula chinensis* Steph. [Radulaceae]
- *Ranunculus hirtellus* Royle var. *orientalis* W.T. Wang [Ranunculaceae]
- *Stylosanthes hamata* (L.) Taub. [Fabaceae]
- *Synura splendida* Korshikov. [Chryophyceae]
- *Trachelomonas volvocina* var. *compressa* Drezep. [Euglaenophyceae]
- *Tylopilus pseudoscaber* (Secretan) Smith and Thiers [Boletaceae]

New Record for Region / State

Peninsular India

- *Ficus variegata* Blume [Moraceae]

Himalayas

- *Marchantia emarginata* Reinw. et al. subsp. *Emarginata* [Marchantiaceae]
- *Radula acuta* Mitt. [Radulaceae]
- *Radula pandei* Udar & Dh. Kumar [Radulaceae]

North Eastern Region

- *Frullania riojaneirensis* (Raddi) Spruce [Frullaniaceae]

Andaman & Nicobar Islands

- *Blumea milnei* Seem. [Asteraceae]
- *Eleocharis acutangula* (Roxb.) Schult. [Cyperaceae]
- *Epirixanthes elongata* Blume [Polygalaceae]
- *Erya nitida* Korth. [Theaceae]
- *Macroptilium atropurpureum* (DC.) Urb. [Leguminosae]
- *Scurrula parasitica* L. [Loranthaceae]
- *Strobilanthes viscosa* (Arn. ex Nees) T. Anders. var. *digitalis* [Acanthaceae]
- *Strobilanthes viscosa* (Arn. ex Nees) T. Anders. var. *viscosa* [Acanthaceae]
- *Trichosanthes quinquangulata* A. Gray [Cucurbitaceae]
- *Tristellateia australasiae* A. Rich [Malphiaceae]

Assam

- *Pertusaria thiospoda* Knight. [Pertusariaceae]

Himachal Pradesh

- *Arenaria kumaonensis* Maxim. [Caryophyllaceae]

Kerala

- *Memecylon clarkeanum* Cogn. [Melastomataceae]

Mizoram

- *Lycianthes laevis* (Dunal) Bitter [Solanaceae]
- *Frullania neurota* Taylor [Frullaniaceae]

Nagaland

- *Mycetia mukerjiana* Deb & Dutta [Rubiaceae]

Sikkim

- *Pertusaria hartmannii* Müll. Arg. [Pertusariaceae]

1

- *Marchantia emarginata* Reinw., Blume & Nees [Marchantiaceae]

Tamil Nadu

- *Anredera cordifolia* (Ten.) Steenis [Basellaceae]
- *Pertusaria endoxantha* Vain. [Pertusariaceae]
- *Vanda thwaitesii* Hook. f [Orchidaceae]

Uttarakhand

- *Androcorys pugioniformis* (Lindl. ex Hook.f.) K.Y. Lang [Orchidaceae]
- *Anemone obtusiloba* D. Don var. *potentilloides* Lauener [Ranunculaceae]
- *Paeonia emodi* Wall. ex Royle var. *glabrata* Hook.f. & Thomson [Ranunculaceae]
- *Parrya nudicaulis* (L.) Regel [Brassicaceae]

West Bengal

- *Cuphea carthagenensis* (Jacq.) J. F. Macbr. [Lythraceae]
- *Leucas zeylanica* (L.) R. Brown [Lamiaceae]
- *Merremia quinquefolia* (L.) Hallier f. [Convolvulaceae]

Plants collected after more than 50 years

- *Ardisia keenanii* C.B. Clarke (Myrsinaceae) after 138 years from Borail Wildlife Sanctuary in Cachar district of Assam
- *Taeniophyllum filiforme* J.J. Sm. (Orchidaceae) after a lapse of about 135 years from South Andaman.
- *Pellaea calomelanos* (Sw.) Link (Adiantaceae) after a lapse of about 100 years from Kumaon region in Central Himalayas
- *Polyalthia crassa* R.Parker (Annonaceae) after a lapse of about 92 years from North Andaman.

- *Sterculia khasiana* Debb. Ex Kanjilal, P. C. Kanjilal & Das (Sterculiaceae) after more than 100 years from Garo Hills in Meghalaya after its type collection.

B. Documentation of Phytodiversity

National Flora (Flora of India)

- Taxonomic description of 100 species (Family Acanthaceae) completed
- Taxonomic description of 4 species (Genus *Adiantum*) completed
- Taxonomic description of 20 species (Genera *Jencellus*, *Anosporum*, *Sorostachys* and remaining taxa of *Cyperus*) completed
- 364 species of following 14 projects have been completed by the Junior Research Fellows of BSI under Flora of India.
 - Floristic study of the liverworts and hornworts of Arunachal Pradesh with special reference to West Siang district; Moss Flora of Darjeeling District; Taxonomic Revision of Genus *Athyrium* Roth in India; Taxonomic Revision of Indian Hymenochaetaceae; Taxonomic Revision of Revision of family Pertusariaceae in India; Taxonomic Revision of Revision of family Roccellaceae in India; Taxonomic Revision of Revision of Genus *Kobresia* in India; Taxonomic Revision of Revision of the tribe Vernonieae (Asteraceae) in India; Taxonomic Revision of Subtribe Habenariinae (Orchidaceae) in India; Taxonomic Revision of the family Bignoniaceae; Taxonomic Revision of the family *Memecylaceae* in India; Taxonomic Revision of the genus *Festuca* in India; Taxonomic Revision of Tribe Heliantheae in India; Wetland flora of Gangetic plains in Bihar from Buxar to Katihar; Flora of Koyna Wildlife Sanctuary and Poaceae of Odisha State.

Regional/State/District Flora

Taxonomic description of 954 species for Flora of Uttarakhand, Flora of Gujarat, Grass Flora of Arunachal Pradesh, 65 species for Flora of Anjaw District, Arunachal Pradesh, Flora of West Siang District, Arunachal Pradesh, Polypodiaceae of North East India, Bryoflora (Hepaticae & Anthocerotae) of Mizoram, Flora of South Garo Hills Dist., Meghalaya, Wild Mushrooms of North Sikkim, Pteridophytic Flora of North Sikkim, Flora of Sikkim, Flora of Chhattisgarh, Floral Diversity of Upper Ganga Ramsar Site, Uttar Pradesh, Flora of Uttarakhand, Vol. II, Endemic & Threatened Pteridophytic Flora of North West Himalayas, Flora of Cold Desert of N. W. Himalayas, Vol. II (Part II), Flora of Gujarat State, Vol. III, Ferns of Maharashtra, Foliicolous Fungi of Maharashtra, Orchids of Maharashtra, Seaweed of Kerala Coast, Herbs and Shrubs of Greater Hyderabad, Flora of N. Andaman Isls. (Narcondam, Peacock, Paget and North Reef Isls.), Foliicolous lichens of Andaman Islands, Alpine & Sub-Alpine Flora of Central Arunachal Pradesh, Flora of Bihar, Flora of Jharkhand, Liverworts & Hornworts of Sikkim, Wood Rotting Fungi of Koderma Wildlife Sanctuary, Jharkhand and Algae of Jharkhand.

Flora of Protected Areas

Taxonomic description of 576 species Buxa Wildlife Sanctuary, Jalpaiguri, West Bengal; Gautama Buddha Wildlife Sanctuary, Bihar; Great Indian Bustard Wildlife Sanctuary, Maharashtra; Jaldapara Wildlife Sanctuary, Jalpaiguri, West Bengal; Jamwa Ramgarh Wildlife Sanctuary, Rajasthan; Koderma Wildlife Sanctuary, Jharkhand; Malabar Wildlife Sanctuary, Kakkayam, Kozhikode, Kerala; Murlen National Park, Mizoram; Nagarjunasagar Srisailem Wildlife Sanctuary, Andhra Pradesh; Pakhui Wildlife Sanctuary, East Kameng Dist.,



Fig-2. Water Lilly (*Nelumbo nucifera*)

Arunachal Pradesh; Palkot Wildlife Sanctuary, Jharkhand; Ranga, Kakoi and Dullung Reserve Forests, Assam; Rani Jhansi Marine National Park, South Andamans; Seshachalam Biosphere Reserve, Andhra Pradesh; Sharavathi Valley Wildlife Sanctuary, Shimoga, Karnataka; Shoolpaneshwar Wildlife Sanctuary, Narmada, Gujarat; Srivilliputhur Wildlife Sanctuary, Tamil Nadu; Sultanpur National Park, Haryana; Udhwa Lake Bird Sanctuary, Sahibganj, Jharkhand were completed

C. Ex-Situ Conservation

- 135 live plants under 49 species collected from Meghalaya & Arunachal Pradesh have been introduced in the nursery of Acharya Jagadish Chandra Bose IBG, Howrah.
- 23 rare and endangered species have been introduced in other associated botanic gardens of different Regional Centres.

D. Micro-Propagation of Threatened Species

- Multiplication of *Cymbidium tigrinum*, *C. eburneum*, *Illex khasiana* (at ERC, Shillong) and *Eremostachys superba*, *Pittosporum eriocarpum* and *Indopiptadenia oudhensis* (at NRC, Dehradun) have been taken up through tissue culture.

E. Studies of Nutritional Values of Wild Edible Plants of Meghalaya

- Total phenolic, flavonoid and flavonol content, reducing power and DPPH radical scavenging activity of wild edible fruits of *Zanthoxylum armatum*, *Gomphogyne cissiformis*, *Gymnopetalum cochinensis*, *Artocarpus gomeziana*, *Baccaurea sapida* and wild edible leaves of *Allium porrum*, *Carpesium cernuum*, *Tricyrtis pillosa*, *Spilanthes acmella*, *Leea sambucina*, collected from Meghalaya state, were carried out using different solvent system. The antioxidant activities of different parts of *Lysimachia laxa* and *Gymnocladus assamicus* were also carried out.

F. Documentation of Indegenous Knowledge of Plant Resources

- An ethnobotanical field tour was undertaken to Dhenkanal, Odisha state as per Annual Action Plan 2012-2013. A total of 320 ethnobotanical interested plant species in duplicate voucher specimens were collected with the help of medicine man from different tribal populated village at Dhenkanal. Among these 320 plants, 194 plants were used as medicine, 42 plants as edible, 14 plants for small timber, 5 for agriculture implements, 8 as bio-fencing, 3 plants as insect repellent, 3 as tooth brush, 3 for oil, 2 for liquor, 10 as fodder and 4 as rope/fibre.
- Another ethnobotanical field tour was undertaken to Balangir District, Odisha state as per Annual Action Plan 2012-2013. Collected 205 field nos. comprising 284 ethnobotanical information, which are used by the tribes and other rural people for different purposes e.g. medicine (148), edible (28), fodder (8), broom (2), tooth stick (3), plates (2), dye (2), Fish poison (2) and miscellaneous (89)

- One more ethnobotanical field tour was undertaken, to the Nabarangpur, Odisha. 216 nos. of ethnobotanical interested species in duplicate voucher specimens collected with the help of medicine man (Baidya or elder village people) from different tribal populated village areas at Nabarangpur district. There are about 270 ethnobotanical uses recorded. Out of 270 uses 153 are as medicinal 54 as food, 7 veterinary, 8 fodder, 7 rope making, 2 herbal dye, 9 tooth brush, 3 insect repellent 4 hair oil and 25 other purposes. Some of these specimens are dried properly and poisoned. GPS was used and recorded data of location of different places. Collected 20 items of different kind of seeds and plant parts for ethnobotanical museum. Visited weekly market (Hut) at a) Jharigaon b) Hathibari and collected different plant parts. About 250 photographs of different plant specimens and tribal habitation taken
- A total of 207 field nos. comprising 621 ethno-botanically important specimens, 36 exhibits for Museum and about 20 specimens (bulbs & corms) for garden were collected from Dang district, Gujarat.

G. Report of The Indian Botanical Liaison Officer

- Images of 205 Type/authentic specimen images were sent to various researchers in India.
- 694 pages photocopies of protologues of 37 species and 50 research papers, and three complete books related to Indian Botanic Gardens, which were published in 1861, 1895 and 1907, were sent for use by BSI scientists, University and College teachers and students. Apart from that more than 270 pages of downloaded

- articles (pdfs) and archival materials, especially of protologues, were sent as photo images.
- Some of the genera represented by only type or few authentic specimens, like *Brachystelma*, *Didymocarpus* were imaged.
 - About 150 type/authentic specimens of Lamiaceae were imaged and *ca.* 12 taxa were identified/confirmed based on images sent for identification/ confirmation. Nomenclatural problems for *ca.* 24 taxa, were solved/ clarified after referring the original publications.
 - During this period attended 12 lectures/talks at Kew and two evening meeting at the Linnean Society. One Symposium was also attended in which various lectures on different topics were given by the researchers funded by Bentham-Moxon Trust.

H. Floristic Study of Sacred Groves

- One day field trip to Thimmamma marrimanu of Kadiri area, Ananthapur district was undertaken on 2nd July 2012. 32 plant species have been enumerated from the sacred groves.
- 3 field tours viz., to 1. Chilkur Balaji, 2. Naubat pahad & 3. Syed Mir-Mohammad darga were conducted and documented the flora of the sacred groves. 24 specimens were collected.
- Conducted one herbarium consultation tour from 15th to 21st June to SV University, Anantapur.
- 2 non scheduled field tours were undertaken in Ranga Reddy District and Chittoor District and 33 specimens collected

- From 24.10.2012 to 05.11.2012, one field trip to Srikakulam District was undertaken and covered seven sacred groves viz., Jagathimetta, Mallemmathalli, Saigiri, Chinnammathalli, Peddammathalli, Jattlathada, and Mandlaboda. Collected 10 species and inventoried all the available species.

I. Publications

- Plant Discoveries 2011
- Vanaspati Anveshan 2011
- Bibliography and Abstracts of papers on Flora of Maharashtra.

The following publications are in press:

National Flora:

- Flora of India, Volume 23
- Fascicles to the Flora of India, Volume 25

State Flora & District Flora:

- Flora of Kerala, Volume 2
- Flora of Subansiri District, Arunachal Pradesh, Vol. 1 & Vol. 2
- Paschim Banglar Udvid, Volume 5

Specialized Group:

- Aphylophorales of Himalaya, Volume 1 & Volume 2
- Pharmacognosy of Negative listed plants
- Ephemeral Liverworts of Eastern Himalaya
- Bamboos of Meghalaya.
- Pictorial Guide of Some Indian Plants in CITES & Negative List of Export.

Checklists:

- Algae of India – Checklist 1 (Cyanophyceae)



Fig-3. Ashoka tree (*Saraca asoca*) – an important tree in the cultural traditions of the Indian Subcontinent and adjacent areas

- Algae of India – Checklist 2 (Chlorophyceae, Xanthophyceae, Chrysophyceae, Euglenophyceae)
- Algae of India – Checklist 3 (Marine Algae)
- Checklist of Gymnosperms of India
- Bibliography of Indian Poaceae (Gramineae)

Flora of Protected Areas:

- Flora of Gangotri National Park, Western Himalaya
- Flora of Rajiv Gandhi National Park, Karnataka
- Flora of Bhagawan Mahavir (Mollem) National Park, Goa
- Flora of Sri Venkateshwara National Park, Andhra Pradesh

Journals:

- Vanaspati Vividhata ki kuch visishta lekh
- Nelumbo, Volume 54 (1)
- Vanaspati Vani, Volume 21
- ENVIS Newsletter, Issue 17 (1)

In addition, scientists of BSI published 135 research papers and communicated 60 research papers in various peer reviewed journals, both Indian and foreign.

I. Miscellaneous

Maintenance and enrichment of Herbaria in BSI: During the period 1124 specimens mounted, 6,789 herbarium specimens remounted, 20,359 herbarium sheets dusted and fumigated, 14,268 herbarium sheets poisoned and 4,569 sheets have been incorporated in different herbaria.

Digitisation: BSI started digitizing its herbarium specimens in its Data Centre at CNH for creation of Digital Herbarium (DH) of high resolution images and Indian Virtual Herbarium (IVH) of low resolution images by deploying the manpower from its existing strength and set a target of digitization of 5000 specimens in the year 2012-13. Digitization of 2865 specimens completed by the month of December 2012.

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 9 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.

Revenue Earnings: During the period BSI earned ₹ 1,17,055/- (1) Sale of departmental publications (2) identification of plant specimens and supply of photocopied literature, etc.

Scientific Workshop/Training Programme attended/organized:

- A training course in plant taxonomy was organized at BSI, NRC, Dehradun during March 19–26, 2012. Total 39 (23 outside from Universities, Institutions) and 16 in house trainees have attended this training. 28 lectures on various topics on Plant Diversity and Herbarium Techniques were delivered by the resource persons of BSI, Forest Research Institute (FRI), Dehradun, National Botanical Research Institute (NBRI), Lucknow and Universities.

- A 'Capacity Building Training Course in Plant Taxonomy' organized by ENVIS-BSI during 21-22 April, 2012 in which more than 50 researchers participated.

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

Cryptogamic Unit

- Liverwort & Hornwort Flora of Sikkim
- Moss Flora of Darjeeling District, West Bengal
- Algal Flora of Jharkhand
- Wood Rotting Fungi of Koderma Wildlife Sanctuary (Jharkhand)

Ecology Unit

- A Checklist of Dinophyceae in India

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. It has 2132 species under

Table-1. Statewise Status of projects undergoing during 2012-13

Name of State/UT		Status (Projects undergoing during 2012)
Andaman & Nicobar Islands	1.	Flora of North Andaman Islands (Narcondam, Peacock, Paget, Landfall)
	2.	Flora of Rani Jhansi National Park
	3.	Foliicolous lichens of Andaman Islands
Andhra Pradesh	4.	Flora of Seshachalam Biosphere Reserve, Andhra Pradesh
	5.	Flora of Nagarjunasagar Srisailem Wildlife Sanctuary, Andhra Pradesh
	6.	Flora of 650 Sacred Groves of Andhra Pradesh
	7.	Herbs and Shrubs of Greater Hyderabad
Arunachal Pradesh	8.	Grass Flora of Arunachal Pradesh
	9.	Flora of Anjaw District
	10.	Flora of West Siang District
	11.	Flora of Pakhui Wild life Sanctuary, East Kameng
	12.	Alpine and Sub-Alpine Flora of Central Arunachal Pradesh
	13.	Liverworts and Hornworts of West Siang District
Assam	14.	Flora of Barnadi Wildlife Sanctuary
	15.	Flora of Ranga, Kakoi and Dullung Reserve Forests, Assam
Bihar	16.	Wetland flora of Gangetic plains in Bihar from Buxar to Katihar
	17.	Flora of Gautam Buddha Wildlife Sanctuary
	18.	Flora of Bihar
Chhattisgarh	19.	Flora of Chhattisgarh
Gujarat	20.	Ethnobotany of Junagarh District
	21.	Flora of Gujarat, Vol. III
	22.	Flora of Shoolpaneshwar Wildlife Sanctuary, Narmada
	23.	Lichens of Kutch and Gujarat
Haryana	24.	Flora of Sultanpur National Park
Jammu & Kashmir	25.	Endemic & Threatened Pteridophytic Flora of NW Himalayas
	26.	Flora of Cold Desert of NW Himalaya
	27.	Flora of Jammu & Kashmir, Volume V
Jharkhand	28.	Flora of Koderma Wildlife Sanctuary
	29.	Flora of Palkot Wildlife Sanctuary
	30.	Wood Rotting Fungi of Koderma Wildlife Sanctuary
	31.	Flora of Udhwa Lake Bird Sanctuary
	32.	Algal Flora of Jharkhand

Name of State/UT		Status (Projects undergoing during 2012)
	33.	Flora of Jharkhand
Karnataka	34.	Flora of Sharavathi valley Wildlife Sanctuary
Kerala	35.	Flora of Kerala, Volume V
	36.	Seaweed Survey of Kerala Coast
	37.	Flora of Malabar Wildlife Sanctuary, Kozikode
Maharashtra	38.	Ferns of Maharashtra
	39.	Flora of Great Indian Bustard Wildlife Sanctuary
	40.	Flora of Koyna Wildlife Sanctuary
	41.	Ficolous Fungi of Maharashtra
	42.	Studies on the Orchids of Maharashtra
Meghalaya	43.	Checklist of flora of Meghalaya
	44.	Flora of South Garo Hills Dist., Meghalaya
	45.	Chemical composition & nutritive value of wild edible plants of Meghalaya
Mizoram	46.	Bryoflora (Hepaticae & Anthocerotae) of Mizoram
	47.	Flora of Phawangpui Blue Mountain Peak, Mizoram
	48.	Flora of Murlen National Park, Mizoram
Odisha	49.	Ethnobotany of Odisha
	50.	Poaceae of Odisha
Rajasthan	51.	Flora of Jamwa Ramgarh Wildlife Sanctuary
	52.	Lichens of Rajasthan
Sikkim	53.	Liverwort & Hornwort Flora of Sikkim
	54.	Pteridophytic Flora of North Sikkim
	55.	Studies on Wild Mushrooms of North Sikkim
	56.	Flora of Sikkim
Tamil Nadu	57.	Flora of Srivilliputhur Wildlife Sanctuary
Uttar Pradesh	58.	Floral Diversity of Upper Ganga Ramsar Site,
Uttarakhand	59.	Flora of Uttarakhand
West Bengal	60.	Flora of Buxa Wildlife Sanctuary
	61.	Flora of West Bengal, Volume V
	62.	Moss Flora of Darjeeling District

Table-2. Budget Allocation (₹ in Thousand)

PLAN			NON PLAN		
BE 2012-13	Expenditure upto 31.12.2012	Percentage (%)	BE 2012-13	Expenditure upto 31.12.2012	Percentage (%)
127500	101075	79	236600	210062	89

cultivation including (two living types and) 1092 exotics. Every year over 5 lakh people visit the garden for education, awareness and recreation purposes.

Current Projects

- Collection, introduction and multiplication of 100 endemic, threatened, medicinal, ornamental and economically important plants
- Indigenous Palms of India
- Bamboos of India: Ex - situ Conservation
- Development of Division No. 25 of AJC Bose IBG.
- Orchids of Tripura & North Bengal
- **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
- Ethnomedicinal uses of Fabaceae in India recorded in herbarium and published literature
- Ethnobotanical information recorded in herbarium and literature for treatment of stone.
- **Industrial Section, Indian Museum, Kolkata:** Established in 1887 at Kolkata

has 20,000 exhibits of economic plants and plant products arranged in 8 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.

Current Projects

- Collection of economic plant materials for enrichment and replacement of exhibits of the Botanical gallery
- Listing of collections of George Watt deposited at BSIS
- **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 09 genera and 235 species new to science.

Current Projects

- Alpine and Sub-Alpine Flora of Central Arunachal Pradesh
- Editing & Updating of mss. of Flora of West Bengal, Vol. V (Monocot) Hydrocharitaceae - Poaceae (37 families)
- Editing of Flora of India, family Acanthaceae

- Flora of Bihar, Volume – I [Introduction, Key to the Families, Ranunculaceae – Mimosaceae (ca. 728 species, 62 families)]
- Flora of Buxa Wildlife Sanctuary, Jalpaiguri, WB. (ca 368.99 sq. km.)
- Flora of Gautam Buddha Wildlife Sanctuary, Bihar & Jharkhand, (ca. 259 sq. km.)
- Flora of Jaldapara Wildlife Sanctuary, West Bengal (ca 216.51 sq km)
- Flora of Jharkhand, Volume – I [Introduction, Key to the Families, Ranunculaceae – Mimosaceae (ca. 728 species, 62 families)]
- Flora of Koderma Wildlife Sanctuary, Jharkhand. (ca.150 sq. km)
- Flora of Palkot Wildlife Sanctuary, Jharkhand. ca.183 km²
- Flora of Udhwa Lake Bird Sanctuary, Jharkhand (ca 5.65 sq. km.)
- 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
- Study on Genera Jencellus, Anosporum, Sorostachys and remaining taxa of Cyperus under Flora of India. (ca. 88 taxa)
- Verification of deposition of types at different herbaria of BSI based on names of new taxa published during 1990 – 2004 in some selected journals
- **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 West Siang District, Arunachal Pradesh
- Liverworts and Hornworts of West Siang District
- Revision of Family Aspidiaceae in N.E. India
- Grass Flora of Arunachal Pradesh
- Flora of Pakhui Wild life Sanctuary, East Kameng
- Taxonomic Study of family Polypodiaceae (ca 100 spp.) of North East 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 5 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
- Checklist of flora of Meghalaya
- Flora of South Garo Hills Dist., Meghalaya
- Flora of Barnadi Wild life
- Flora of Ranga, Kakoi and Dullung Reserve Forests, Assam
- Flora of Murlen National Park, Mizoram
- 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 6 types representing 6 species discovered as new to science. The associated garden in the campus has ca 200 species, mostly orchids, under cultivation.

Current Projects

- Studies on Wild Mushrooms of North Sikkim
- Pteridophytic Flora of North Sikkim
- Flora of Sikkim
- **Central Regional Centre, Allahabad:** Jurisdiction – Madhya Pradesh, Chhatisgarh, Uttar Pradesh. Established in 1962 at Allahabad, the circle has ca 69,000 herbarium specimens, including 03 types. Seventeen species and 07 varieties have been described as new to science from here. The associated garden of 02 ha in the campus has ca 570 species under cultivation.

Current Projects

- Flora of Chhattisgarh
- Floral Diversity of Upper Ganga Ramsar Site, Uttar Pradesh
- Lichens of Rajasthan, Kutch and Gujarat
- 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 Odisha for BGIR.

Database on Oil Yielding Plants completed; hard copy format published (2008). Seeds Database initiated.

Current Projects

- Development of database of introduced trees of BGIR, NOIDA
- Development of database of medicinal plants
- Development of Database of Seeds of indigenous trees
- Protocol Development for germination of selected tree species
- Ecological survey of BGIR woodlands
- Recording of phenological data of species growing in garden
- **Northern Regional Centre, Dehradun:** Jurisdiction – 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 Uttarakhand, Vols. III & IV
- Revision of the Family Bignoniaceae in India
- Revision of the Genus Athyrium in India
- Revisionary studies of genus Adiantum L. in India (c. 31 spp.)
- Flora of Cold Desert of North West Himalayas
- Flora of Sultanpur National Park, Haryana

- Taxonomic Revision of Subtribe Habenariinae (Orchidaceae) in India
- Revision of Indian Hymenochaetaceae
- **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 09 species discovered as new to science. The associated garden of 06 acres in the campus has ca 185 species under cultivation.

Current Projects

- Flora of Gujarat, Vol. III
- Ethnobotany of Gujarat (Junagarh District)
- Flora of Jamwa Ramgarh Wildlife Sanctuary, Rajasthan
- Flora of Shoolpaneshwar Wildlife Sanctuary, Narmada, Gujarat
- **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 Great Indian Bustard Wildlife Sanctuary, Ahmednagar, Maharashtra
- Ferns of Maharashtra
- Foliicolous Fungi of Maharashtra
- Flora of Sharavathi valley Wildlife Sanctuary, Shimoga, Karnataka
- **Deccan Regional Centre, Hyderabad:** Jurisdiction – Andhra Pradesh, Odisha.

Established in 2005 at Hyderabad, the circle has ca 10,000 herbarium specimens.

Current Projects

- Herbs and Shrubs of Greater Hyderabad
- Flora of Seshachalam Biosphere Reserve, Andhra Pradesh
- Flora of Nagarjunasagar Srisailem Wildlife Sanctuary, Andhra Pradesh
- Flora of 650 Sacred Groves of Andhra Pradesh
- 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

- Seaweed survey of South East Coast of India.
- Flora of Kerala, Vols. III, IV & V
- Flora of Malabar Wildlife Sanctuary, Kozikode, Kerala
- Pollen and Seed morphology of Genus *Andrographis* Wall. ex Nees using SEM
- Seed morphology of *Ficus* L. using SEM
- Study of Caryopsis in *Eragrostis* *Sporobolus* and *Tripogon* genera of Poaceae using SEM
- Study of Pollinia of South Indian Orchids using SEM
- **ANDAMAN & NICOBAR REGIONAL CENTRE, PORT BLAIR:** Jurisdiction –

1

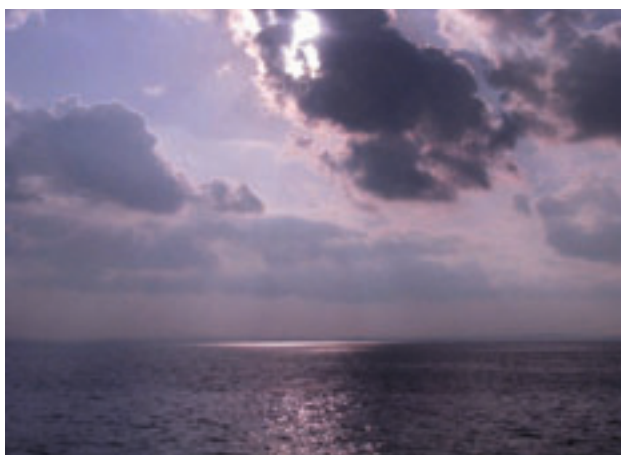


Fig-4. A view from great Andaman

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 Rani Jhansi Marine National Park
- Flora of N. Andaman Isls. (Narcondam, Peacock, Paget and North Reef Isls.)
- Follicolous lichens of 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 headquarter 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 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, publication of state faunas 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.

Performance/ Achievements/ Progress made during the year

Faunal explorations and surveys

Mountain Ecosystem: Four surveys were undertaken to Spity valley from Himachal Pradesh

Estuarine ecosystem: Four surveys, two to Pennar estuary from Andhra Pradesh, one to Diamond harbor from West Bengal and one to Narmada Tapti.

Marine /Island ecosystem: Six extensive surveys one each to Maharashtra and Gujarat

coast, one to east coast of India, one to Costal zone of Tamil Nadu, one to Gulf of Mannar and one to Kerala coast.

Biosphere Reserve / Conservation areas:

Fourteen surveys, two to Sunderban, one each to Middle Eastern Ghat, Eastern Ghat Northern Western Ghat and Southern Western Ghat, three to Western Ghat, one to Kachchh from Gujarat and two to Valmiki Tiger Reserve from Bihar during the year.

National Parks: Five surveys, one to Chambal from Madhya Pradesh, two to Saddle peak from Andaman, two to Sultanpur from Haryana.

Wildlife Sanctuaries: Ten surveys, three to Sajnekhali, West Bengal, one to Bethuadahari, West Bengal, two to Kalatop-Khajjar, Himachal Pradesh, one each to Kalakkad, Tamil Nadu, Bhitarkanika, Odisha, Nongkhyllen, Meghalaya and Landfall Island from Andaman.

States and Union territories: Under the state fauna programme 25 surveys in several districts of Andhra Pradesh, Assam, Himachal Pradesh, Jharkhand, Kerala, Tamil Nadu, Madhya Pradesh, Maharashtra, Rajasthan and Uttarakhand were carried out.

Ecological / Status Survey: Totally four Status/ ecological survey namely Fishes of Ganga Brahmaputra Drainage and Fishes of West Khasi Hills, Indian Golden Gecko (*Calodactyloides aureus*) and Coral reefs and associated organisms in Palk Bay were carried out.

Other studies: Totally eighteen surveys were undertaken, one on Insect Pest and Pollinator of crop pest of North Bengal, one to Budge Budge, South Parganas on Earthworm population, five to Indian Botanical garden, one to Bankura District on Lepidoptera, two to Bihar and Jharkhand, two to Arunachal Pradesh, three to Madhya Pradesh and three surveys to Eastern Himalaya to study on Zooplankton of lower Arunachal.

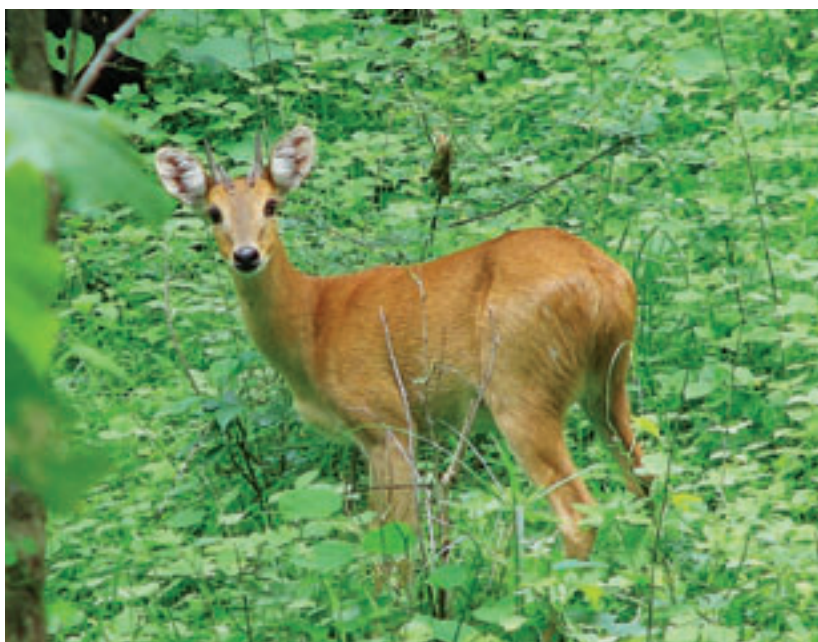


Fig-5. Chowsingha (*Tetracerus quadricornis*) the four-horned antelope in its wild habitat

Some Important Research studies undertaken

- Optical Characterisation of Corals – A collaborative project with Space Application Centre, Ahmedabad.
- Improving quality of Reefs through Transplantation/Restoration of Corals at Gulf of Kachchh (*Sponsored by World Bank*)
- Promoting Scientific Research and Molecular studies of Civets of the genus *Viverra* particularly Malabar Civet *V. civettina*
- Survey and monitoring the health of coral reefs of India, National Coral Reef Research Institute (NCRI) (*Sponsored by MoEF*)
- Diversity and Distribution of Corals and their Associated Fauna of Rani Jhansi Marine National Park, Andaman (*Sponsored by MoEF*).
- Monitoring the Coral Reefs of Andaman and Nicobar Islands (*Sponsored by: Department of Environment and Forests, Andaman and*

Nicobar Administration)

- Lead Institution-Great Nicobar Biosphere Reserve (*Sponsored by: MoEF*)
 - Faunal Diversity of Great Nicobar Biosphere Reserve (*Sponsored by: MoEF*).
 - Rapid EIA studies on the road alignment from Shastri Nagar to Indira Point, Great Nicobar Island (*Sponsored by: Border Roads Task Force, Ministry of Defense, Govt. of India*)
 - Preparation of Management Action Plan for Lohabarrack Crocodile Sanctuary, South Andaman (*Sponsored by: DoEF, Andaman and Nicobar Administration*)
 - Status survey on Holothurians of A&N Islands (*Sponsored by: DoEF, Andaman and Nicobar Administration*)
 - Rapid EIA studies on runway extension in Campbell Bay, Great Nicobar and Sibpur, North Andaman (*Sponsored by: Indian Navy, Ministry of Defense, Govt. of India*)
 - Strengthening of Marine Aquarium and Regional Centre at Digha, West Bengal (*Sponsored by: World Bank*)
 - All India Coordinated Project on Nematode Taxonomy (Capacity Building)
- Special Collaborative Projects:** The details of the special collaborative projects are as follows;
- Memorandum of Understanding (MoU) has been signed with the Indian Institute of Sciences, Bengaluru for molecular study of fishing cat.
 - 'Faunal Diversity of Protected Areas in Chhattisgarh (Phase-1)' and 'District-wise Faunal Diversity of Chhattisgarh (Phase-1)

(Sponsored by: Government of Chhattisgarh: CAMPA Fund)

- Feasibility study of re-introduction of Pygmy Hog in Garumara National Park, Jalpaiguri, West Bengal funded by Forest Directorate, Govt. of W. B.

Research Activities

Discoveries of New Taxa / Species: During the surveys 35310 examples of various groups of animals were collected. Altogether 16249 examples belonging to 1450 species were identified by the scientists of ZSI Head quarter and regional centres. In addition 11 species new to science have been described during the year and 47 species were added new to the fauna of India.

Species New to Science

- Three new discoveries of platyhelminthes
- *Batrachotremakorbaensis* Rizvi, Bursey and Bhutia, 2012
- *Opisthioparorchis nanoranae* Rizvi, Bursey and Bhutia, 2012
- *Opisthioparorchis dehradunensis* Rizvi, Bursey and Bhutia, 2012

One new discovery of centipedes (scolopendromorpha)

- *Cryptops malabarensis* Dhanya Balan, Sureshan and Vinod Khanna 2012

Two new discoveries of insects

- *Lathriobates manohardasi* Chandra and Jehamalar, 2012
- *Ochterus nicobarensis* Chandra and Jehamalar, 2012
- *Neodutaserrata* Rajamohana and Abhilas Peter, 2012

One new discovery of fresh water crab

- *Oziotelphus ganjamensis* Pati and Sharma, 2012

One new discovery of fish

- *Balitora laticauda* Jadhav and Dhanakar, 2012

One new discovery of scleratinian coral

- *Favites monticularis* sp.nov.

One new discovery of bird

- *Rallina* sp.

New addition to the fauna of India

- *Arcello excavata*
- *Centropyxis delicatula*
- *C. discoides*
- *Ercolania kencelesi*
- *Pseudoceros irretitus*
- *Chromoloris joshi*
- *Mexichromis mariei*
- *Hapalogenys filamentosus*
- *Goniopor apalmensis*
- *G. tenella*
- *Acropora crateriformis*
- *Montastrea magnistellata*
- *Platygyra yaeyamaensis*
- *Pavona frondifera*
- *Comanthina belli*
- *Gymnodoris okinawae*
- *Pseudoceros imitates*
- *Prosthiostomum tri lineatum*
- *Notospermus tricuspdatum*
- *Favia marshae*
- *Alveopora allingi*
- *A. gigas*
- *Balanophyllia merguensis*
- *B. vanderhorsti*
- *Paracyathus caeruleus*
- *Euphyllia paraglabrescens*
- *Catalophyllia jardinei*

Table-3. Details of number of species identified from different surveys

States/UT's	Protozoa	Rotifera	Nematoda	Mollusca	Annelida	Crustacea	Cladocera	Decapoda	Insecta	Odonata
Andhra Pradesh		10		6			11		13	
Assam	9								2	
Bihar		12		12				5		
Goa				65						
Gujarat				33						
Himachal Pradesh						4			12	
Karnataka						14				
Kerala							12	9		
Maharashtra				18		69				25
Mizoram						5				
Odisha						4			2	
Rajasthan		12	11							
Tamil Nadu	4	7	13	18		8				
Uttarakhand			8		10					
Uttar Pradesh				26						
West Bengal			4	20	15					

States/UT's	Orthoptera	Hemiptera	Homoptera	Coleoptera	Lepidoptera	Arachnida	Echinodermata	Fishes	Amphibia	Reptilia	Mammalia
Andhra Pradesh		8	13	5				3		7	
Assam				11					9		
Haryana	33					32		6			
Himachal Pradesh		58	22	13					7		
Madhya Pradesh		25		17	14						
Maharashtra		7	7	39	10			35		14	
Manipur									6	12	
Meghalaya		12						11	6		
Odisha						6		10			
Rajasthan								7			
Tamil Nadu		7					7	24			
Uttarakhand	23				41			35			
Uttar Pradesh				35							
West Bengal			5						34		

- *Montipora turtlensis*
- *M. crassituberculata*
- *Tetralianigro lineata*
- *Chrysiptera parasema*
- *Stylophora danae*
- *S. subseriata*
- *Halgerdealbo cristata*
- *Pseudobiceros gratus*
- *P. scintillate*
- *T. cinctipes*
- *Favorinus mirabilis*
- *Haplodoris estreyado*
- *Phyllidiapol kadita*
- *P. monacha*
- *Robastra gracilia*
- *Montipora samarensis*
- *Anacropora forbesi*
- *Seriatopora guttatus*
- *Psammacoraniar straszi*
- *Rhizopsammia verrilli*

Taxonomic studies

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

Fauna of States

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

Fauna of Conservation Areas

Tiger / Biosphere Reserve

- Sunderban, West Bengal: Two species of Grasshopper, five species of Brachyuran crab and three species of Dipterawere determined.

- Kachchh, Gujarat: Two species of Fishes and three species of ants were identified.
- Kalakkad, Mundanthurai, Tamil Nadu: Forty five species of Odonata, thirty two species of Gastropods, twenty four species of Fishes and four species of Insectawere determined.
- Middle Eastern Ghat, Tamil Nadu: Two species of Cladocera, sixteen species of Odonata, thirteen species of Gastropod, seven species of Lepidoptera, four species of Hymenoptera, seven species of Fishes and two species of Reptiles were determined.
- Northern Western Ghat, Maharashtra: Six species of Collembola were determined

Wildlife Sanctuary

- Phansad, Maharashtra: 27 species of Lepidoptera, 15 species of Orthoptera, 5 species of Scolopendromorpha, 20 species of Odonata, 3 species of Hymenoptera, 7 species of Frogs, 3 species of Lizards, 2 species of Collembola and 5 species of Fishes were determined.
- Veerangana Durgavati, Madhya Pradesh: 4 species of Lepidoptera, 8 species of



Fig-6. Lion

- Butterflies, 5 species of Odonata and 4 species of Spiders were determined.
- Singhori, Madhya Pradesh: 10 species of Scarabaeid beetles, 15 species of Lepidoptera, 22 species of Butterflies, 13 species of Fresh water Mollusca, 11 species of Lycosidaewere determined.
- Chail, Himachal Pradesh: 17 species of Lepidoptera, 3 species of Orthoptera, 3 species of Oligochaeta were determined.
- Radhangari, Maharashtra: 7 species of Fishes were determined.
- Kalatop-Khajjar, Himachal Pradesh: 8 species of Oligochaeta, 4 species of Lumbricidae, 19 species of Insects, 4 species of Orthoptera, 13 species of Lepidoptera and 2 species of Fishes were determined.
- Nongkhyllen, Meghalaya: 2 species of Amphibia, 16 species of Fishes and 2 species Snakes were determined.
- Pobitra, Assam: 4 species of Protozoa were determined.

National Parks

- Rajaji, Uttarakhand: 4 species of Protozoa, and 3 species of parasitic Nematode were determined.
- Silent Valley, Kerala: 2 species of Fishes were determined.
- Kaziranga, Assam: 4 species of protozoa were determined.
- Keibul-Lamjao, Manipur: 6 species of Amphibia were determined.
- Chandoli, Maharashtra: 2 species of Fishes were determined

Fauna of Important Ecosystems

- Spiti valley, Himachal Pradesh: 10 species of Insecta, 1 species of Frog and 2 species of Toads were determined

- Porurlake, Tamil Nadu: 15 species of Mollusca were determined

Wetland / Fresh water / Riverine

- Chambal River, Rajasthan: 9 species of Fishes were determined.
- Lakes of Udaipur, Rajasthan: 78 species of aquatic nematode were determined.
- Krishnarajasagar, Karnataka: 7 species of Fishes, 3 species of Rotifera, 5 species of Cladocera and 2 species of Copepod were determined.
- Konkan region, Maharashtra: 15 species of Fishes were determined.
- Palk Bay, Tamil Nadu: 4 species of Nematode, 5 species of Foraminifera and 2 species of Rhizopod were determined.

Forests

- West Khasi Hills, Meghalaya: 9 species of Hemiptera, 2 species of Toads were determined

Marine / Island / Coastal

- Pallikarani marsh, Tamil Nadu: Totally nine species of Amoebae and sixteen species of Fishes were determined.
- Andaman and Nicobar – 171 species of Scleractinian corals, 40 species of Echinoderms, 37 species of Nudibranchs, 107 species of Gastropods, 23 species of Crustacea, 57 species of butterflies, 43 species of Ophisthobranchs, 87 species of Mollusca, 22 species of Odonata, 12 species of Gorgonids, 6 species of Sponges, 5 species of Polyclads, 108 species of Fishes, 5 species of Amphibians, 13 species of Reptiles, 72 species of Birds and 7 species of mammals were determined.

Other studies

- **Pictorial Handbook on Fishes of North-East (NE):** List of 400 species updated and

photography is under progress.

- **Pictorial Handbook on Dragonflies and Damselflies of Rajasthan:** Description of 15 species was 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 35310 examples of specimens (unnamed) and 16250 identified specimens pertaining to 1450 species.



Fig-7. Tree frog or Flying frog (*genus Rhacophorus*)

Training and Extension

- Conducted "Capacity Building workshop on Protected Molluscs for Frontline staffs of Wild Life Enforcement Department" on 18.05.2012 in collaboration with Malacology Division of ZSI, at Annandale Hall of ZSI, HQ, Kolkata.
- Celebrated "International Biodiversity Day" on 22.05.2012 at Annandale Hall, ZSI, Kolkata.

Publications

- **Records of Zoological Survey of India:** Vol.111. Part -4
- **Occasional Papers:** No. 333 and 335.

Special Publications

- Animal Discoveries-2011
- National and State Animals of India
- Marine Biodiversity in India
- Coral Identification manual
- Marine Ecosystems and Marine Protected Areas in India

Table-4. Budget allocation and Progress of Expenditure during 2012-13 XII Plan Outlay

(₹ Crore)

Plan				Non-Plan			
BE 2012-13	RE 2012-13	Exp. Upto 31.12.2012	(%)	BE 2012-13	RE 2012-13	Exp. Upto 31.12.2012	(%)
15.32	18.41	13.13	85	16.35	17.91	14.69	90

- Guide to Dangerous and Venomous Marine Animals of A&N
- Paschim Bango Sadharan Samudric Prani (Bangla)- Marine Animals of West Bengal
- **State fauna Series:** Fauna of Andaman and Nicobar Islands (Part-1); Fauna of Maharashtra Part-1 and 2

State/UT-wise Status (wherever applicable)

There are 28 States and 7 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 volume), Lakshadweep (one volume), Madhya Pradesh (including Chhattisgarh (two volume), Manipur (three volume), Meghalaya (ten volume), Mizoram (two volume Nagaland (one volume), Odisha (four volumes published), Sikkim (five volume), Tamil Nadu (one volume), Tripura (four volume), Uttarakhand (three volume) and West Bengal (twelve volume).

Budget allocation and Progress of Expenditure during 2012-13

Budget allocation and Progress of Expenditure during 2012-13 XII Plan Outlay is given in Table-4.

Empowerment of Women/weaker Sections matters

The ZSI has constituted a Women's Complaint Committee in which female and male members have been included as per Supreme Court Guidelines. The committee deals with the complaints of Sexual Harassment at Work Place. Till date no complaint about Sexual Harassment has been received.

Updated list of autonomous, attached, sub-ordinate and Regional offices under the administrative purview of the Division; along with appraisal of the functioning of each in relation to their objectives.

The headquarters of ZSI is based at Kolkata and have 16 Regional Centres across the country covering all the bio-geographic regions of the country. The various regional centres under the administrative purview of ZSI are area or ecosystem specific and are as follows with the year of formation:

- North Eastern Regional Centre (NERC), Shillong, Meghalaya (1959)
- Western Regional Centre (WRC), Pune, Maharashtra (1959)
- Central Zone Regional Centre (CZRC), Jabalpur, Madhya Pradesh (1960)
- Desert Regional Centre (DRC), Jodhpur, Rajasthan (1960)
- Northern Regional Centre (NRC), Dehra Dun, Uttarakhand (1960)

- Southern Regional Centre (SRC), Chennai, Tamil Nadu (1961)
- Gangetic Plains Regional Centre (GPRC), Patna, Bihar (1965)
- High Altitude Regional Centre (HARC), Solan, Himachal Pradesh (1968)
- Marine Biology Regional Centre (MBRC), Chennai, Tamil Nadu (1973)
- Andaman and Nicobar Regional Centre (ANRC), Port Blair (1977)
- Freshwater Biology Regional Centre (FBRC), Hyderabad, Andhra Pradesh (1979)
- Sunderban Regional Centre (SRC), Canning, West Bengal (1979)
- Estuarine Biology Regional Centre (EBRC), Gopalpur-on-Sea, Ganjam, Odisha (1980)
- Western Ghat Regional Centre (WGRC), Kozhikode, Kerala (1980)
- Arunachal Pradesh Regional Centre (APRC), Itanagar, Arunachal Pradesh (1983)
- Marine Aquarium cum Regional Centre (MARC), Digha, West Bengal (1989)

Agreements with countries/International Organizations.

Zoological Survey of India has signed an agreement of co-operation with the Institute for Tropical Biology and Conservation, University of Malaysia, Sabah, Malaysia.

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, etc.

Important Activities Undertaken

This Division executes plan scheme 'Strengthening of Forestry Division' with five components under which the main works of the division related to above mandate are executed. These works 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 "Preinvestment Survey of Forest Resources" (PISFR), a project initiated in 1965 by Government of India with the sponsorship of Food and Agriculture Organisation (FAO) and United Nations Development Programme (UNDP). The main objective of PISFR was to ascertain the availability of raw material for establishment of wood based industries in selected areas of the country. In its report in 1976, the National Commission on Agriculture (NCA) recommended the creation of a National Forest Survey Organization for collection of reliable data through countrywide comprehensive forest resources survey at regular intervals. Consequently, PISFR was reorganized into FSI in June 1981. After a critical review of activities, 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 main objectives of FSI are as follows:

Objectives of FSI

- To assess the forest cover of the country through Remote Sensing technology,

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Fig-8. A view of of dry deciduous forests

analyse the changes and prepare State of Forest Report biennially.

- To conduct inventory in forests and non-forest areas at national level and develop database on wood volume and also estimate tree cover.
- To function as a nodal agency for collection, compilation, storage and dissemination of spatial database on forest resources.
- To conduct training of forestry personnel in application of technologies related to resources survey, remote sensing, GIS, etc.
- To strengthen research & development infrastructure in FSI and to conduct research on applied forest survey techniques.
- To support State/UT Forest Departments (SFD) in forest resources survey, mapping and inventory.
- To undertake forestry related special studies/consultancies and custom made training courses for SFD's and other organisations on project basis.

Major activities

The major activities of FSI are:

- Forest Cover Assessment every two years using Remote Sensing technology.

- Inventory of Forest and Trees Outside Forests (Rural & Urban areas).
- Data processing
- Methodology Design for carrying out various types of survey & inventory.
- Training and Extension
- Projects and Consultancies

Forests Cover Mapping & Tree Cover

Forest Survey of India (FSI) assess 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'(ISFR). With the release of the 'India State of Forest Report 2011' so far 12 cycles of forest cover assessment have been completed since 1987. Work for the 13th cycle is under progress. 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.

Forests & TOF inventory

Inventory of forests and Trees Outside Forests (TOF) is the second major activity of FSI. FSI has been following a new sampling design for National Forest Inventory (NFI) since 2002. The country has been divided into 14 physiographic zones and 60 districts randomly selected from these zones on probability proportional to size for detailed inventory in two years cycle. About 7,000 sample plots are laid in forest areas distributed over the country in each cycle for field inventory. The outcome of this inventory is estimation of growing stock according to species and diameter class wise at national levels. 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



Fig-9. Palash (*Butea monosperma*) used for timber, resin, fodder, medicine and dye

resources have gained importance because of their increasing role in meeting the needs of wood based industries and society. The outcome of the TOF inventory is estimation of growing stock in TOF areas, estimation of production of wood from TOF and tree cover.

The data collection work for ISFR 2013 has already been completed and data checking and data processing is under progress. The process of preparation of inventory of forest and TOF in selected 30 districts for 2012-13 is under progress.

Training

Forest Survey of India (FSI) has been imparting training to forestry personal of State Forest Departments since 1981 through short term courses (one/two weeks) on the modern geomatic tools such as remote sensing, GIS,

GPS, DGPS and inventory techniques. About 125 forestry personnel have been trained in different courses since April 2012 to December 2012. In addition to in house training courses, FSI is also conducting outreach training programme on GPS for imparting training to front line staff of State Forest Departments in a bulk number. During the current financial year upto December 2012, the outreach training programme has been conducted in three states namely Kerala, Tamil Nadu and Gujarat in which 191 forestry personals have been trained in handheld GPS.

Training on estimation of carbon tools and technologies by USDA Forest Service in USA.

A group of seven members; 5 from FSI and one each from Indian Council of Forestry Research and Education (ICFRE) and MoEF

visited different places in USA to get an exposure on estimation of carbon stock in forest. The training comprised of theoretical lectures and field visit . Under the field visit actual plots were laid down in different forest types. The training was found to be very useful and some of their techniques are being now piloted in India.

Recent initiative/achievements

Estimation of carbon stock in India's forest

FSI has been one of the major contributors on forest biomass estimation and carbon stock change. In India's Initial National Communication (INC) submitted to United Nation Framework Convention on Climate Change (UNFCCC) in 2004, FSI estimated forest carbon of only woody growing stock. In 2010, FSI has completed estimation of forest carbon stock and change between two time period viz 1994 and 2004 as part of Second National Communication (SNC) to UNFCCC. Since inventory of forest /TOF is a regular process of FSI which forms the basis for estimation of carbon stock, FSI is estimating carbon stock in India's forest, both at national and state level, using forest inventory data, forest cover mapping and forest type mapping information. A report on carbon stock in India's forest has been prepared by FSI giving details of carbon stock in different states.

Regional Consultation

With the new dimensions being added to the resource management practices in the country, there is inevitable need to work in close association with the State Forest Departments (SFDs). Consequently, regional consultations were held at Kolkata, Bengaluru, Nagpur and Dehradun during January-February 2012 in which senior officers of the respective SFDs

were present. The focus of these consultations was on the following:

- Establishment of National Forestry Information System;
- Near real time monitoring of forest fires;
- Alignment of forest inventory work of FSI with working plan exercise in the SFDs.

National Forest Information System (NFIS)

The vision of NFIS is to acquire and disseminate information from autonomous sources in support of sustainable forest management. It is a set of conventions for shared information management by independent parties as network nodes via web enabled service. Its main objectives are to provide ready access to the most current, consistent and reliable forest resources information on spatial and non-spatial data base on forest cover and forest types and other forestry layers of the country. This will be available on web enabled interactive GIS support system.

This will help in planning, implementation and real time monitoring of different schemes. It will act as an effective administrative tool for transparency aiding in socially inclusive and responsive public service. The types of information would include forest growth and classification in the country over a time line, health and assessment of forests for varied stress factors and climate monitoring and carbon sequestration in forests.

The Decision Support System (a subset of NFIS), under preparatory stage presently, will provide information of forest cover, forest type and biodiversity richness of recorded forests of the country. It will also provide information about the Protected Areas including corridors for all the states of the country. All the information shall be accessible through FSI Geoportal.

Real Time Monitoring of Forest Fires

FSI monitored forest fire incidences through remote sensing and GIS based technology from 2004 to 2011. FSI was doing near real time monitoring of forest fires through which forest fire alerts had been sent to State Forest Departments through SMS using a remote sensing based system developed by University of Maryland.

From 2012 onwards, FSI in collaboration with National Remote Sensing Centre (NRSC) has initiated a Real Time Monitoring of Forest Fire wherein the forest fire alerts from active fire locations are being generated as KML file which is Google compatible format. The alerts have been sent to registered users via Emails and SMS. KML alert would be up to state level whereas SMS alert would be up to district level. The time lag of the information is less than 2 hours from the receipt of information from the satellite.

Project for Forest Cover Mapping and Inventory of Forest/Tree Resources in Nagaland

In order to help Nagaland state, which has forest cover of 13,464 sq km (81.21% of the state's geographical area) for preparation of Working Plans of its nine forest divisions spread over 11 districts, a new project has been launched. The project has the objective to provide assistance to Nagaland Forest Department in preparation of different maps using remote sensing data and in carrying out inventory of forest and tree resources including vegetation survey and estimation of soil carbon as per the methodology laid down by FSI. In addition, species diversity and important Non-Timber Forest Products (NTFPs) will also be quantified.

FSI has imparted field training to forestry personnel of the state on these aspects to

enable them to carry out the field work while arrangement for quality control and quality assurance shall be done by FSI. The data processing and image processing work would be carried out by FSI. The outcome of the 18-month project will be district-wise forest type map, slope and aspect map, drainage map and forest cover draped digital elevation model at 30 m interval. In addition, an inventory report for the forest as well as non-forest areas will also be prepared for Nagaland state.

Inventory and Monitoring of Biosphere Reserves in India, using Remote Sensing and GIS Technology

FSI has taken up a project to study the temporal change in land use dynamics over the expanses of three Biosphere Reserves (BRs): viz. Pachmarhi in Madhya Pradesh, Achanakmar Amarkantak in M.P./Chhattisgarh and Nokrek in Meghalaya. It is envisaged to study the impact of BR management to develop and test RS & GIS based approach for assessment and valuation of ecosystem services in a selected Biosphere Reserve of the Himalayan region, and make recommendations for effective management of BR focusing on redefining zones and boundaries. Temporal change analysis for land use and land cover is to be done over 5 years' period since they were declared Biosphere Reserves. Landsat TM and LISS III data is being used for temporal change analysis. LISS IV data will be used for the year 2010. Making use of the latest RS images, a natural resource data base of the areas under the three Biosphere Reserves will be created with a focus on preparing land use and land cover maps. The maps and GIS layers shall be prepared at 1:50,000 scale.

The Biosphere Reserves are internationally designed landscape/seascape units under UNESCO's Man and Biosphere Programme for building harmonious relationship between

human activities and ecosystem conservation. There are 18 Biosphere Reserves in India, and besides FSI, three institutions (G.B. Pant Institute of Himalayan Environment & Development, MS Swaminathan Research Foundation and the National Remote Sensing Centre) are implementing agencies of this programme for the other 13 Biosphere Reserves.

CAMPA and e green watch

Compensatory Afforestation Fund Management and Planning Authority (CAMPA) was constituted on the order issued by Apex Court as National Advisory Council under the chairmanship of the Hon'ble Union Minister of Environment & Forests. The basic aim of CAMPA is to promote afforestation and reforestation activities as a way of compensating for land diverted to non-forest uses. The Apex Court also approved the guidelines issued by MoEF for utilizing CAMPA funds. An agency to be constituted in the State as the "State CAMPA". The need for monitoring of the CAMPA funds and proposed activities led to the formulation of the Integrated Concurrent Monitoring and Evaluation System (i-CCMES). An Information portal (i-CCMES) required to be designed to provide one-stop information source for all activities undertaken by CAMPA and facilitate a single sign-up facility for all future applications. The design and development of i-CCMES was conceptualized and proposed a platform with a framework for gathering, aggregating and serving data and providing a means for monitoring project delivery system that was, completely transparent, reliable, accountable, presentable data in real time, accessible to all stakeholders and public at large and allow for monitoring, evaluation, social and ecological audits.

It involved design and development of a web-based, role-based workflow applications

and integrated information system which would enable automating various functions and activities related to monitoring and transparency in the use of CAMPA funds and various works sanctioned in the Annual Plan of Operations (State CAMPA) approved by the State Authorities. It would also facilitate the optimal use of available ICT technologies for the institutionalization of monitoring mechanism to monitor and evaluate projects being undertaken by the State CAMPA. The name of i-CCMES was subsequently changed to e-Green Watch. At present, the e greenwatch portal is being hosted by NIC extensively relates to online monitoring of various afforestation works and allied works being undertaken by the



Decision Support System

Forest Survey of India is in the process of developing a GIS based Decision Support System for the use of Ministry of Environment and Forests to help facilitate dealing of Forest Conservation (FC) cases/proposals received by them. In this system, layers of spatial information pertaining to forest cover, forest types, protected area status, biodiversity and richness etc. are being provided so that for any proposal received by the Ministry, the information pertaining to the aforesaid parameters can be instantly generated and visualized by them on screen, making use of this GIS system being developed. In this regard,

digitized boundaries of areas under control of respective States Forest Departments are essentially required to be overlaid on the forest cover maps.

The digital data with regard to the Recorded Forest areas of the SFD's was received from 18 States. However, on analysis it was seen that out of these, the Recorded Forest area boundaries of only 12 States were usable and the rest of the six States were asked to refurnish their boundaries as the data furnished were incomplete. As of now, information with respect to the Recorded Forest area generated from Forest Cover and Forest Type Map has been completed in respect of 12 states. In addition, the information of Forest Cover, Forest Types has been deduced for 40 Tiger Reserves and 555 Protected Areas that include National Parks 89, Wild Life Sanctuaries 464, and two Conservation Reserves.

A number of correspondences have been carried with the concerned SFD's requesting them for urgent necessary action to complete digitization of forest boundaries in their respective states and furnish the said digital data to FSI at the earliest. It may also be mentioned that this data along with other layers of information being generated at FSI, would also form essential component of the National Forestry Information System (NFIS) for which FSI has already initiated action and consultations with State Forest Departments through its regional offices.

National Spatial Data Infrastructure (NSDI)

National Spatial Data Infrastructure (NSDI) for India is an initiative undertaken by Department of Science and Technology (DST), Govt. of India. NSDI aims 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. This endeavour of DST is aimed at creating a portal from which users may directly access and buy all kinds of spatial data generated by Indian mapping agencies. FSI is the nodal agency for forestry sector and has created spatial layers as per the requirements of NSDI in order to develop a national spatial knowledge repository.

In the current year, as part of the follow up to the previous year's work, FSI participated in NSDI12 on 20-21st December, 2012. National GIS for geospatial governance was the focus of the said meeting wherein FSI showcased the work progress carried at its end. Metadata creation in version 2.0 has been completed and has been submitted to NSDI for uploading on NSDI portal. The Web Server (Application Server) and Database Server have been installed and established as **FSI node** at Forest Survey of India, headquarters Dehradun. The server would be repository for the entire forestry database that would be available to users through internet. Preparation of data content standard for vegetation theme of FSI was prepared and submitted to NSDI. Web Map Service (WMS) services have also been prepared for Forest Cover of the entire country (state wise) and have been uploaded on NSDI portal. WMS services of India Forest Type Map have been created and uploaded on NSDI portal.

Meeting of the interoperability Working Group held on 8th December, 2012 at Delhi and chaired by FSI. The WMS services and Web Feature Service (WFS) services created by FSI were presented before the partner organizations. Only Survey of India (SOI) and partly National Remote Sensing Centre (NRSC) are other organizations which have shown some progress in the matter. The work progress

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shown by FSI was greatly appreciated by the house.

Indo-US workshop on developing reference baselines and scenario

FSI has conducted a two days Indo-US workshop during 7 -9th November,2012 at FSI Dehradun on developing reference baseline and scenario for forest sector inventories and carbon estimation for REDD+. Five expert from USFS, three from USAID and officers from varies state forest departments and representative from ICFRE, Forest Research Institute (FRI), Indira Gandhi National Forest Academy (IGNFA), and Wildlife Institute of India (WII) participated in the workshop.

Inventory of TOF in Uttarakhand

A project on inventory of TOF in five district of Uttrakhand namely Dehradun, Pauri Garhwal, Nanital, Udham Singh Nagar and Haridwar has been taken by FSI in collaboration with Uttarakhand State Forest Department. The work under the project in under progress.

Inventory of TOF Haryana Project

FSI has taken a project of Inventory of TOF in all district of Harayana. This project is also a collaborative project in which field work will be done by Harayana state forest department and other work such as data entry data checking, data processing and report writing will be done by FSI.

Network of Regional Offices

Six Regional Offices have been set up at Bengaluru, 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 hectare.
- 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 5 ha. & to examine / process the proposal above 5 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



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Fig-10. Guggal (*Commiphora wightii*) listed on the IUCN Red List of threatened species (Chapter-02 IUCN Red Listing)

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.

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 13th and 14th 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 Hon'ble Minister of Environment & Forests has approved 'in principle' the constitution of Indian Forest Certification Council. As per the approval, a draft Cabinet Note has been prepared.

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

The scheme was introduced during 11th Five Year Plan for assessment of Non Timber Forest Product (NTFP) 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, Government 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 year 2012-13, the Ministry has sanctioned the 2nd installment to Forest Research Institute, Dehradun for the project 'National Study on Commercial production of Non Timber Forest Products for Ensuring Fair Returns to Primary Collectors'.

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 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 25th 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

The 48th session of the International Tropical Timber Council (ITTC), the governing body of ITTO was held at Guatemala during 5th - 10th November, 2012.

– **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 ₹ 1.35 crores from DFID for the above project. During the 1st 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 Odisha States; Forest Survey of India; and Indian Institute of Forest Management (IIFM) undertook a review of the status of FLR in Madhya Pradesh, Odisha 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 as 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, Bhopal. During the current year, IIFM has submitted its report on above three projects to the Ministry and the same is under examination. The FRI, Dehradun has submitted a draft report on revised National Working Plan Code and same was circulated to all the stakeholders for their comments/views in the matter.

– **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 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 2012-13, an amount of ₹5.50 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.

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 & Committee on Non-Plan Expenditure (CNE) for the same.



CHAPTER-2
CONSERVATION

Environmental Conservation

Conservation and Management of Mangroves & Coral Reefs

Introduction

The Ministry of Environment and Forests is at the forefront and accords high priority to the conservation and management of mangroves and coral reefs in the Country.

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 mudflats. Mangrove vegetation has been reported in all the 12 coastal States/UTs. India is home to some of the best mangroves in the world. West Bengal has the maximum mangrove cover in the country, followed by Gujarat and Andaman & Nicobar Islands. However, not all coastal

areas are suitable for mangrove plantation as mangroves require an appropriate mix of saline and freshwater, and soft substrate like mudflats to enable it to grow and perpetuate. The Government has identified 38 mangrove areas throughout the Country for intensive conservation and management (Table-5).

The National Environment Policy and the Scheme

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

Mangroves

Mangroves play an important role in the protection of coastal ecology and coastal areas from the impact of tidal waves.

The Government seeks to sustain mangroves in the Country by both regulatory and promotional measures. The Coastal Regulation Zone Notification, 2011, recognizes 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 promotional measures, the Government has identified 38 mangrove areas on a countrywide basis for intensive conservation and management. During the



Fig-11. Mangroves in Andaman – home to a plethora of species

Table-5. Mangrove Sites in India

State/Union Territories		Mangrove areas
West Bengal	1.	Sunderbans
Odisha	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.
37.		Gulf of Khambhat
38.		Dumas-Ubhrat

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Table-6. State/UT-wise status of mangrove cover(Area in km²)

S. No.	State/UT	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	Odisha	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

financial year 2011-12, a sum of ₹ 8.86 crore was released to various Coastal States/UTs under the Centrally Sponsored Scheme for 'Conservation and Management of Mangroves'.

According to the Forest Survey of India (FSI) Report titled 'India State of Forest Report (2011)', the mangrove cover in the Country is 4,662.56 km² which is 0.14% of the Country's total geographical area. State/UT-wise mangrove cover as assessed by FSI in different assessments through the years is given in Table-6.

As would be noted from the above table, there has been a net increase of 23.56 km² of mangrove cover in the Country in the year 2011, as compared to the 2009 assessment. This can be attributed to increased plantations and regeneration of natural mangroves.

In the first assessment, the estimated extent of the mangrove cover was 4,046 km² which was carried out at 1:1 million scale. 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. The very dense mangrove comprises 1403 km² (30.10% of the mangrove cover), moderately dense mangrove is 1658.12 km² (35.57%), while open mangroves cover an area of 1600.44 km² (34.33%).

Coral Reefs

The Indian reef area is estimated to be 2,375 km². The four major coral reefs areas identified for intensive conservation and management in India are: i) Gulf of Mannar, ii) Gulf of Kachchh, iii) Lakshadweep and iv) Andaman and Nicobar Islands. The emphasis is more 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 for all the four identified coral reef areas 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 and various aspects of pollution in these areas.

Monitoring mechanism for the Centrally Sponsored Scheme on Conservation and Management of Mangroves and Coral Reefs.

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

A. National level

- The National Committee on Mangroves & Coral Reefs monitors the implementation of the approved Management Action Plans of the Coastal States/UTs.
- To supplement base-line information on priority areas for coastal and marine biodiversity, research projects are sanctioned to Universities and research institutions. A meeting of the Expert Group-B on 'Conservation & Sustainable Utilization of Natural Resources: Mangroves and Coral Reefs' was held from February 9-10, 2012. The Group considered 48 proposals, out of which fourteen research proposals have been recommended for financial assistance and these are being sanctioned by the Ministry.

B. State Level

- State Level Steering Committees have been constituted

under the Chairmanship of Chief Secretaries/Additional Chief Secretaries/ Principal Secretaries of concerned Department. The Committees may also include concerned departments, academicians, stakeholders and representatives from the Central Government to discuss the Management Action Plans and to review conservation activities undertaken from time to time.

Mangroves for the Future - India

- Mangroves for the Future (MFF) is a partnership-based initiative promoting investment in coastal ecosystems for sustainable development. MFF provides a collaborative platform to help countries, sectors and agencies in the MFF region to tackle the growing challenges to coastal sustainability.
- MFF in India primarily focuses on improving the scientific knowledge base for enhanced management of coastal

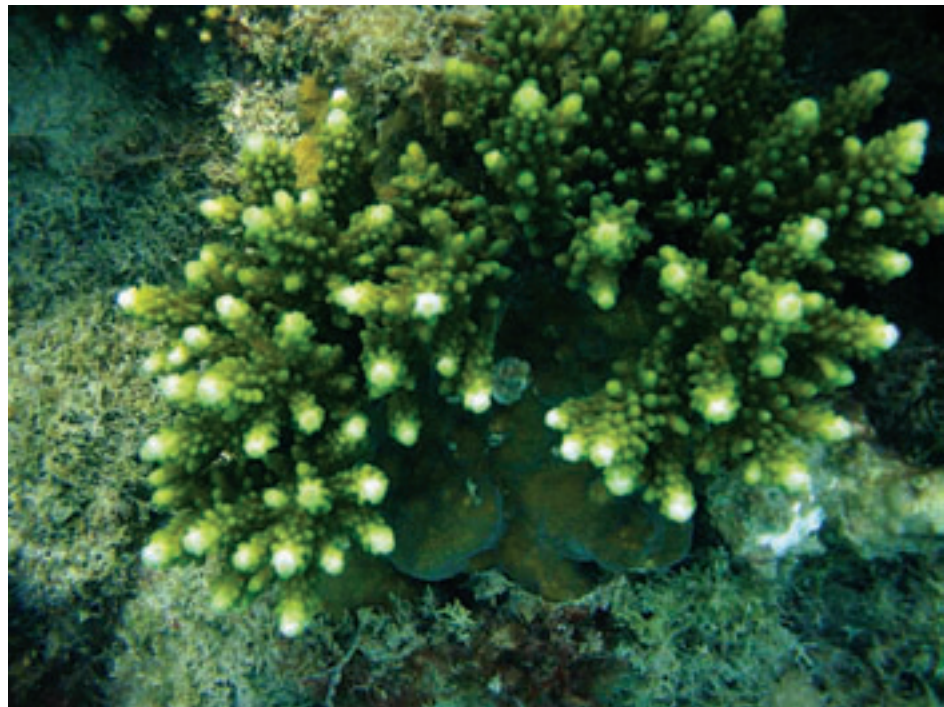


Fig-12. Corals (*Acropora hemprichi*) – needs protection

and marine ecosystems. National and regional symposia supported by MFF have greatly contributed by establishing baseline database for coastal and marine ecosystems (specifically mangroves and coral reefs). Information sharing with civil societies is also helping to raise awareness about India's valuable coastal resources.

- Mangroves for the Future (MFF), India is in its second phase (2012-2013). It is working through its small grant, medium grant projects and regional initiatives, to bridge knowledge gaps on vulnerable coastal and marine ecosystems, threatened species for better informed conservation actions and policy interventions. MFF (India) programme is implemented by International Union for Conservation of Nature (IUCN) India Office. MFF India is additionally working with coastal communities to increase resilience through livelihood interventions and ecosystem restoration.

Regional Colloquium

The Ministry of Environment and Forests, Government of India, hosted the Colloquium titled 'Sharing Lessons in Mangrove Restoration' from August 30-31, 2012 at Mamallapuram, Chennai. The Colloquium had participants from Bangladesh, India, Indonesia, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam. International mangrove scientist Dr. Norman Duke (James Cook University, Australia) and Alfredo Quarto, Executive Director of Mangrove Action Project (MAP, USA) were also present at the event along with representatives from IUCN, GIZ and government agencies from across the MFF region. The Colloquium discussed the economic and environmental values of mangroves; lessons learned from mangrove rehabilitation projects; guidelines

for good practices and relevance to climate change. As a way forward, participants also endorsed a 'Call to Action' statement based on the recommendations from the meeting. The Call to Action was projected by the MFF during the Eleventh Conference of Parties to the Convention on Biological Diversity held in October, 2012 at Hyderabad. Following the colloquium and with support from M. S. Swaminathan Research Foundation (MSSRF), a field trip was organized to the Pichavaram mangrove forest (September 1-2, 2012). The printed proceedings of this regional symposium were formally released at the Regional Steering Committee Meeting (RSC) held in Karachi, Pakistan from November 18-21, 2012.

MFF India at the Eleventh Conference of Parties to the Convention on Biological Diversity (CoP-11 to CBD), October, 2012, Hyderabad

- MFF India similarly co-hosted a convention on Biological Diversity (CBD) side event on '*Sustainable Management of Coastal and Marine Biodiversity*', with M.S. Swaminathan Research Foundation (MSSRF) and United Nations Development Programme (UNDP) on October 11, 2012. The objective of the event was to deliberate on (i) the issues and challenges faced in marine systems and (ii) to provide guidelines based on the experiences gained through the work conducted in conservation, sustainable use and management of coastal and marine bio-resources.
- MFF India and MFF Sri Lanka, with support from the MFF Secretariat, co-organized a side event during Conference of Parties (CoP)-11 to CBD on '*A Joint Strategy to Conserve Seagrass Beds in the Gulf of Mannar*', on October 16, 2012 at the Hyderabad International convention Centre (HICC), Hyderabad.

Regional Steering Committee (RSC) - IX

Shri Hem Pande, Additional Secretary, MoEF, Dr. J R Bhatt, Member Secretary, National Coordinating Body, India and Advisor, MoEF and Dr. V. Selvam, Scientist, MSSRF, Chennai attended the Ninth RSC meeting in Karachi from November 18-21, 2012. In this meeting, India's proposal to hold a workshop on 'Sustainable Marine Fisheries and Conservation of Coastal and Marine Biodiversity' was welcomed by the member countries and agreed upon. This workshop which will be held in the year 2013, will follow discussion on marine fisheries and biodiversity. In addition, India has also received an additional allocation of USD \$ 100,000 for small grants projects for the year 2013.

Knowledge Products

The MFF India documentary '*Mangroves, Guardians of the Coast*' was selected for screening at the International Film Festival, India (IFFI) in November, 2012 at Goa. The Government of India is also sharing the movie globally, through its embassies, as a prestigious and archival material for its Incredible India campaign.

The MFF India led scientific publication '*Coral Reefs in India: Status, Threats and Conservation Measures*' was released by the Minister for Environment and Forests, Government of India at CoP-11 to CBD.

The MFF India lessons learnt document titled, '*Coastal Sustainability: Learnings from MFF India project's*,' was also released at the CoP-11 to CBD. The book captures all the projects implemented and lessons learnt, capacity building initiatives undertaken and communication and knowledge products developed by MFF India between 2007 and 2011.

Biosphere Reserves

Introduction and Objective

Biosphere Reserves (BRs) 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 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. The Ministry provides financial assistance to the concerned State/

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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 eight viz., **Nilgiri** (Tamil Nadu, Kerala and Karnataka), **Gulf of Mannar** (Tamil Nadu), **Sunderban** (West Bengal), **Nanda Devi**, (Uttarakhand), **Pachmarhi** (Madhya Pradesh), **Similipal** (Odisha), **Nokrek** (Meghalaya) and **Achanakmar-Amarkantak** (Chhattisgarh and Madhya Pradesh), have been included in the World Network of Biosphere Reserves of UNESCO. Revised nomination form in respect of Great Nicobar (Andaman & Nicobar Islands) Biosphere Reserve has been finalized and forwarded to MAB Programme of UNESCO. 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 of 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, have been finalized and forwarded to the MAB Programme of the UNESCO, Paris.

- List of Biosphere Reserves with date of designation, area and location in the State(s)/UT is given in **Table-8**.
- Completed research projects during the period are at Annexure-IV
- Ongoing research projects during the period are at Annexure-III

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

Comparison of progress vis-a-vis that achieved in previous year (in case of ongoing scheme) is given in Table-7.

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

An amount of ₹11.50 crores was allocated and the expenditure incurred upto February, 2013 is ₹303.89 lakh.

Table-7. Comparison of progress vis-a-vis that achieved in previous year (in case of ongoing scheme)

S. No.	Activity	2011-12	2012-13 (as on 13.02.2013)
1	Number of Management action plans sanctioned for implementation in the BRs	13	8
2	Completed Research Projects	2	1
3	Ongoing Research Projects	15	15
4	New BRs designated	1	--
5	Nomination sent to UNESCO for inclusion in the World Network of BRs	1	1

Table-8. List of Designated Biosphere Reserves

S. No	Name of the BR & total geographical area (km ²)	Date of designation	Location in the States / UT
1.	Nilgiri (5520)	01.08.1986	Part of Wynad, Nagarhole, Bandipur and Madumalai, Nilambur, Silent Valley and Siruvani hills (Tamil Nadu, Kerala and Karnataka)
2.	Nanda Devi (5860.69)	18.01.1988	Part of Chamoli, Pithoragarh & Almora Districts in Uttarakhand
3.	Nokrek (820)	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 Daring districts in Assam.
5.	Sunderban (9630)	29.03.1989	Part of delta of Ganges & Brahmaputra river system in West Bengal.
6.	Gulf of Mannar (10500)	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.	Similipal (4374)	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.	Pachmarhi (4981.72)	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 Pathannthitta 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.	Kachhh (12,454)	29.01.2008	Part of Kachhh, 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-13. Beautiful butterfly of Lycaenidae family

Biodiversity Conservation

Under the scheme on the Biodiversity Conservation, there are two main subcomponents namely biodiversity and biosafety. The biodiversity component includes activities relating to Convention on Biological Diversity (CBD) and support to National Biodiversity Authority (NBA); and the biosafety component includes activities relating to Cartagena Protocol on Biosafety and issues relating to Genetic Engineering Appraisal Committee.

Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is one of the key agreements adopted during the Earth Summit held in Rio de Janeiro in 1992. The three objectives of the CBD are: conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising out of the use of genetic resources. Pursuant to the ratification of the CBD by India on 18 Feb 1994, several steps were initiated to meet the commitments under

the Convention, and to realize the opportunities offered by the Convention. These efforts were aimed at bringing the legislative, administrative and policy regimes in tune with the three-fold objectives of the CBD. India enacted the Biological Diversity Act in 2002 to give effect to the provision of this convention. Under this Act, a National Biodiversity Authority (NBA) has been set up in October, 2003 in Chennai. In 2000, a Cartagena Protocol on Biosafety (CPB) was adopted under the aegis of the CBD. The objective of CPB is to ensure safe transfer, handling

and use of living modified organisms resulting from modern biotechnology. India is a Party to the CBD as well as CPB.

Thereafter, a Nagoya Protocol on Access and Benefit Sharing (ABS) has been adopted in 2010 after six years of intense negotiations under the aegis of CBD. India has made significant positive contributions in these negotiations. The objective of this protocol is the fair and equitable sharing of benefits arising from the utilization of genetic resources.

Activities undertaken during the year

Convention on Biological Diversity (CBD) and Conference of the Parties (CoP-11)

Following the decision of the tenth 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 were continued during the year for hosting CoP-11 to the CBD.

- India successfully hosted the eleventh CoP to the CBD, and the sixth Conference

- of the Parties serving as Meeting of the Parties (CoP/MoP-6) to the CBD's Cartagena Protocol on Biosafety in Hyderabad from 1-19 October, 2012. The event provided India with an opportunity to consolidate, scale-up and showcase our initiatives and strengths on biodiversity.
- CoP-11 was the largest ever such conference organized in India. Approximately 6,000 delegates representing 171 countries, UN agencies, intergovernmental, non-governmental, indigenous and local community organizations, academia and the private sector participated in CoP-11. Minister /Vice Minister level participation at CoP-11 was around 80. The elements of successful CoP were flawless logistics, strategic thinking in the development of Agenda's content, participation of a large number of stakeholders and persuasive yet effective negotiations. The meetings were presided over by Ms. Jayanthi Natarajan, Minister for Environment and Forests, India as the President of CoP-11. The High Level Segment was inaugurated by the Prime Minister of India on 16th October 2012.
 - One of the most important outcomes of CoP-11 is the commitment of the Parties to double the total biodiversity-related international financial resource flows to developing countries by 2015 and at least maintaining this level until 2020. India successfully steered the negotiations at CoP-11 to arrive at this and other decisions of CoP-11.
 - The High Level Segment heard statements from around 80 Ministers and high-level representatives in the plenary session on 17th and 18th October 2012. Parallely, four panel discussions were held on: implementation of the Strategic Plan; biodiversity for livelihoods and poverty reduction; marine and coastal biodiversity; and implementation of the Nagoya Protocol on ABS. The outcome of the plenary statements and four panel discussions was brought out in the form of Chairs summary by the President of CoP-11 on the closing day on 19th October 2012.
 - The Prime Minister at CoP-11 also launched the 'Hyderabad Pledge', wherein he announced that the Government of India has decided to earmark a sum of US \$ 50 million during India's Presidency of CoP to strengthen institutional mechanism, enhance the technical and human capabilities for biodiversity conservation in India, and to promote similar capacity building in other developing countries.



Fig-14. Chocolate Pansy (*Junonia iphita*)

With this pledge, India has thus become the first Champion under the Hyderabad Call for Biodiversity Champions launched on CBD's website.

- The Prime Minister also unveiled a commemorative Pylon in Hyderabad to mark CoP-11. It has been decided to establish a Biodiversity Museum and a Garden on this site. The Prime Minister planted the first tree on behalf of India. Representatives of the participating countries at CoP-11 also planted trees. Hyderabad is the first host city of CBD CoP to establish commemorative Pylon, garden and museum.
- A number of other parallel meetings, nearly 300 side events, and exhibition were held during CoP-11. The parallel meetings included: the fair on experiences and best practices in communication, education and public awareness (CEPA), the Rio Conventions Pavilion, Youth Forum, Cities Biodiversity Summit, Parliamentarians event, business and biodiversity meeting.
- The brand ambassador of CoP-11 was the Science Express Biodiversity Special (SEBS), an innovative mobile exhibition mounted on a specially design 16 coach AC train travelling across India from 5th June to 22nd December 2012. This is a collaborative initiative between Ministry of Environment and Forests, Department of Science and Technology and the Indian Railways. The SEBS has already received over 23 lakh visitors breaking all previous records and has been playing a key role in creating awareness about biodiversity in the country.
- As incoming Presidency of CoP-11, India also hosted the second meeting of

Intergovernmental Committee on Nagoya Protocol (ICNP-2) in New Delhi from 2-6 July 2012 at Vigyan Bhawan in New Delhi. Over 500 participants representing Governments, intergovernmental and non-governmental organizations, local authorities, indigenous and local communities, research community and the private sector participated in this meeting.

- While India had signed the Nagoya Protocol on 11th May 2011, action was initiated during the year for ratifying the Protocol by undertaking interministerial consultations on a draft Cabinet note prepared for this purpose. After approval of the proposal by the Cabinet in its meeting held on 4th October, 2012, India ratified the Protocol on 9th October, 2012, which was announced by the Prime Minister in his speech during inauguration of the High Level Segment of CoP-11 on 16th October, 2012.

Biological Diversity Act, 2002

- 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) are to be established by the State Governments and Biodiversity Management Committees (BMCs) to be 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. 1st October 2003. It is an autonomous, statutory and regulatory organization which is intended to implement the provisions of Biological Diversity Act, 2002.

- Twenty-six States have so far set up the State Biodiversity Boards (SBBs). The matter is being pursued with Bihar and Jammu & Kashmir which are yet to set up SBBs.
- Sixteen states viz. Arunachal Pradesh, Andhra Pradesh, Assam, Gujarat, Rajasthan, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Sikkim, Tripura, Uttar Pradesh and West Bengal have notified the state specific rules in accordance with Section 63(1) of the Act.
- 33,415 BMCs have been constituted by the local bodies in 20 States viz., Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Manipur, Mizoram, Nagaland, Punjab, Tamilnadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.
- During the year, two meetings of the Authority were held on 23.05.2012 and 18.09.2012, and important decisions were taken on different matters. Sixty applications were received and are at various stages of processing during the period.
- NBA has received 759 applications so far. The applications received from public/private sectors and foreign nationals are for approval of access to bio resources and/or associated traditional knowledge. Out of

these, NBA has so far entered in to 108 agreements based on mutually agreed terms with the applicants for access to bioresources and/or associated traditional knowledge.

- Some of the important actions taken 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, Tripura, Andaman & Nicobar and Manipur, during the year, taking the number of States to 16.
- The UNEP – GEF & MoEF, Government of India project on “Strengthening the Implementation of the Biological Diversity Act & Rules with focus on its Access and Benefit Sharing provisions” is being implemented at the total cost of US\$ 9,839,000 in five states viz., Andhra Pradesh, Gujarat, Himachal Pradesh, Sikkim



Fig-15. Beautiful butterfly of Pieridae family

and West Bengal. The duration of the project is 3 years (April 2011-March 2014). State level launch of the project were held in Andhra Pradesh (Nov 2011), West Bengal (Dec 2011), Gujarat (Feb 2012), Himachal Pradesh (July 2012) and Sikkim (Dec 2012).

- 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. Ministry has conveyed no objection regarding the appointment of a service provider for this project.
- NBA has provided financial assistance to the tune of ₹ 42,33,000.00 to the SBBs to celebrate the International Day for Biological Diversity on 22 May 2012 in a befitting manner
- Funds have been accessed from GEF through a direct access project entitled "Strengthening the enabling environment for biodiversity conservation and management in India" to provide assistance in meeting the national reporting requirements to CBD by India which includes, revision of National Biodiversity Strategy and Action Plan (NBSAP) and preparation of fifth National Report for Biodiversity. Implementation of the project has been started

Some of the other important activities undertaken were following:

- Hosted a number of inter-sessional meetings on protected areas, NBSAPs, poverty eradication and biodiversity and biosafety during CoP-11.

- Implemented various provisions of B.D. Act through NBA.
- Prepared country's position and participated in negotiation meetings of CBD and its Nagoya Protocol on ABS.
- Fifth National Report preparation is being initiated.
- Ratified Nagoya Protocol after obtaining Cabinet Approval.
- Projects implemented through NBA
 - UNDP project on Strengthening the institutional structures to implement the Act in Madhya Pradesh and Jharkhand.
 - UNEP/GEF project on Strengthening the implementation of Biological Diversity Act is being implemented by MoEF through NBA. Pre and post release monitoring mechanisms are in place.
 - GEF funds through a direct access project entitled "Strengthening the enabling environment for biodiversity conservation and management in India" to provide assistance in meeting the national reporting requirements to CBD by India which includes, revision of National Biodiversity Strategy and Action Plan (NBSAP) and preparation of fifth National Report for Biodiversity. A preliminary meeting of this project was held on 18th December, 2012 to discuss the action plan.

Budget allocation and progress of expenditure during 2012-13; XII Plan Outlay

Annual Plan (2012-13) Approved Outlay ₹100.04 Crore (RE) and ₹ 71.98 Crore (BE).



Fig-16. Painted Lady (*Vanessa cardui*)

Implementing agencies, along with details of responsibilities

The Biological Diversity Act 2002 came into force in 2003. The Act extends to the whole of India. The objectives of the Act are conservation, sustainable utilization and fair and equitable sharing of benefits arising out of the use of biological resources and associated knowledge. The Act is being implemented in a three tiered institutional structures (NBA at National level, State Biodiversity Board at State level and Biodiversity Management Committee at local level)

Biodiversity Scheme / Genetic Engineering Approval Committee (GEAC)

Introduction

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" (Rules, 1989). The rules also cover 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 (GEAC), the apex body under the Rules, 1989 has the mandate to approve large scale trials and environmental release of Genetically Modified Organisms (GMOs) and ensure that research; development and testing of GMOs prior to environment release are conducted in a safe and scientific manner through appropriate implementation of Rule 1989 and biosafety guidelines.

Cartagena Biosafety Protocol

The Cartagena Protocol on Biosafety (CPB) was negotiated under the aegis of the Convention on Biological Diversity (CBD) and adopted on 29th January 2000. India is a party to the Protocol. The Protocol has come into force on 11th September 2003. As of date 164 countries are Parties to the Protocol.

The main objective of the Protocol is to ensure safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity, taking into account risk to human health.

Objective of the Scheme

The scheme helps in strengthening the biosafety management systems and awareness in India through implementation of:

- Rules, 1989
- Provisions of Cartagena Protocol on Biosafety (CPB)

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- National measures for bringing legislative, administrative and policy regimes in tune with CPB;
- National and international workshops / consultation

Activities undertaken during the year

Genetic Engineering Appraisal Committee (GEAC)

All genetically modified organisms and products thereof are regulated under Rules 1989 of EPA, 1986. Activities undertaken for implementation of Rules 1989 since inception till March 2011 include:

- Convene monthly GEAC meetings as per schedule for review of applications pertaining to GM technology. So far 112 meetings of the GEAC have been convened.
- Status of GEAC approvals is as given below:
 - Bt cotton, the first GM crop was approved in April 2002. As of date, the GEAC has approved environmental release of Bt cotton expressing six events,
 - Approvals for confined field trials of several GM crops for generation of biosafety data both from the private and public sector institutions. These include transgenic corn, rice, tomato, potato, castor, rubber, cotton, brinjal, mustard, groundnut, sorghum, okra, wheat, watermelon, papaya, sugarcane, banana etc.
 - 20 recombinant pharmaceuticals
 - Import of GM soybean oil.
 - Moratorium was issued on Bt brinjal Event EE-1 on the basis of public consultations held at seven locations.
- Review of Bt brinjal post moratorium is in progress.
- Formulation of biosafety guidelines for environmental and health safety assessment and updating the same to harmonize with international norms prescribed by the Organization for Economic Co-operation and Development (OECD), CODEX Alimentarius Commission and International Plant Protection Convention (IPPC) is a continuous process. The biosafety guidelines prescribed by the GEAC include the following:
 - Recombinant DNA Safety Guidelines, 1990 & 1994
 - Revised Guidelines for Research in Transgenic Plants and Guidelines for Toxicity and Allergenicity Evaluation, 1998
 - Guidelines and SOPs for the conduct of Confined Field Trials of Transgenic Plant, 2008
 - Guidelines for the Safety Assessment of GM Foods, 2008
 - Protocol for Safety Assessment of Genetically Engineered Plants / crops, 2008.
- Pursuant to environment release of Bt cotton, post release monitoring to assess the development of insect resistance to Bt gene in cotton crop is in progress since 2002. Central Institute of Cotton Research, Nagpur has been notified as the nodal agency to conduct the post release surveillance. A workshop on 'National Consultation on Insect Resistance Management (IRM strategy) in Bt cotton was also organized.
- GEAC has adopted the 'event based approval' mechanism wherein a new

procedure for commercial release of Bt cotton hybrids expressing approved events has been put in place.

- Biology documents for five crops namely cotton brinjal, rice, okra and maize have been completed. Biology documents for other crops have been initiated. .
- 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.
- Ex-ante socio-economic study on Bt brinjal was conducted through NCAP. Report submitted to GEAC.
- Extensive capacity building activities for biosafety assessment and awareness and efficient management of field trials of GM crops are being regularly undertaken.
- Revamping of GEAC website was undertaken to enhance transparency.
- Review of Rules 1989 to harmonize with the obligations under Cartagena Protocol on Biosafety has been initiated
- Exhaustive counter affidavits have been prepared for several court cases.
- To enhance biosafety awareness, electronic 'Biosafety Newsletter' has been introduced Four issues have been circulated across 4000 stakeholders. The online version is available on the GEAC website (<http://moef.nic.in/divisions/csurv/geac/information.html>).

Cartagena Biosafety Protocol

Six 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 was hosted by India at Hyderabad from October 1-5, 2012. The meeting was presided over by Ms. Jayanthi Natarajan, Minister for Environment and Forests, as the President of CoP-11. The event provided India with an opportunity to consolidate, scale-up and showcase our initiatives and strengths on biosafety.

Approximately 1300 participants representing nearly 100 Parties to the Protocol and other governments, UN agencies, intergovernmental and non-governmental organizations, academia and industry attended CoP-MoP 6. The CoP-MoP 6 meeting adopted 16 decisions on: compliance; the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress (the Supplementary Protocol); subsidiary bodies; cooperation with other organizations, conventions and initiatives; the Biosafety Clearing-House (BCH); capacity building; the roster of experts; monitoring and reporting; assessment and review; notification requirements; handling, transport, packaging and identification (HTPI) of living modified organisms (LMOs) (Article 18); unintentional transboundary movements of LMOs (Article 17); financial mechanism and resources; socio-economic considerations; risk assessment and risk management; and the budget. As of date COP-MOP has adopted 113 decisions.

The Indian delegation and experts have actively participated in the meetings of COP-MOP as well as preparatory meetings and online discussion forums organized by the CBD during the inter-sessional period prior to COP-MOP meetings.

As a follow-up to the COP-MOP decisions, several initiatives including capacity building and awareness programs to facilitate compliance have been undertaken. The recently held preparatory Regional Meetings/

Workshops prior to COP-MOP-6 include the following:

- Workshop on Capacity-Building for Research and Information Exchange on Socio-Economic Impacts of Living Modified Organisms under Cartagena Protocol on Biosafety, 14-16 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 November 2011.
- Asia Sub-Regional Training of Trainers' Workshop on the Identification and Documentation of Living Modified Organisms, 21-25 November 2011.
- South-Asia Conference on Current Approaches to the Environmental Risk Assessment (ERA) of Genetically Engineered Crops was organised jointly with South Asia biosafety Program, DBT and MoEF, 16-18 May 2011 at New Delhi. The conference was attended by about 180 participants from various stakeholder groups such as members of regulatory bodies; policymakers; scientists from industry, research institutions and universities; students and other organizations.

In compliance with the reporting requirements, India has submitted its first and second National Reports on implementation of CPB. The national reports were finalized following a consultative approach.

Several consultative meetings of experts and stakeholders have been convened prior to each COP-MOP meeting to finalize the country position and negotiating briefs.

Nagoya Kula Lumpur Supplementary Protocol on Liability and Redress

The fifth meeting of COP MOP to the

Cartagena Protocol on Biosafety (CPB) held at Nagoya, Japan in October 2010 adopted the Nagoya Kuala Lumpur Supplementary Protocol on Liability and Redress to the CPB after six years of intense negotiations. India has made significant positive contributions in finalisation of the Nagoya Kuala Lumpur Supplementary Protocol, which is being considered as a milestone achievement in multilateral environmental negotiations.

India has signed the Supplementary Protocol on October 11, 2011. As of date 51 countries are signatories to the Supplementary Protocol and 10 countries have ratified the Supplementary Protocol. The Protocol will enter into force on the ninetieth day after the date of deposit of the 40th instrument of ratification, acceptance, approval or accession.

Capacity building

As a Party to the CPB, MoEF has accessed funds from United Nations Environment Program (UNEP) / Global Environment Facility (GEF) for the "Phase-II Capacity Building Project on Biosafety" to strengthen the biosafety management system in India with special emphasis on risk assessment and management, handling, transport, packaging and identification of LMOs, socio economic considerations and public awareness with an aim to ensure adequate protection of human health and biodiversity from potential harm arising from all LMO-related activities. The FSP document received GEF approval on 8.8.2011 pursuant to which project initiation activities were taken up.

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 organized with GEF –UNEP assistance.

Progress/Achievements made during the year

- COP-MOP-6 has been successfully organized at Hyderabad in October, 2012.
- Hosted a number of inter-sessional national and regional meetings on biosafety issues.
- Two consultative meetings for finalizing the country position for CoP-MoP-6 at Hyderabad was convened
- Only one meeting of the GEAC was convened as the GEAC is in the progress of being re-constituted.
- Review of biosafety regulation in India is in progress in light of the recommendations received from the Technical Expert Committee (TEC) constituted by the Supreme Court, Standing Parliament Committee on Agriculture and the Scientific Advisory Council on Biotechnology on Agriculture of the Prime Minister.
- Streamlining of the biosafety management system in India through review of existing policies, development of biosafety guidelines, and development of biology guidelines etc has been initiated. These include:
 - Strengthen the monitoring mechanism of confined field trials of regulated GE plants.
 - Preparation of ERA guidelines for environmental risk assessment of genetically engineered crops.
 - 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).
- Biology documents for Rubber and Indian mustard is under preparation. Further eight more crops such as Tomato Potato Sorghum Chickpea Papaya and Pigeon-pea were identified and shortlisted for preparation of biology documents.
- Development of GEAC website has been completed. The overall structure of the website has been approved and the audit process has been initiated prior to launching of the website.
- SFC for the Phase-II Capacity Building Project on Biosafety” to strengthen the biosafety management system in India through GEF-UNEP assistance has been approved. The inception workshop and 1st meeting of the Steering Committee was convened wherein the Project Design and Annual Work Plan was approved. Selection of consultant to set up the PCMU is in progress.
- The study to probe the legal implication of ratification of the Supplementary Protocol and to identify legislative amendments required in the domestic law has been completed. The process of seeking Cabinet approval for ratification has been initiated.
- An international workshop on ABS, TK and Liability and Redress in the context of CPB for capacity building of Africa region is scheduled in February, 2013 at Bengaluru.

Budget allocation and progress of expenditure during 2012-13

Annual Plan (2012-13) Approved Outlay: ₹100.04 Crore (RE) and ₹71.98 Crore (BE).

Implementing agencies

Rules 1989 is implemented by MoEF,

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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 development of GMOs are being regulated by RCGM, administered by Department of Biotechnology (DBT). Whereas, experimental trials and environmental release of GMOs are appraised and approved by GEAC were administered by MoEF.

Biodiversity Conservation and Rural Livelihood Improvement Project

Introduction

The Project aims at Conservation of Biodiversity in selected landscapes (included protected areas/critical conservation areas) while improving rural livelihoods through participatory approaches. The Project is being implemented as a Centrally Sponsored Scheme with five financiers [International Development Association (loan), from Government of India, State Governments (Gujarat, Kerala & Tamil Nadu), and Beneficiaries, (all local stakeholders including Panchayati Raj Institution), amounting to US\$30.52 million (around ₹137.35 crores).

There are four major components in the project, viz (i) Demonstration of Landscape Conservation Approached in two Pilot Sites (ii) Strengthening knowledge Management and National Capacity for replication of successful models of Conservation in Additional Landscapes Sites and (iii) Scaling up and

(iv) National Coordination for Landscape Conservation. The implementation in selected landscapes would be done through the foundations/ societies, based on site specific landscape plans involving sectoral integration. The project duration is six years.

Activities Undertaken

- Signing of MOUs between the MoEF and the implementing agencies. Processing of Annual Plan of Operations (APOs) for 2012-13 and release of grant to various Implementing Agencies.
- Revision of 18 months Procurement Plan.
- Contractual appointment of project staff.

Achievement during the year

- The progress of project implementation has been related satisfactory by World Bank during its latest Implementation Support Mission conducted between 20th May and 25th June, 2012.

Budget allocation and expenditure during 2012-13

The budget allocation of the scheme is ₹1000.00 lakhs (Plan) against which an expenditure of ₹5.60 crore has been incurred till 31.12.2012.

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 21st 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. India started building capacity in Taxonomy much before the Global Taxonomic Initiative (GTI) came into existence, through overall strengthening of Botanical and Zoological surveys as well as launching a dedicated All India Coordinated Project on Capacity Building in Taxonomy (AICOPTAX).

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.

To find out the ways and means by which the existing gaps in taxonomic knowledge could be filled, the Ministry of Environment and Forests (MoEF) – a nodal agency within the Government of India for environmental protection and conservation of biodiversity – organized a two-day national workshop on "Capacity Building in Taxonomy in India on 15th & 16th February 1996 at Jaipur. Sixty two leading taxonomists of the country participated in the workshop, and after lengthy deliberations, made a number of action oriented recommendations for capacity building in taxonomy. One of the prioritized recommendations was to initiate an All India Coordinated Project on Capacity Building in Taxonomy, besides taking steps for strengthening education and training. This recommendation was endorsed by the then Task Force constituted by the MoEF. The Scientific Advisory Committee to the Cabinet (SAC-C) also endorsed the recommendation. Accordingly, an All India Coordinated Project on Taxonomy Capacity Building was launched in 1999, much before Global Taxonomic Initiative (GTI) came into existence.

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:

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- Survey, collection, identification and preservation of elements of biodiversity of the country with emphasis on protected areas.
- Training research fellows and college teachers and building capacity in the field of taxonomy.
- Maintain 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 important achievements of the 15 thematic areas include: discovery of species new to science, new records for India, floristic and faunal accounts, status of species, number of students training in taxonomy and enrolled for doctoral studies, etc. For brief reports on each theme, the reader may glean through the separate sheets enclosed in this folder. The MoEF has spent about ₹12.40 crores during XI Plan period on AICOPTAX Scheme. Some significant achievements are as follows:

Survey and exploration – Tours undertaken	:	1323
Number of collections added to national		
Reference collections	:	53715
Number of species identified/characterized/ Described	:	12789
Documentation of flora and fauna (with descriptions)	:	6759
Human resource development/training in Biosystematics		
Number of persons trained in taxonomy	:	450
Number of students enrolled for Ph.D	:	105
New Discoveries		
Taxa new to science	:	570
Taxa new to India	:	449
Species collected after a gap of 50 years or more	:	189
Number of rare taxa recorded from new locations	:	1059
Publications: Book	:	7
Research Papers	:	333
Book chapters	:	61
Popular articles	:	14
Papers accepted for publication	:	118
Training/awareness Workshops organized	:	12

Under AICIOPTAX Scheme, several new records of wild flora and fauna have been made. Several new species have also been discovered. These are being documented and verified with voucher specimens for authenticity before publication during the XI Plan Period. Discovery of species new to science will be the major impact of the AICOPTAX Scheme.

The Ministry, with the technical support from BSI & ZSI, has brought out 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), released as a showcase document by Government of India during the 10th Conference of Parties to the Convention on Biological Diversity held in October, 2010 at Nagoya, Japan.

The following five new thematic areas were recommended by the then Steering Committee for implementation during 2012-13:

- 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 (2012-13).

SFC Memo on AICOPTAX Scheme has been prepared and is being finalized in consultation with the Integrated Finance Division (IFD). An expert Group, as an independent 3rd party evaluation of the performance of the AICOPTAX Scheme during 11th Plan, is being constituted in consultation with IFD.

GOI-UNDP CCF-II project “Biodiversity Conservation through Community based Natural Resource Management”

Introduction

The project was initiated in October 2008 at an estimated budget of Rs 13.5 Crore (USD 3 million) for implementation in four states namely Arunachal Pradesh, Chhattisgarh, Jharkhand, and Odisha with following two objectives-

- To Facilitate the process of making the National and state-level policies and programmes more responsive to linkages between sustainable rural livelihood and biodiversity conservation
- 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.

Activities undertaken

The project was aimed at encouraging communities to take responsibility for managing their natural resources by recognizing the use of traditional and community knowledge for securing the biodiversity-based livelihoods. And the project also facilitates a process of making the national and state-level policies and programmes more responsive towards the linkages between rural livelihoods, biodiversity conservation and enhancement of capacities of communities and institutions of decentralized governance.

The project has been implemented in four states namely Arunachal Pradesh, Chhattisgarh, Jharkhand, and Odisha, covering 13 project sites and 122 forest fringed villages. The project started in September 2008 for a duration of three years and was subsequently further extended till 31st December 2012. These four states have large stretches of forest which links up the development of land, water and other natural resources that also promotes social and livelihood developed of communities living in and around villages. As these communities are dependent mainly on natural resources for their livelihood, development of alternative sources of income and other benefits related to food supplies, education and health assume importance in the success of the natural resource management approach.

Through community-based management of natural resources, the project has focused on components like conservation of species and habitats; ecological restoration; revitalization of indigenous knowledge, practice of customary rules and values for recognizing socio-economic and gender differences, nurturing existing

as well as new self-governing community institutions following principles of participatory decision-making, socio-economic equity and gender equality for access to common pool of resources.

Progress/Achievements made during the year

The *In-situ* conservation interventions were carried out in more than 23,000 ha area, 3 new nurseries including 2 high altitude established. More than 15 skill strengthening and capacity building programmes were organized in all four states. Fourteen Non Timber Forest Produce and agro-forestry based micro-enterprises established during previous year are also being supported and maintained during current financial year.

State-wise status (where applicable)

The details of state-wise physical progress made during the period are given below:

Arunachal Pradesh

- A community based institutional structure was initiated and later formalized into 22 Biodiversity Management Committees (BMCs) in 7 villages in Tawang site and 15 villages in Apatani site, and are now recognized by the State Biodiversity Board. These BMCs have been able to set up social norms for prohibiting hunting, illegal extraction and felling of forest resources from community conserved areas and sacred groves.
- More than 5000 ha area have been brought under Community Conserve Area (CCA), which are natural habitats of important plants and animals species and have special cultural and traditional significance in the lifestyle of local tribal communities- Apatanis and Monpas

- Relevant Guidelines on 'Home Stay and 'Management of Community Conserve Area (CCA) along with and Eco-Tourism policy' was prepared and is to be adopted by the State Government of Arunachal Pradesh in their state level forest management policy
- Promotion of community based eco-tourism has generated income of about Rs 8 lakhs over a period of two years per family and promotion of traditional agro-forestry practices has provided opportunity for local communities –Apatanis and Monpa's to earn their livelihood in a more efficient way.

Odisha

- Participation and involvement of the local communities and members of Village Sub-Committee (Gram Samiti) or Van Surakhsya Samiti (VSS) living within and around three forest division sites has propelled the process of community partnership in executing and monitoring implementation of project activities. Through capacity development of people's skills and making available local resources needed to make changes in lifestyle and livelihood options necessitated local communities to be empowered for conserving vulnerable sites with its native plants species such as Cane (*Calamus spp*). Based on *In-situ* and *Ex-situ* conservation operations including silviculture, fire-line operation and community led patrolling against illegal felling of teak trees was undertaken in an area of 100 ha in Khurda, 100 ha in Berhampur and 250 ha in Sambhalpur forest division
- Twenty three Self Help Group (SHGs) formed in 3 forest divisions to improve upon their skills and capacities in order

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to take up alternate livelihood activities such as agriculture and horticulture with ally cropping methods, other income earning activities- backyard poultry, pisciculture, tailoring, making incense sticks and candles, puffed rice, running grocery shop and to collectively manage community assets-farming implements, 5 Ponds, 1 Check dam, 1 irrigation channel constructed in each of the three project sites has ensured local communities to identify their own livelihood options. And by being oriented towards cross learning experiences facilitated by the project local communities have adopted to co-operative form of community based institutions like the self help groups, water's association and farmers clubs for managing and protecting the forests and having maximum stewardship over local natural resources.

Chhattisgarh

- About 71 plant variety of saplings, shrubs, herbs, climbers and wild grasses identified as threatened species yet important for its medicinal and minor forest produce value after surveying about 19241.284 hectares of forest area demarcated for special attention and conservation of biodiversity by the Chhattisgarh State Minor Forest Produce Cooperative Federation Limited and forest department in Chhattisgarh
- Awareness programmes conducted through celebration of various environment related

days through street plays, slogan writing etc. and also on organic certification involving tribal school children, members of Self Help Groups and cooperative federation & NGO's Government Officials and local communities in three sites.

- Ethno-botanical resource survey and documentation of flora species with herbal health value has been carried out systematical covering 326 sample plots. The survey data has been analyzed and uploaded in the software for wider use.
- *Ex-situ* conservation done within forest surroundings in Chhattisgarh to re-grow about 1,14,800 seedlings and saplings of threatened yet important medicinal plants- Giloe (*Tinospora cordifolia*), Aswagandha (*Withanea somnifera*), Sarpagandha (*Rauvolfia serpentina*), Satawar (*Asparagus racemosus*). Activities related to forming seed and grain bank has been started in all 3 sites
- Soil & Moisture conservation works i.e. boulder check dams, brushwood check dams, contour trenches have been constructed as per the requirement of the three project areas.



Fig-17. Resource survey at Jagdalpur site, Chhattisgarh

- Three Herbal Health care centres (Van Ausdhalaya) were strengthened and functioning well in all three sites with active participation of local vaidhyas. After the scientific validation of ethnobotanical survey report, four formulations were selected for further research with Central Council for Research in Ayurvedic Science, New Delhi for the development of new herbal products.
- Nine Self Help Group based micro-enterprises involving mainly Non Timber Forest Produce (NTFP) and forestry related activities were supported and are running well in all three sites.
- Trainings were imparted to Traditional Healers (Local Vaidhyas) with the help of AYUSH; and training for non-destructive harvesting of 49 Non Woody Forest Produce has been organized for traditional collectors from 3 forest division.
- Guidelines on “non-destructive harvesting practices of important Non Woody Forest Produce for Chhattisgarh” was developed by the project to provide a planning approach for conservation and sustainable use of Non Timber Forest Produce (NTPF) resources within conserved and protected areas.
- local communities about the rational for conservation action and livelihood benefits.
- A total of 114 families were supported with seed money for livelihood support activities including vegetables & Lac cultivation, cattle rearing, grocery etc,. In addition, out of these 56 families have repaid their seed money.
- Water conservation was initiated by constructing lift irrigation at Bokaro site and Palamau to benefit 44 acres and 40 acres of land respectively for cultivating food crops and fodder through BARI model of multitier cropping system. Revival and construction and excavation of 7 ponds for irrigation, 41 water harvesting structure (WHS) at project sites construction of 3 check dams has benefited 248 farmers to cultivate paddy with the system of rice intensification technique initiated at Trikut, Bokaro, Palamau and Khunti.
- Through the project charcoals made from dried Lantana weeds was initiated among the primitive tribe-Paraia in Palamau area of Jharkhand. Trainings demonstrated to them how dried weeds of *Lantana Camara* – an invasive weed- can be processed into charcoals and be used as a alternate fuel option of charcoal from wood and other plants. Paraia tribe of Matnag hamlet of Gari village was able to sell the charcoals of Lantana for Rs 10 to 15 a kilogram at the local village market.
- At the project site-Khunti, 410 Palash trees were identified within the demarcated village forest and inoculated with a variety of PHUNKI lac during project year 2011. Having inoculated brood lac on those Palash trees, the group was able to harvest in 2012 about 37 1/2 kgs of PHUNKI lac

Jharkhand

- Revival and maintenance of about 12 ha. of sacred grooves and Assisted Natural Regeneration (ANR) in 21 ha of community forest, 12 ha of village forest at Khunti site with about 1323 native tree species of Sal and Bhelwa and about 35016 tress species of Gambhar, Teak, Karanj, Kusum, Semal and plantation of Fuel wood & Fodder was completed in 144 ha at Trikut, 8 acre in Palamau site, 28 acre in Bokaro site, has generated awareness among

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variety and earned about Rs 7500/ in first round in 2012. At the village market each family sold the scrap lac (non mother insects) at a value of Rs 350 to 600 per kilogram and brood lac (mother insect) sold for Rs 1000 to 1500 per kilogram. The earned money was helpful to the group to start a lac management fund that is used by the group. In addition in 2012 about 1000 identified Palash trees were inoculated with PHUNKI lac. In addition about 20,000 non-traditional host specie called - *Flemenzia Semilata*, a shrubs was inoculated with brood lac. This new found host shrub has given a good yield of lac within 8 months. This year 2012 Self Help Groups of Khunti project site have started to manage seed banks and about 70 families were given about 1.25 to 1.5 quintal of brood lac to be inoculated on 25 to 40 trees on an average.

Budget allocation and progress of expenditure during 2012-2013:

The allocation of Rs 100 Lakhs was made during financial year 2012-2013 out of which ₹69.66 lakhs was released to the three identified implementing agencies.

Implementing organization

Ministry of Environment and Forests 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) was 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 National Steering Committee (NSC) lay's down the guidelines for the project implementation and reviews the progress periodically. The Empowered Project Steering Committee (EPSC) approves the Annual work plan and expenditure as per approved budget and provides feedback for review of progress by National Steering Committee (NSC). The state level coordinating agencies responsible for implementing project activities at identified 13 project sites involving beneficiaries of selected 122 forests fringed villages are: G.B. Pant Institute of Himalayan Environment & Development, N-E Unit, Itanagar, Arunachal Pradesh, Chhattisgarh State Minor Forest Produce (T&D) Cooperative Federation, Ltd Raipur, Chhattisgarh, Institute of Forest Productivity, Ranchi, Jharkhand and Regional Plant Resource Centre, Bhubaneshwar, Odisha.

Assistance to Botanic Gardens

The scheme was initiated in 1992 to augment facilities for ex-situ conservation of threatened endemic plants. The objectives of the Scheme include ex-situ conservation, multiplication and reintroduction of threatened endemic plants, seed banks, arboreta and mist propagation facilities, education, awareness etc. Under the scheme, 353 projects have been supported till December, 2012 for improvement of botanic gardens and Centers of ex-situ conservation which included 13 Lead gardens (Table-9). An allocation of ₹ 2.20 Crores have been made during the year and the entire allocation is likely to be spent. As per recommendation of Standing Finance Committee meeting held on 21.11.12 the Botanical Survey of India would be the implementing agency for the scheme.

Table-9. List of organizations provided assistance for maintenance of Lead Botanic gardens till September, 2012.

S. No.	Name of the Institution	Region	Date of Sanction	Total Amount Sanctioned (₹ in lakh)
1.	Prof. S.R. Yadav, Professor, Department of Botany Shivaji University, Kolhapur (M: 9421102350) E-mail: sryadavdu@rediffmail.com	North Western Ghat	2.9.2008	47.54
2.	Dr. L.R. Bhuyan, Systematic Botanist/Nodal Officer Van Vigyan Kendra, Chessa, Papompare, SFRI, Itanagar, Arunachal Pradesh Tel: 0360- 2203523 (M: 9862091717) E-mail: lrbsb2008@gmail.com, l_bhuyan@indiatimes.com	East Himalaya	23.09.08	57.00
3.	Dr. P.C. Panda, Sr. Scientist, Regional Plant Resources Centre Neyapalli, Bhubaneswar, Odisha Tel: 0674- 2557925 (M: 09439831495) E-mail: pcpanda2001@yahoo.co.in	Eastern Ghats	18.09.08	50.50
4.	Dr. Susheel Verma, Reader, Centre for Biodiversity Studies School of Biosciences and Biotechnology Baba Ghulam Shah Badshah University, Rajouri-185 131 J&K (M: 09419797202) E-mail: eremurus@rediffmail.com	Western Himalaya	29.05.09	57.50
5.	Dr. L.M. S. Palni, Director GB Pant Institute of Himalayan Environment and Development Institute of Himalayan Environment and Development, Kosi Katrmal, Almora, Tel: 05962-241015 (M: 09412092188) E-mail lmspalni@rediffmail.com, psdir@gbpihed.nic.in	Central Himalaya	25.03.08	34.68
6.	Dr. Suresh Kumar, Sr. Scientist Centre for Arid Zone Research Institute, Jodhpur, Rajasthan (M: 9414130030) E-mail sk_ecology@yahoo.com	Arid Zone	17.10.08	99.02
7.	Dr. A.K. Goel, Deputy Director & Head Botanic Garden National Botanical Research Institute Ranapratap Marg, P.B. No. 436, Lucknow-226001 (M: 09415025245) E-mail: anilkumar_goel@rediffmail.com	Gangetic Plains	03.06.09	41.94
8.	Dr. A.G. Pandurangan Tropical Botanic Garden and Research Institute, Palode Trivandrum -695 562 (M: 094434 11296) E-mail: agpandurangan@mail.com	South western Ghats	14.03.08	76.14
9.	Dr. S.J. Britto Rapinat Herbarium and Centre for molecular Systematics and the Anglade Institute if Natural History, St. Joseph College Thiruchellapalli-620 002 (M: 09443411296) E-mail: sjbritto@rediffmail.com	Western Ghats	22.09.08	66.45
10.	Dr. M.D. Raganna, Professor(Curator) Botanic Garden University of Agriculture Science, GKVK, Bengaluru -560 065 (M: 09448506061, 08028461833)	Western Ghats	03.07.09	52.44
11.	Sh. Rameshwar Das, Director Institute of Forest Productivity, Ranchi, NH-23, P.O. Lal Gutwa, Ranchi -835303 Tel: 0651-3296974, (M: 09431902837) E-mail: rdasifs@yahoo.co.in	Chotanagpur Plateau	20.05.11	44.00
12.	Malabar Botanical Garden, Kozikhode, Kerala	Western Ghat	July, 2012	35.00
13.	Aligarh Muslim University, Aligarh, Uttar pradesh	Northern Region	August, 2012	39.00

Performance/Achievement/progress made during the year

A comprehensive guideline on the scheme has been approved by SFC clearly explaining goals and objectives, need for lead gardens in different phytogeographic zone, Terms & Conditions, role of BSI, State and Central Govt. etc. Revised guidelines calls for promoting education awareness, ex-situ conservation and reintroduction of threatened plants in natural habitat

An allocation of ₹230 Lakhs have been made during 2012-13 and till Dec., 2012, ₹130.54 Lakhs have been spent on on-going projects and two new Lead Gardens which were supported under the scheme are listed below:-

- Malabar Botanical Garden, Kozikhode, Kerala
- Aligarh Muslim University, Aligarh, U.P.

The outlay for XII Plan is ₹20 Crore.



Fig-18. A view of Pukke Tiger Reserve at Arunachal Pradesh

Implementing agencies

The projects under the scheme are implemented by various Government/ Autonomous/ Non-Government Organizations maintaining Botanical Gardens and Centres 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 threatened endemic plants requiring ex-situ conservation. The implementing Agencies are institutions, organizations maintaining the Botanic Gardens. They are responsible for long term ex situ conservation of collected plants.

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 situated at Bengaluru, Bhopal, Bhubaneswar, Lucknow, Shillong and Chandigarh are empowered to grant approvals under the Forest Conservation Act (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. are 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. The FAC meets once a month. The FAC was reconstituted on 03.08.2012 and the present composition is as 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. Mohd. Firoz Ahmad	Member
(v)	Professor N P Todaria, HNB Garhwal University	Member
(vi)	Non-Official Member, Vacant	Member
(vii)	Inspector General of Forests (Forest Conservation), Ministry of Environment & Forests	Member-Secretary

In the cases where area is more than 100 ha., 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.

A Statement showing the number of cases received and cleared for diversion of forest land along with forest land diverted during the years 2011-12 and 2012-13 (up to January 2013) is given in **Table-10**.

During the year 2011-12, **451** proposals were closed/ returned/withdrawn owing to incomplete applications and rejections. Similarly till 31/01/2013 in the year 2012-13, **155** 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 2 hectares (ha) in each case, for a period of five years i.e. till 31st December, 2015. In addition, in the 60 worst affected districts where Integrated Action Plan is being implemented, the general approval for diversion of upto 5 ha of forest land for specified developmental activities has been given.

Table-10. Number of cases received and cleared for diversion of forest land

2011-12			2012-13 (upto 31.03.2013)		
No. of cases received	Approved		No. of cases received	Approved	
	No. of cases*	Forest area diverted (ha.)		No. of cases*	Forest area diverted (ha)
2,942	1,582	29,076	457	458	33278

* Includes cases received during the preceding years

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

Important Policy Decisions taken

- The Ministry has issued revised guideline to streamline the procedure for obtaining approval under the FC Act for diversion of forest land required for execution of linear projects such as roads, railways, transmission lines etc. The para 4.4 of the guidelines has been modified to allow execution of linear projects on non-forest land (subject to certain conditions) pending approval under the FC Act for diversion of forest land involved. This would apply to new projects as well as widening of existing roads
- Since most of the linear projects require Environmental Clearance (EC), even after the above, some projects will not be able to start work even in non-forest areas without obtaining EC. It has, therefore, been decided to seek approval of the Hon'ble Supreme Court to delink EC and FC for such projects so that after obtaining EC, work can be started in non-forest areas without waiting for Stage-I FC.
- The Ministry has also permitted submission and processing of proposals seeking approval under the FC Act for diversion of forest land required for linear projects Forest Division/state-wise as against requirement of consolidated proposal earlier.
- The guidelines on submission of evidences for having initiated and completed the process of settlement of rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 issued by the MoEF vide letter dated 03.08.2009 have been amended to exempt the proposals seeking prior approval of Central Government under the FC Act for projects like construction of roads, canals, laying of pipelines/ optical fibers and transmission lines etc. where linear diversion of use of forest land in several villages are involved, unless recognised rights of Primitive Tribal Groups and Pre-Agricultural Communities are being affected, from the requirement of obtaining consent of the concerned Gram Sabha(s),
- The general approval under the FC Act for diversion of forest land for creation of critical public utility infrastructure of 13 categories specified in the MoEF's letter dated 13.05.2011, by Government departments involving not more than 5.00 hectares of forest land in each case in 60 Left Wing Extremism affected districts identified by the Planning Commission

and the Ministry of Home Affairs for implementation of the Integrated Action Plan (IAP) has been extended to additional 22 districts identified for implementation of the IAP.

- The MoEF has requested all State/UT Governments to obtain, within a period of two years, approval under the FC Act for diversion of entire forest land located within the mining leases. EC cases of existing mining operations, where approval under the FC Act for the full forest area in the mining lease area is not available would be considered for the non-forest area plus the forest area within the mining lease for which FC is available. The project proponent will need to seek and obtain approval under the FC Act for diversion of entire forest land located within the mining lease within a period of two years from 01.02.2013.

Mechanism for Compensatory Afforestation

To 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 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 5 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 Committee headed by the respective Chief Secretaries and within the annual limit of ₹1,000 crores fixed by the Apex Court. The amounts released to the State CAMPAs in the years 2011-12 and 2012-13 (till 12.02.2013) are indicated in the Table-11. 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 5 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 National Informatics Centre (NIC) and Forest Survey of India. The fully operational e-green watch will facilitate

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Table-11. Amounts released to the State CAMPAs in the years 2011-12 and 2012-13 (till 12.02.2013)

Sl. No.	State/UT	2011-12		2012-13	
		Date	Amount (in ₹)	Date	Amount (in ₹)
1	Andaman & Nicobar Islands	18.06.2012	5,779,000		
2	Andhra Pradesh	23.08.2011	11,85,700,000	06.10.2012	1,19,60,39,000
3	Arunachal Pradesh	08.09.2011 25.10.2011 09.11.2011 29.11.2011	4,11,900,000	02.01.2013	11,76,13,000
4	Assam			13.02.2013	15,05,92,100
5	Bihar	25.11.2011	8,04,00,000	02.01.2013	8,46,50,000
6	Chandigarh				
7	Chhattisgarh	08.09.2011	99,54,39,000	21.08.2012	1,14,38,00,000
8	Dadra & Nagar Haveli	28.10.2011	15,36,000		
9	Daman & Diu				
10	Delhi				
11	Goa				
12	Gujarat	08.09.2011	26,30,00,000	09.11.2012	32,41,17,000
13	Haryana	11.06.2012	16,45,00,000		
14	Himachal Pradesh	23.08.2011 09.12.2011	57,12,62,400	02.01.2013	39,30,00,000
15	Jammu & Kashmir			29.11.2012	23,78,35,000
16	Jharkhand	24.11.2011	62,49,89,300	02.01.2013	47,98,00,000
17	Karnataka	30.08.2011 09.09.2011	41,57,00,000	06.10.2012	43,72,00,000
18	Kerala				
19	Lakshadweep				
20	Madhya Pradesh	09.01.2012	5,35,209,000		
21	Maharashtra	16.11.2011	8,26,300,000	06.10.2012	78,21,23,000
22	Manipur	11.06.2012	1,91,34,000		
23	Meghalaya				
24	Mizoram				
25	Nagaland				
26	Odisha	23.08.2011 04.06.2012	1,66,85,10,050	30.11.2012	2,05,82,44,000
27	Puducherry				
28	Punjab	16.09.2011 21.09.2011	22,07,83,872	27.08.2012	19,31,18,000
29	Rajasthan	11.11.2011	31,89,13,000		
30	Sikkim	02.09.2011 12.10.2011	9,04,00,000	27.11.2012	8,75,23,000
31	Tamil Nadu	12.06.2012	1,38,30,000	12.02.2013	54,08,950
32	Tripura			12.02.2013	2,27,70,300
33	Uttar Pradesh				
34	Uttarakhand	26.06.2012	65,31,60,000	02.01.2013	31,73,05,000
35	West Bengal	09.03.2012	4,84,36,000		
Total			9,11,48,81,622.00		

Note: The allocations to the State CAMPAs in Arunachal, Jharkhand, Tamil nadu and Uttarakhand have been made @ 50% of their respective entitlements for the year 2012-13 pending the receipt of GIS coordinates of work sites treated under CAMPAs funds since the year 2009-10, as requested in D.O. Letter No.13-5/2012-FC dated the 11th September, 2012 from DGF&SS to the PCCFs of all States/UTs. The allocation to Himachal Pradesh has been made @ 75% GIS coordinates have been received in port.

on-line real-time assessment of activities implemented from CAMPA funds, and will be an important monitoring tool. The Project has since been formally launched in Andhra Pradesh, and Karnataka. Forest Survey of India has organised Seminars, in association with the Forest Survey of India, for roll out of the Project in other States;

- 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, under the directions of the C&AG of India.

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 resulted 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 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:-

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- 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, Bengaluru
- 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, Bengaluru
- Wildlife Crime Control Bureau (WCCB) and its Regional Offices at ;-
 - Chennai, Southern Region
 - Kolkata, Eastern Region
 - Mumbai, Western Region,
 - Jablapur, Central Region
 - New Delhi, Northern Region
- Directorate of Forest Education (DFE) including following State Forest Colleges;-
 - Central Academy for State Forest Service, Dehradun (Uttarakhand)
 - Central Academy for State Forest Service, Coimbatore (Tamil Nadu)
 - Central Academy for State Forest Service, Burnihat (Assam)
 - Eastern Forest Rangers College, Kurseong (West Bengal)
 - National Zoological Park (NZP), New Delhi
 - Indira Gandhi National Forest Academy (IGNFA), Dehradun

Progress/Achievements made during the year

- Formulated the Recruitment Rules (RRs) for 27 Administrative posts and 45 Technical & Research posts of ICFRE as per 6th Central Pay Commission recommendation. Apart from this, some of the Recruitment Rules in respect of DFE, FSI, WCCB, NZP, IGNFA, Indian Institute of Forest Management (IIFM) and Indian Plywood Industries Research & Training Institute (IPIRITI) have also been amended.
- Formulated the Indian Council of Forestry Research and Education Pensioners Health Scheme (ICFREPHS), 2012.
- A Departmental Anomaly Committee was constituted under the Chairmanship of Joint Secretary (FE) on up-gradation of pay structure of Assistant Conservator of Forests and Forest Rangers of Andaman & Nicobar Islands. The Committee has submitted the report.
- A Committee was constituted to examine and propose the structuring of ICFRE under the Chairmanship of Dr. P.L. Gautam, Chairperson, Protection of Plant Varieties and Farmer's Right Authority, New Delhi.

Strengthening of Forests Division

Introduction

The Ministry of Environment & Forests has six Regional Offices located at Bengaluru, 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 5 hectare (ha.) (except mining and regularization of encroachments) and to process cases between 5 ha. and 40 ha. 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 2011-12 and 2012-13 (upto 31 December 2012) is given in Table-12.

Other Activities undertaken

Some of the important activities undertaken/held during 2012-13 (upto 31 December, 2012) are as follows:

- A meeting of officers and scientists of the Regional Offices was held on 5th November 2012, under the chairmanship of Secretary, Ministry of Environment and Forests where the functioning of the Regional Offices, both Forestry as well as Environmental functions, were reviewed.
- An interactive meeting on Forest (Conservation) Act, 1980 was organised on 29th June 2012 by the Regional Office at Bhubaneswar under the Chairmanship of the Additional Director General of

Table-12. 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

S. No.	Name of the Regional Office	2011-12			2012-13 (upto 31.12.2012)		
		No. of Cases Received	Approved		No. of Cases Received	Approved	
			No. of Cases*	Forest Area Diverted (ha.)		No. of Cases*	Forest Area Diverted
1	Bengaluru	74	40	196.42	45	21	64.86
2	Bhopal	265	166	1011.76	155	62	149.638
3	Bhubaneswar	64	53	743.2524	47	9	144.7786
4	Chandigarh	879	524	572.62484	592	480	433.02927
5	Lucknow	350	254	531.19	220	237	676.36
6	Shillong	105	143	525.51787	63	81	479.50636
	Total	1737	1180	3580.76511	1122	890	1948.17223

* Includes cases received during the preceding years

- Forests (FC) in the Ministry, to discuss various issues related to FC clearance and compliances. The meeting was attended by State Nodal Officers of Odisha, West Bengal, Bihar, Jharkhand, Andaman & Nicobar Islands and representatives of project authorities from the Eastern Region. The issues discussed included requirement of Differential Global Positioning System (DGPS) survey, expediting FC clearance proposals, mutation of non-forest land CA as protected forest by the State Governments, etc.
- The Regional Office, Bengaluru carried out inspection of Iron Ore mines in Goa with reference to Mining from Dumps and on the reported violations of Krishnapattinam Port in Andhra Pradesh.
 - The Additional Principal Chief Conservator of Forests (Central), Regional Office, Bengaluru has assisted the Committee constituted by the Hon'ble Supreme Court of India in their field visits to the mining areas of Goa State.
 - Regional Office, Bhubaneswar coordinated the visit of Expert Committee constituted by the Ministry for review of environmental clearance matter of POSCO Steel Pvt. Ltd.
 - Regional Office, Bhubaneswar through its officer (acted as member Secretary) represented a Committee coordinated by the Ministry, completed review and submitted report on 22.4.2012 to the Ministry in respect of "Development of Criteria and guidelines for categorization non-compliance in projects".
 - Regional Office, Bhubaneswar also organised an interactive meet on Environment Issues in Chromite Mining & Ferro-alloys Plants Sector on 11.09.2012.
 - An Inventorization of bird species of the Eastern Regional Office, Bhubaneswar has been made a total of 25 bird species have been recorded so far.
 - A small garden dedicated to indigenous fragrant plants has been developed in the office complex of Eastern Regional Office with 105 fragrant flowering plant species in ½ acre area. 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.
 - Vermi-composting facility has been set up in the campus of the Regional Office, Bhubaneswar for utilising total biodegradable domestic wastes. The manure generated from the vermin-composting is used in the campus gardens.

Financial Achievement

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

(₹ in crore)

Revenue Head			Capital Head		
BE 2012-13	RE 2012-13	Expenditure (upto 31.12.2012)	BE 2012-13	RE 2012-13	Expenditure (upto 31.12.2012)
11.05	11.80	8.69	0.50	0.50	0.22

Forest Policy

Forest Policy Division of Ministry of Environment & Forests (MoEF) deals with the National Forest Policy, 1988, Indian Forest Act, 1927 and its amendments including policy matters and legislative matters of other Ministries and State Governments related to forests. In addition Forest Policy Division deals with forest related Climate Change, biodiversity, Desertification issues, implementation of REDD+ etc. in Forestry Wing of MoEF and acts as a National Focal Division for the Forestry International Cooperation on United Nations Forum on Forests (UNFF), Asia Pacific Forestry Commission (APFC), and Committee on Forestry of FAO.

Subjects under Forest Policy & Forest International Cooperation

- National Forest Policy, 1988 including State Forest Policy matters, Policy issues on NTFPs/MFPs, Policies and legislation of other Central Ministries related to forests and Scheduled tribes.
- Indian Forest Act, 1927, State Forest Acts/ other Central Acts. Harmonization of IFA, 1927 with FRA, 2006 and PESA, 1996
- Facilitating implementation of FRA, 2006 (Nodal Ministry –MoTA).
- Rationalization of felling and transit regulation for trees grown on private land.
- Forests & Climate Change, REDD+, Biodiversity, Desertification in Forestry Wing.
- Coordinating implementation of Non-Legally Binding instruments on Forests.
- Division is Focal Point for UNFF, Committee on Forestry (COFO) of Food and Agriculture Organization (FAO) and Asia Pacific Forestry Commission (APFC)

- Bilateral/ Multilateral Forest International Cooperation

Forestry International Cooperation

- Convener of Consultative Group for International Negotiations on forestry matters for formulating the country's views on United Nations Forum on Forests (UNFF), COFO of FAO and APFC.
- National Focal Point for UNFF, COFO and APFC. Presently a country Report for 10th session of UNFF was submitted to UNFFS.
- Bilateral co-operation between India-US, India-China on forestry matter.

USAID|India Forest Plus Project

The Forest Policy Division is nodal division for USAID|India Project "PARTNERSHIP FOR LAND USE SCIENCE (FOREST-PLUS) PROJECT 2011-2015". The program intends to focus on reducing emissions from deforestation and forest degradation and enhanced sequestration through afforestation, conservation and sustainable management of forests. The Forest-Plus program contributes to the overall Assistance Objective of the Clean Energy and Environment Office i.e. 'accelerating transition to a high performing, low emissions, and climate resilient economy', by taking REDD+ actions to scale and enhancing climate resilient, GHG mitigation planning and programs. This will be achieved by working on two components 1) Sustainable Landscapes and 2) Low Carbon Development Strategies. The Forest-PLUS program will address sectoral barriers, build human and institutional capacity, develop and deploy improved scientific methods for carbon inventory and reference baselines, provide support to the Government of India to develop a low carbon development strategy for India, and actively engage stakeholders and create an enabling environment for REDD+ implementation in

2

India. The Forest-PLUS program will work with the Ministry of Environment & Forests at the federal level to support implementation of national policies and programs and will contribute to MoEF's efforts to establish and implement programs through collaboration with the new REDD+ Cell. The program will also look for active engagement with communities and local governments. The Components of the Project are given below:

- Component 1: Sustainable Landscapes
 - Tasks- 1:Improvement of management practices for ecosystem and sequestration.
 - Task-2: Development of improved methods to establish carbon inventories and reference baselines.
 - Task- 3: Analysis of social and economic incentives for REDD+ policy and practice.
- Sub-component: II: Deployment - *Scientific and Technical Results Piloted at Scale.*
 - Task 1: Establish Government and Stakeholder Dialogue and Communication Processes
 - Task 2: Engage Stakeholders Constructively in REDD+ Implementation.
 - Task 3: Human and Institutional Capacity development and strengthening of enabling environment

Activities undertaken

- **Rationalization of felling and transit regulation for trees grown on Private/ Non-Forest land:** Keeping in view the principal objectives of the National Forest Policy 1988 which envisages that one-third of the total land area of the country should be under forest or tree cover, 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 Shri A.K. Bansal, the then Addl. Director General of Forests (FC) with DIG, Forest Policy as Member Secretary on 20th July, 2011. The Committee has submitted its report which is available on the Ministry's website.

- The Ministry has been proactively involved in facilitating the Ministry of Tribal Affairs being Nodal Ministry for the implementation of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 commonly known as Forest Rights act 2006. Ministry of Tribal Affairs (MoTA) issued a guideline on 12.07.2012 regarding implementation of Forest Rights Act, 2006 and amendments to the Forest Rights Rules, 2008, which have been notified in Gazette of India on 19.7.2006. In this regard, Ministry of Environment & Forests has issued a letter on 15.01.2013 to the Principal Chief Conservator of Forests (PCCFs) of All State/UTs Forest Departments for taking appropriate action on Guidelines recently issued by MoTA on 12.7.2012 and FRA Amendment Rules, 2012 notified on 19.7.2012.
- Forest Policy Division has coordinated and proposed the comments on various matters especially on the "the Land Acquisition and Rehabilitation and Resettlement Bill, 2011.
- The Indian Forest(Amendment) Bill, 2012, a Bill further to amend the Indian Forest Act, 1927 relating to Section 68 regarding enhancing powers of forest officers to compound forest offences was introduced in Rajya Sabha in 2012 which was referred to the Department-related

- Parliamentary Standing Committee on Science & Technology, Environment & Forests headed by Dr. T. Subbarani Reddy. The Standing Committee presented the Report (231st Report) to the Rajya Sabha on 26.11.2012 and laid on the table of the Lok Sabha on 26.11.2012.
- The Division organized two side events during the XIth Meeting of the Conference of the Parties to Convention on Biological Diversity (CoP-XI CBD) held at HICC-HITEX Hyderabad from 8-19th October, 2012. These two side events were as under:
 - (a) Side event No 2532 on '**REDD+ Architecture and its relevance to Developing Countries**' on 11.10.2012 jointly with **The Energy Research Institute (TERI)**.
 - (b) Side Event No 2686 on '**Exhibition on Linkages Between Various Indian Festivals and Biodiversity**' on **12.10.2012**.
 - **REDD+ Workshops:** Organized two National and one Regional Workshops on REDD+ preparedness for capacity building and awareness raising of state forest departments and other stakeholders. 5 more Regional Workshops are to be organized in Nagaland, Karnataka, Uttar Pradesh, Gujarat.
 - Forest Policy Division has organised the celebration of World Forestry Day 2011 at India International Centre (IIC), New Delhi on 21st March, 2012 with the theme "Role of Forests in achieving the Millennium Development Goals" and with the objective to create awareness among public about the importance of forests in human well being as well as their critical role as life sustaining system. The programme was attended by Policy Makers, Foresters, NGOs, representatives from other departments and general public. Smt. Jayanthi Natarajan, Minister of State(I/C) for Environment & Forests presided over the function as Chief Guest. Dr. R.K. Pachauri, DG, TERI delivered the keynote on the occasion.
 - 3rd India-China Joint Working Group Meeting on Forestry under bilateral agreement between India and China on Forestry was held at New Delhi on 21.02.2012. The Priority areas for action programmes were identified on Forest Stock Inventory and Carbon, Forestry Research, REDD+ and LULUCF and Green Economy, NWFP, Bamboo Research, Capacity building and Wildlife Conservation and Protection. Both parties agree for Focal Points from both countries to carry forward the bilateral cooperation on forestry and wildlife.
 - Forest Policy Division has provided inputs on forestry matters to IC Division on Rio+20 Zero draft of the Outcome Document and DIG (Forest Policy) from Forestry wing participated with Indian Delegation led by Hon'ble Minister of State (I/C) for Environment & Forests in the Rio+20 United Nations Conference on Sustainable Development held in Brazil.
 - Indian delegation headed by DGF&SS attended the 21st Session of Committee on Forestry (COFO) of FAO held at Rome, Italy from 24-28 September, 2012. DIG, Forest Policy participated in Organisation led initiatives from September 19-21, 2012 at FAO, Rome.
 - National Workshop on Non Legally Binding Instrument on all types of Forests (Forest Instrument) was organized by Forest Policy Division of the Ministry with IGNFA from 12-14th December, 2012 at New Delhi.

- DIG Forest Policy participated in AdHoc Expert Group-2 on Forest Financing at Vienna, Austria from 14-18th January, 2013 organised by United Nations Forum on Forests. The Report of AHEG-2 will be placed before 10th Session of UNFF.

Empowerment of women/weaker sections matters

Joint Forest Management Programme implemented by the Forest Departments ensures participation of women in the JFM Committees, where they have an equal say in decision making process. Women even hold portfolios of Chairperson in many JFM Communities. Forest Departments under Eco-development Schemes have created Self Help Groups some of which are purely women groups and engaged in various activities for income generation and livelihood.

Forest Protection

Introduction

Forest Protection Division deals with the following subjects in the Ministry.

- All Issues relating to forest protection.
- Illicit felling of trees, deforestation & encroachment on forests land.
- Pest & disease attack relating to forest protection (excludes research aspect).
- Implementation of the Centrally Sponsored Intensification of Forest Management Scheme.

The Division also handles issues relating to the latest development and planning relating to Management of Forest Fire. The Division is also the focal point for the Crisis Management arising out of Forest Fire. The Division is also the nodal Division for co-ordinating with Planning Commission and Ministry of Home Affairs (MHA) in matters related to Forest Protection in respect of Left Wing Extremism areas.

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 component 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 Forest.

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.

The Annual Work Plans submitted by the State Forest Departments is scrutinized by a Screening Committee consisting of the following members:

Additional Director General of Forests (FC)	Chairman
Deputy Inspector General of Forests (NAEB)	Member
Deputy Inspector General of Forests (RT)	Member
Deputy Inspector General of Forests (WL)	Member
Deputy Inspector General of Forests (FPD)	Member
Director (Finance)	Member
Representative of Civil Construction Unit	Member

Outcome

The scheme has strengthened the State/ UT forest departments by way of creating infrastructure such as field offices, forest stations, residential facilities for frontline staff; construction of roads and patrolling paths etc. The Scheme has also helped the State Forest Departments in introduction of modern technology including use of GPS, GIS, PDA and other modern communication technologies for survey and field surveillance and reporting. The Scheme also provides for field vehicles, arms and ammunitions which are equally

important to increase the effectiveness of the field functionaries of the Forest Department.

Introduction of advanced technology is helping 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 (JFMCs) in forest protection. Presently, there are 2,74,134 JFMCs managing 6,71,427,57 million hectares of forest area involving 3,8,62,811 million people.

Performance of the Scheme in the 11th Five Year Plan

Performance of the Scheme during the 11th Five Year Plan period is represented in the statement in Table-13.

Major achievements on the activities under the Scheme in the XIth Five Year Plan Period is given in Table-14.

Table-13. Performance of IFMS in XIth Five Year Plan Period

Year	Plan Outlay	Budget Allocated (Rs Lakh)	Amount Released (Rs Lakh)
2007-08	Rs 600 Cr for the Plan Period	7165.00	6698.50
2008-09		13000.00	7461.39
2009-10		7600.00	6933.72
2010-11		6500.00	5685.35
2011-12		6500.00	6336.29
2012-13		6825.00	4273.96
Total	600.00	47590.00	37389.31

Table-14. Physical and Financial Achievement under IFMS in XIth Plan Period

S. No.	Items of Work	Units	Target		Achievement	
				Physical		Physical
1	Creation and Maintenance of Firelines (kms.)	kms.	5673	611648	3799	513061
2	Firewatch Towers	Nos	909	1476	708	316
3	Fire Watchers	Mandays	4306	1532362	2412	1201432
4	Assistance to JFMCs	Nos	1474	30891	1277	24873
5	Construction of Water Storage Structures (Nos.)	Nos	972	801	661	543
6	Firefighting equipment	LS	477	6348	284	4498
7	Fire Mapping/Fire Management Plan	Nos	124	651	64	474
8	Training & Awareness	LS	581	5149	418	2875
9	Construction of Boundary Pillars	Nos	11867	274685	10680	218998
10	Construction of Building	Nos	10210	3072	5466	1248
11	Component of MIS		155	889	121	512
12	Communication networks, wireless cell, phones etc	Nos	716	13319	552	8044
13	Arms and Ammunition	Nos	20626	27296	293	75754
14	Computer	Nos	574	1098	522	983
15	Vehicles	Nos	2445	747	1650	477
16	Publicity and Extension	LS	224	693	157	618
17	Roads	Kms.	2199	2798	1827	2617
18	Field Survey/boundary demarcation/enumeration	Kms.	2913	1292885	2025	1211513
19	Purchase of Material	LS	112	2363	75	1140
20	Equipment for survey and enumeration (GPS etc)	LS	567	1833	515	1564
21	GIS workstations including software	Nos	472	340	322	148

Plan Outlay of the Scheme in the XIIth Five Year Plan

The proposed allocation under the Scheme for the XIIth Five Year Plan period is Rs 1200 Cr. An increase in plan size was sought due to the following reasons.

The average expenditure in the last five years is ₹6184 lakhs under the scheme. Under the guidelines of the scheme, proposals for Annual Work Programme (AWP) submitted by the respective State Governments is discussed in the Screening Committee which makes recommendation for allocation of funds for the year. On review of the past records, it is found that State Governments have been submitting AWP's for an amount of ₹ 8 to 14 crores whereas the average allotment for States has been 2-3 times less. Requests for allotment according to the plans submitted by the states have been received by the division on many occasions during the meeting with representative of State Forest Departments, their argument being that the AWP's are prepared after identification of gaps for forest protection and specially in the area of Infrastructure development for frontline staff, communication and Information Technology (IT) and forest fire control.

As the demand for funds for forest protection far outstrips the allocation to the States in the previous years, the division has proposed enhancement of the annual plan size for the scheme to fulfill the following objectives:

- To address the gaps in forest protection as identified by the State Governments.
- Given a fillip to the efforts in creating infrastructure facilities for frontline staff in the time bound manner so that presence of staff in forest area is enhanced leading to better vigil of forests.

- To create a strong system of Forest Fire Control and Management through the National Fire vulnerability map and subsequent mitigation measures, modernization of preventive measures for fire protection, use of modern communication facilities for forestry personnel and use of modern technology in identifying and accessing status of protection for valuable and vulnerable forest areas.
- To take action for Control of forest invasive species.
- For demarcation of boundary and fixing of boundary pillars which is very essential and needed to be completed immediately in time bound manner.

However, the performance of the Scheme also depends upon the capacity of the States and UTs to execute the scheme and be able to spend the funds within time limit.

Performance of the Scheme in 2012-13

The Annual Plan allocation for the year 2012-13 was Rs 68.25 Cr which was reduced to



Fig-19. Riverstream in Himachal Pradesh

Table-15. State wise performance under IFMS in 2012-13

S. No.	States	Amount Released	Amount reserve for 2nd instalment	Total Amount
1	Andhra Pradesh	-		0.00
2	Bihar	-		0.00
3	Chhattisgarh	398.03	124.82	522.85
4	Gujarat	164.12	123.32	287.44
5	Goa	7.51		7.51
6	Haryana	75.10	20.57	95.67
7	H.P	226.12		226.12
8	J & K	209.86		209.86
9	Jharkhand	80.71	131.80	212.51
10	Karnataka	281.60	79.49	361.09
11	Kerala	150.68		150.68
12	M.P	709.21	177.66	886.87
13	Maharashtra	-	269.42	0.00
14	Odisha	149.79	123.32	273.11
15	Punjab	0.00		0.00
16	Rajasthan	184.30		184.30
17	Tamil Nadu	141.00		141.00
18	U.P.	99.93		99.93
19	Uttarakhand	342.62		342.62
20	West Bengal	71.09		71.09
	Total	3291.67	1050.40	4342.07
North Eastern States				
1	Assam	-		0.00
2	Arunachal Pradesh	-		0.00
3	Manipur	117.51		117.51
4	Meghalaya	144.64		144.64
5	Mizoram	213.11		213.11
6	Nagaland	-		0.00
7	Sikkim	-	35.28	0.00
8	Tripura	323.88	53.020	376.90
	Total	799.14	88.3	887.44
Union Territories				
1	A & N Islands	5.49		5.49
2	Chandigarh	-		0.00
3	D&N Haveli	-		0.00
4	Daman & Diu	-		0.00
5	Lakshadweep	-		0.00
6	Delhi	-		0.00
7	Puducherry	-		0.00
	Total	5.49	0.00	5.49
	Grand total	4096.30	1138.70	5235.00

Table-16. Comparison of performance under IFMS in 2011-12 and 2012-13

(₹ in Lakhs)

Year	BE	RE	Expenditure
2011-12	6500.00	6500.00	6370.19
2012-13	6825.00	5325.00	4284.03*

*Expenditure upto 22nd January 2013.

₹ 53.25 Cr at the RE stage. Statewise allocation of the budget, as per RE, is given in Table-15.

Forest Fire Vulnerability Mapping

The Ministry through Forest Survey of India, Dehradun has initiated the exercise of preparation of Forest Fire Vulnerability Map for the forest area of the country. This map is being shared with the States with the objectives of helping them in better management, improved preparedness and timely intervention by State Forest Department in controlling forest fire and reducing damage arising out of it.

The Near Real Time Forest Fire Information system is also being executed by FSI wherein fire spots within the forest areas in the country is being shared with respective State Forest Departments by email/ sms in real time. This information sharing has improved fire management as well as trueness of fire information in the country.

Crisis Management Plan

The Forest Protection Division is also the nodal Division for preparation and implementation of Forest Fire Crisis Management Plans which are being prepared by the State Forest Departments. The aim of the Crisis Management Plan (CMP) is to improve co-ordination between various wings in the Government for quick and effective response to any emergency created due to forest fire. The plan includes mechanism for co-ordination among various agencies, preparedness plan

and as well as evaluation of the plan after fire season. This exercise is ongoing and expected that the forest department is able to provide adequate resources for forest fire control.

Comparison of achievements/progress 2012-13 vis a vis that in 2011-12

The statement summarizes the performance of IFMS in 2012-13 vis-à-vis in 2011-12 is given in Table-16. The budgetary allocation of the scheme was reduced to ₹53.25 Crore in the RE during the year 2012-13.

Implementing agencies along with detail of responsibilities

Implementation of the Scheme is being done as per the Memorandum of Understanding (MoU) signed between the Centre and State. State Forest Department headed by Principal Chief Conservator of Forests is the implementing agency for the Scheme. The main responsibilities of the implementing agencies is to submit Annual Work Plan proposal for sanction to the Screening Committee under the Scheme, supervise and implement the scheme as per the operational guidelines, conduct monitoring and evaluation and submit reports as required under the Scheme guidelines from time to time. The State Government is also required to furnish Utilization Certificate and progress report at the end of the financial year.

Under the Central Sector component of the Scheme, the Forest Protection Division of

the Ministry of Environment & Forests would implement the works of monitoring, evaluation and other such works which are spread over more than one State/Union Territory.

The Implementing agency are also expected to plan and implement the Scheme keeping in view that the activities proposed to be executed under the scheme is able to improve the status of protections of the target forest area.

Funds for the Scheme are directly transferred to the State Government for implementation.

Monitoring and Evaluation

The Division has initiated the third party evaluation of the Scheme through an independent agency for the works undertaken in the XIth Five Year Plan period where it is proposed to cover all the states and verify twenty percent of the sample of works undertaken.

Wildlife Conservation

Introduction

The Wildlife Wing has two Divisions, namely, Project Elephant Division and Wildlife Division, each headed by an officer in the rank of Inspector General of Forests. A Deputy Inspector General of Forest (Wildlife) and an Assistant Inspector General and Joint Director (Wildlife) provide administrative and technical support to the Wildlife Wing. In addition, there are three autonomous bodies, Wildlife Institute of India (WII) for wildlife research & training, Central Zoo Authority (CZA) for conservation and zoo management and National Tiger Conservation Authority (NTCA). The NTCA has been constituted by converting the Project Tiger Directorate into an autonomous body for tiger conservation. The National Zoological

Park in the capital is also a part of the Wildlife Wing of the Ministry of Environment & Forests.

To combat wildlife related crimes, a Wildlife Crime Control Bureau under the Director, Wildlife Preservation has been constituted with 5 Regional Offices viz, Delhi, Mumbai, Kolkata, Chennai and Jabalpur and 3 Sub-regional offices at Amritsar, Guwahati and Ramanathapuram.

Wildlife Division of the Ministry provides technical and financial support to the State/ UT Governments for wildlife conservation under the Centrally Sponsored Scheme - Integrated Development of Wildlife Habitats 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 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 given in Table-17.

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 (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)
- Protection of Wildlife Outside Protected Areas

Table-17. Summary of Protected Area Statistics in India (as on 05.09.2011)

States/UTs	No of NPs	Area km ²	No. of WLS	Area km ²	No. of C.R.*	Area km ²	No. of C.R.**	Area km ²	No. of PAs	Area km ²
Andhra Pradesh	6	1388.39	21	11618.12					27	13006.51
Arunachal Pradesh	2	2290.82	11	7487.75					13	9778.57
Assam	5	1977.79	18	1932.01					23	3909.80
Bihar	1	335.65	12	2851.67					13	3187.32
Chhattisgarh	3	2899.08	11	3583.19					14	6482.27
Goa	1	107.00	6	647.91					7	754.91
Gujarat	4	479.67	23	16619.81	1	227.00			28	17326.48
Haryana	2	48.25	8	233.21	2	48.72			12	330.18
Himachal Pradesh	5	2271.38	32	7745.48					37	10016.86
Jammu & Kashmir	4	3925.00	15	10243.11	34	829.75			53	14997.86
Jharkhand	1	226.33	11	1955.82					12	2182.15
Karnataka	5	2472.18	22	4003.42	2	3.80	1	3.12	30	6482.52
Kerala	6	558.16	16	1822.86			1	1.50	23	2382.52
Madhya Pradesh	9	3656.36	25	7158.41					34	10814.77
Maharashtra	6	1273.60	35	14152.70	1	3.49			42	15429.79
Manipur	1	40.00	1	184.40					2	224.40
Meghalaya	2	267.48	3	34.20					5	301.68
Mizoram	2	150.00	8	1090.75					10	1240.75
Nagaland	1	202.02	3	20.34					4	222.36
Odisha	2	990.70	18	6969.15					20	7959.85
Punjab	0	0.00	12	323.70	1	4.95	2	16.07	15	344.72
Rajasthan	5	3947.07	25	5379.26	3	222.27			33	9548.60
Sikkim	1	1784.00	7	399.10					8	2183.10
Tamil Nadu	5	307.85	21	3521.95	1	0.03			27	3829.83
Tripura	2	36.71	4	566.93					6	603.64
Uttar Pradesh	1	490.00	23	5221.88					24	5711.88
Uttarakhand	6	4915.44	6	2418.61	2	42.27			14	7376.32
West Bengal	5	1693.25	15	1203.28					20	2896.53
Andaman & Nicobar	9	1153.94	96	389.39					105	1543.33
Chandigarh	0	0.00	2	26.01					2	26.01
Dadra & Nagar Haveli	0	0.00	1	92.16					1	92.16
Daman & Diu	0	0.00	1	2.19					1	2.19
Delhi	0	0.00	1	27.82					1	27.82
Lakshadweep	0	0.00	1	0.01					1	0.01
Puducherry	0	0.00	1	3.90					1	3.90
India	102	39888.12	515	119930.5	47	1382	4	21	668	161221.59

*Conservation Reserve ** Community Reserve

- Recovery programmes for saving critically endangered species and habitats.

Support to Protected Areas (PAs)

- **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 16 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, Swamp Deer and Jerdon's Courser.

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:

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 11th Five Year Plan, total outlay approved for the Scheme was ₹ 800.00 crores of which ₹ 362.00 crores were allocated under the Scheme. The Ministry has released ₹ 360.162 crores under the Scheme during 11th Plan period. Year-wise detail of funds released during 11th Plan period under this scheme is shown in Table-18.



Fig-20. Weaver ants (*Oecophylla*) capturing pollinators on Goolar Fig (*Ficus racemosa*)

Table-18. Details of Funds Released under the Centrally Sponsored Scheme “Integrated Development of Wildlife Habitats” during XIth Five Year Plan

(₹ In Lakhs)

Sl. No.	Name of the State/UTs	2007-08	2008-09	2009-10	2010-11	2011-12
1.	A& N Islands	82.86	73.48	85.91	87.872	127.06
2.	Andhra Pradesh	168.0553	92.378	102.02	64.341	71.50
3.	Arunachal Pradesh	125.05	193.31	193.14	213.197	168.11
4.	Assam	81.775	161.095	114.79	186.63	234.17
5.	Bihar	4.00	37.558	42.29	19.889	00
7.	Chhattisgarh	379.197	323.235	851.15	281.966	241.783
8.	Chandigarh	0.00	00	00	12.29	19.98
9.	Dadra & Nagar Haveli	11.78	15.62	14.88	00	00
10.	Goa	31.59	41.94	71.03	32.879	21.458
11.	Gujarat	332.084	318.52	426.10	1106.749	1126.589
12.	Haryana	70.03	86.02	17.22	15.114	28.70
13.	Himachal Pradesh	233.319	241.983	265.92	253.80	242.1104
14.	Jammu & Kashmir	221.54	470.87	375.397	537.336	445.085
15.	Jharkhand	98.128	99.753	80.267	63.64	64.2615
16.	Karnataka	630.643	625.1501	566.71	412.252	335.851
17.	Kerala	493.574	864.96	432.48	366.786	941.79
18.	Madhya Pradesh	800.915	613.34	541.98	635.366	506.164
19.	Maharashtra	331.32564	390.22	273.679	343.32	322.391
20.	Manipur	105.8948	100.095	118.31	88.316	86.65
21.	Meghalaya	64.88	58.007	59.75	58.03	43.80
22.	Mizoram	169.46	289.09	186.85	707.763	153.445
23.	Nagaland	19.11	28.415	34.115	33.595	30.333
24.	Odisha	357.081	576.88	390.95	315.331	331.2651
25.	Punjab	0.00	40.29	36.26	25.12	00
26.	Rajasthan	347.24	414.58	496.746	348.068	291.387
27.	Sikkim	159.22	187.73	240.93	183.78	131.793
28.	Tamil Nadu	274.64	727.91	518.67	334.449	256.027
29.	Tripura	36.00	0.00	13.00	2.84	00
30.	Uttar Pradesh	332.362	307.173	274.45	296.179	204.371
31.	Uttarakhand	76.671	216.09	145.08	134.90	201.144
32.	West Bengal	356.215	345.78	381.318	276.385	246.425
33.	Delhi	0.00	0.00	0.00	00	00
34.	Daman & Diu	4.721	6.12	6.05	00	00
	TOTAL	6399.36074	7947.5921	7357.442	7438.183	6873.643

During 11th Plan period, evaluation of 58 PAs was carried out by a panel of experts using international protocols. The Management Effectiveness Evaluation (MEE) score of the 58 PAs is as follows: Very Good (9 PAs); Good (22 PAs); Satisfactory (19 PAs) and Poor (8 PAs).

During 12th Five Year Plan, total outlay approved for the Scheme is ₹ 800.00 crores of which ₹ 73.50 crores has been allocated during 2012-13. State-wise detail of funds released during 2012-13 under this scheme is given in Table-19.

Out of 16 species identified for the species recovery programme, financial assistance has been provided for nine species. The amount provided to the State/Union Territory in respect of these species is as below:

- **Project Snow Leopard** - (J&K – ₹169.20 lakh, Uttarakhand – ₹86.40 lakh, Himachal Pradesh- ₹164.696 lakh and ₹ 3.20 lakhs to Arunachal Pradesh)
- **Project Hangul** - (J&K – ₹ 268.56 lakh)
- **Project Vulture** – (Haryana – ₹ 43.60 lakh, Punjab – 18.40 lakh, Gujarat – ₹12.30 lakh)
- **Project Sanghai Deer** – (Manipur – ₹33.96 lakh)
- **Project Edible nest swiftlet** – (A & N Islands – ₹92.402 lakh)
- **Project Nilgiri Tahr** (Tamil Nadu- ₹ 4.80 lakhs)
- **Project Dugong** (A&N Islands-₹ 18.61 lakh)
- **Project Lion** (Gujarat-₹ 1350.40 lakh)
- **Project Wild Buffalo** (Chhattisgarh – ₹ 13.75 lakh).

Financial assistance has also been provided to the States for relocation of communities from within PAs to areas outside. Details of such assistance are as follows:

Table-19. Details of Funds Released under the Centrally Sponsored Scheme “Integrated Development of Wildlife Habitats” During 2012-13 (Upto 31.1.2013)

(₹ in Lakhs)

Sl. No.	Name of the State/Uts	2012-13 (Upto)
1.	Andaman & Nicobar Island	109.50
2.	Andhra Pradesh	180.335
3.	Arunachal Pradesh	162.3755
4.	Assam	146.00
5.	Bihar	64.685
6.	Chhattisgarh	362.38
7.	Goa	148.12
8.	Gujarat	517.926
9.	Haryana	37.60
10.	Himachal Pradesh.	318.9668
11.	Jammu & Kashmir	515.957
12.	Jharkhand	81.6195
13.	Karnataka	408.2648
14.	Kerala	426.08
15.	Madhya Pradesh	467.707
16.	Maharashtra	403.885
17.	Manipur	73.925
18.	Meghalaya	22.08
19.	Mizoram	77.11
20.	Nagaland	25.855
21.	Odisha	368.2084
22.	Rajasthan	413.00
23.	Sikkim	177.579
24.	Tamil Nadu	237.66
25.	Uttar Pradesh	263.78
26.	Uttarakhand	220.27
27.	West Bengal	164.135
	TOTAL	6395.004

- ₹ 540.00 lakhs has been released to Chattisgarh for relocation of 135 families from villages in Barnawapara Sanctuary during 2009-10.
- ₹ 550.00 lakh has been released to Kerala for relocation of 55 families from Wayanad Sanctuary during 2011-12.
- ₹488.00 lakh has been released to Mizoram for relocation of 61 families from Dumpui 'S' village in Thorangtlang Sanctuary 2010-11.
- ₹ 30.00 lakh has been released to Kerala for relocation of 3 families from **Malabar Wildlife Sanctuary during 2011-12.**

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 inter-Governmental commitments under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

International trade in wild flora and fauna including the species covered under CITES, is regulated by the provisions of the EXIM Policy. Relevant parts of EXIM Policy are based on the legal provisions of the Wild Life (Protection) Act, 1972 and provisions of CITES. The Director (Wildlife Preservation) is designated as the CITES Management Authority and the Regional Deputy Directors (WCCB) are the Assistant Management Authorities for CITES implementation. The function of these offices is to monitor and regulate international trade in wildlife and wildlife articles at the designated ports of exit and entry i.e Mumbai, Kolkata, Delhi, Chennai, Cochin, Amritsar and Guwahati. In addition to the periodic reviews

by the regional offices of Wildlife Preservation, an Annual Report is published as per the requirement of CITES. Consequent upon creation of Wildlife Crime Control Bureau, these regional and sub-regional offices have been merged in the Bureau.

The scheme "Strengthening of Wildlife Division and Consultancies" (Control of Wildlife Crime) support the expenses of the Wildlife Crime Control Bureau and its regional offices located in Delhi, Jabalpur, Mumbai, Kolkata and Chennai to ensure adequate manpower and development of infrastructure for better enforcement of Wild Life (Protection) Act, etc. Assistance is also extended to the three sub regional offices at Guwahati, Amritsar and Cochin which were established subsequently to further strengthen the organization.

Besides, research proposals from independent research agencies and institutions on applied aspects of Wildlife Conservation in India are also provided support under this scheme. During 2012-13, two new research projects and five ongoing projects were supported under the scheme.

An amount of ₹ 6.30 crores has been allocated under this Scheme for the year 2012-13 of which ₹ 3.96 crores has been utilized till 31.12.2012.

Important initiatives taken by the Wildlife Division of the Ministry

Declaration of Eco-sensitive Zones

As per the decision of the National Board for Wild Life taken in its 2nd Meeting held on 17th March 2005, the State Governments were requested to forward site specific proposals for declaration of Eco-sensitive zones around Protected Areas. The Ministry of Environment and Forests framed guidelines for facilitating the State/Union Territory Governments for

declaration of eco-sensitive zones around National Parks and Sanctuaries, and issued the same vide O.M. No. 1-9/2007 WL-I dated 9 February 2011. Subsequently, draft notifications with respect to eco-sensitive zones around National Parks and Sanctuaries in the States of Haryana (9 no), Jharkhand (1 no.), Karnataka (1 No.) and Gujarat (4 no.) have been issued. The final notification of eco-sensitive zone around Sultanpur National Park, Haryana and around Dalma Sanctuary, Jharkhand have already been issued.

Advisory on Mobile Towers

The Ministry of Environment and Forests had constituted an Expert Committee to look into the 'Impact of mobile towers on birds and bees' under the chairmanship of Dr Asad Rahmani, Director, Bombay Natural History Society (BNHS) on 30th August August 2010. The Expert Committee had submitted its report to the Ministry. The review of the available scientific information by the Expert Committee in the report indicates that the Electro-Magnetic Radiations (EMR) interferes with biological systems. On the basis of the report and subsequent deliberations with stakeholders, an advisory has been issued by the Ministry on 9th August 2012. The main objective of the list of activities indicated in the advisory is to avoid, and mitigate the impacts of EMR. The report of the expert committee has been submitted to the Ministry of Environment and Forests.

The review of the available scientific information by the Expert Committee in the report indicates that the Electro-Magnetic Radiations (EMR) interfere with the biological systems. On the basis of the report of the Expert Committee and subsequent deliberations with the stakeholders, a list of actions to be undertaken by various agencies involved in

providing, regulating, and dealing in any other manner with, the EMR based services, has been prepared. Main objective of the listed actions is to avoid and mitigate the impacts of EMR. The Ministry of Environment and Forests accordingly requests the concerned Departments, State Governments, user agencies, and the public at large to take following actions:

Ministry of Environment and Forests

- The Electro Magnetic Radiations from the communication towers may have varying negative impacts on wildlife especially birds and bees. Accordingly, the information on the impacts related to different forms of wildlife as well as humans, should be provided to the concerned agencies for regulating the norms for notification of standards for safe limits of EMR taking into consideration the impacts on living beings.

II. State/Local Bodies

- Regular auditing and monitoring of EMR should be conducted in urban localities/ educational/hospital/ industrial/residential/recreational premises and especially around the Protected Areas (PAs) and ecologically sensitive areas w.r.t. notified norms of Department of Telecommunications. Problematic towers from EMR point of view should be got suitably relocated/ removed.
- Bold signs and messages on the dangers of cell phone towers and associated radiations are displayed in and around the structures of the towers. In addition to these signs, use of visual daytime markers in areas of high diurnal raptor or waterfowl movements, should also be promoted.

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- Before according permission for construction of towers, ecological impact assessment and review of installation sites will be essential in wildlife and/or ecologically important areas. The Forest Department should be consulted before installation of cell phone towers in and around PAs and zoos.

III. State Environment and Forest Departments

- Regular awareness drive with high level of visibility through all forms of media, and in regional languages should be undertaken by the State Governments and concerned Departments to make people aware about various norms and standards with regard to cell phone towers and dangers of EMR from the same. Such notices should also be placed in all wildlife protected areas and zoos by the Forest Department.

IV. Department of Telecommunications

- To prevent overlapping of high radiation fields, new towers should not be permitted within a radius of one kilometre of the existing towers. Sharing of passive infrastructure if made mandatory for Telecom Service Providers can minimize need of having additional towers. If new towers must be built, these should be constructed with utmost care and precautions so as not to obstruct flight path of birds, and also not to increase the combined radiations from all towers in the area.
- The location and frequencies of cell phone towers and other towers emitting EMR, should be made available in public domain. This can be at city/ district/ village level. Location-

wise GIS mapping of all cell phone towers should be maintained which would, *inter alia*, help in monitoring the population of birds and bees in and around the mobile towers and also in and/or around wildlife protected areas.

- There is an urgent need to refine the Indian standard on safe limits of exposure to EMR, keeping in view the available literature on impacts on various life forms. Till such time the Indian standards are reformed, a precautionary approach shall be preferred to minimize the exposure levels and adopt stricter norms possible, without compromising on optimum performance of the networks.

V. All concerned agencies

- Security lighting for on-ground facilities should be minimized, and as far as possible, point downwards or be down-shielded to avoid bird hits.
- Any study conducted on impact of EMF radiation on wildlife needs to be shared with Forest Department and Department of Telecommunications to facilitate appropriate policy formulations.

Declaration of Critical Wild life Habitats

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 was enacted in 2006. The Act has been enacted to recognize and vest the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generation but whose rights could not be recorded, and to provide for a framework for recording the forest rights so

vested and the nature of evidence required for such recognition and vesting in respect of forest land. The Rules under the Act have been notified on 1 January 2008.

The Ministry of Environment and Forests had framed 'Implementation Protocol' for determination and notification of Critical Wild Life habitats in National Parks and Sanctuaries, and for facilitating the implementation of the provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The draft 'Implementation Protocol' was hosted on the official website of the Ministry of Environment and Forests inviting comments from the public. After incorporating the comments so received appropriately, the draft protocol was forwarded to the Ministry of Tribal Affairs for their comments/vetting. The Ministry of Tribal Affairs have recently offered their comments on the draft protocol, which are being examined. The draft protocol would also be placed before the Standing Committee of NBWL for its consideration, before finalizing and circulating to the State/Union Territories.

International Cooperation

India is a party to five major international conventions related to Wild Life conservation, viz., Convention on International Trade in Endangered Species of wild fauna and flora (CITES), International Union for Conservation of Nature and Natural Resources (IUCN), International Whaling Commission (IWC), United Nations Educational, Scientific and Cultural Organization-World Heritage Committee (UNESCO-WHC) and the Convention on Migratory Species (CMS).



Fig-21. Black necked Stork (*Ephippiorhynchus asiaticus*) – needs conservation

Convention on International Trade in Endangered Species of Fauna and Flora (CITES)

In order to regulate international trade in endangered species of Wild Life, the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) was signed in March 1973.

The Government of India signed the Convention in July 1976, which was ratified in October 1976. The Director, Wild Life Preservation has been designated as the CITES Management Authority for India. The enforcement of the provisions of CITES is carried out by the Regional Deputy Directors, Wild Life Crime Control Bureau, who have also been designated as the Assistant CITES Management Authority for India. Apart from the Regional Deputy Directors, the Customs Authorities, State Forest Departments are also involved in the enforcement of the Convention. An amendment to the Wild Life (Protection) Act 1972 has been proposed for integrating the provisions of CITES in the national law for effective implementation of the Convention. The Ministry of Environment and Forests has also constituted a CITES Cell on 10th September 2010 to assist the Government of India in CITES implementation. India has taken several

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initiatives in recent years at national level to build capacity for better CITES implementation in the country.

Indian delegation has participated in the meetings of the Plants and Animal Committees, the meetings of the Standing Committee and in Conferences of Parties of CITES from time to time. Following specific agendas have been pursued in this convention in recent times.

- A recommendation for suspension of trade from India was made by the 59th Standing Committee of CITES, *inter alia*, in respect of *Pterocarpus santalinus* and *Taxus wallichiana* in view of certain gaps in information. Suspension of Trade on *Taxus wallichiana* was lifted by CITES after convincing interventions by India in 61st Standing Committee Meeting in August 2011. Later, India conducted a comprehensive NDF study on the species through one of its CITES Scientific Authorities. This Non Detrimental Findings (NDF) study ended in November 2011 and same has since been submitted to the CITES Secretariat along with the report of the CITES MA of India on the subject. In the report it has been recommended that no harvest from wild populations will be allowed till 2016 when an inventory and assessment of stocks in wild as well as in planted populations will be made for further management of these populations. Based on the report submitted by India, the CITES has revoked its suspension of trade decision and has since permitted trade of the confiscated material and a limited quantity of 310 MT annually from the artificially propagated populations from the private holdings in July 2012.
- India headed a Working Group on revision of the Resolution Conf. 10.10 (Rev. CoP15)

on 'Trade in Elephant Specimens' for effecting improvements in the resolution that aims to conserve the wild elephant populations of the world. The decision of COP 15 was pursued and a revised draft was submitted to CITES accordingly. The draft would be discussed in COP 16 in Bangkok.

- India had emphasized the need for strengthening of enforcement, and requested the Tiger Range States to comply with the decisions of the CITES COP-14.

IUCN : World Conservation Union

The International Union for Conservation of Nature and Natural Resources (IUCN) -World Conservation Union is the world's international "umbrella" organization established in 1948. IUCN has a membership of more than 1,000 government and NGO member organizations, and almost 11,000 volunteer scientists in more than 160 countries. India has a long relationship with IUCN. BNHS is the first organization in India to join IUCN as a member followed by the Indian Board for Wild Life and the Ministry of Environment and Forests. At present there are 29 members of IUCN in India including the Ministry of Environment and Forests, National Board for Wild Life, Wild Life Institute of India and Indian Institute of Forest Management. The launch of Project Tiger in India in 1973 was the outcome of the IUCN General Assembly meeting in Delhi.

- IUCN Red Listing

The IUCN Red List of Threatened Species (also known as the IUCN Red List or Red Data List), founded in 1963, is the world's most comprehensive inventory of the global conservation status of plant and animal species. The IUCN Red List is set upon the precise criteria to evaluate the extinction risk of thousands of species and subspecies in order to convey the

urgency of conservation issues and to help the international community to deal with threat of species extinction.

It was considered to align the red listing process of the national institution with that of IUCN. Accordingly, a consultative workshop was jointly organized by the Ministry of Environment and Forests and the IUCN -India on 1st February 2011 to consider this possibility. As an outcome of this workshop, the Ministry of Environment and Forests constituted a Steering Committee for guiding the task. Botanical Survey of India (BSI) and the Zoological Survey of India (ZSI) have been made the nodal agencies for undertaking the assessments on flora and fauna respectively, in coordination with other concerned organizations, and IUCN, etc.

– IUCN Council Meeting in India

The IUCN Council is the principal governing body of IUCN in between sessions of the World Conservation Congress which is the General Assembly of IUCN members. It mirrors the functions of an Executive Board of a Corporation in terms of having management and administrative responsibilities. The Council is responsible for the overseeing and general control of all the affairs of IUCN, subject to the authority of the World Conservation Congress.

In a major initiative towards international conservation, India hosted the Council meeting of IUCN, at New Delhi from 14-17 November 2011. The IUCN Council meeting, which usually takes place twice a year in Gland, Switzerland, was held in India as a prelude to the 11th Conference of Parties of the Convention on Biodiversity, which was held in Hyderabad in October 2012.

An Indian delegation participated in the World Conservation Congresses held at Jeju, Korea from 6-19 September, 2012.

World Heritage Convention

India is a member of World Heritage Convention (WHC) responsible for listing of World Heritage Sites, which include both Cultural and natural sites. The World Heritage Convention is a Convention under the aegis of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Wild Life wing of the Ministry of Environment and Forests is associated with the conservation of the Natural World Heritage sites. Currently, six natural World Heritage Sites have been recognized by UNESCO in India, viz., Nanda Devi National Park, Kaziranga National Park, Manas National Park, Keoladeo National Park, Sundarbans National Park and serial cluster of 39 sites from Western Ghats spread over 4 States. Apart from these, the Valley of Flowers National Park has also been included in the list of World Heritage Sites as an extension of Nanda Devi National Park. Seven new natural heritage sites, viz., Bhitarkanika Conservation area, Desert National Park, Great Himalayan National Park, Kangchendzonga National Park, Namdhapha National Park, Neora Valley National Park, and Wild Ass Sanctuary, Little Rann of Kutch have been included in the tentative list of World Heritage Site nominations from India. The information dossier for Great Himalayan National Park is under active consideration of WHC, which is likely to be evaluated by their technical advisors for consideration in the 37th Session of WHC at Phnom Penh, Cambodia in 2013. It is also proposed to seek accreditation of the Wild Life Institute of India as a Category II Centre on conservation and management of Natural Heritage Sites under the auspices of UNESCO.

Indian delegation including representatives of MoEF participated in the 35th and 36th Sessions of the World Heritage

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Committee meetings held at Paris, France and St Petersburg, Russia respectively. In the 35th session, Manas National Park was removed from the 'List of Heritage Sites in Danger' owing to the good management and conservation initiatives practised by both the Government of India as well as the State Government.

The serial nomination of 39 natural sites of Western Ghats was inscribed in the 36th Session. This is the first nomination of a series of natural sites in recognition of the biodiversity values of a landscape.

Considering the importance of World Natural Sites in India, an externally aided project has been undertaken titled "World Heritage Bio-diversity Programme for India: Building Partnerships to Support UNESCO's World Heritage Programme'. This project is an outcome of a planning grant received from the UNESCO and United Nation Foundation (UNF) and was developed under the guidance of a Project Steering Committee chaired by the Addl. Director General of Forests (WL), MoEF. The total period of the project is 10 years with two phases, viz, Phase-I of four years and Phase-II of six years. The project is being undertaken in 4 World Heritage Sites of India, viz, Kaziranga National Park, Manas National Park, Nanda Devi National Park, and Keoladeo National Park. The total financial outlay for the first phase of the project is to the tune of US \$ 1.83 million.

The main focus of the Project is on strengthening capacity for effective management; site level management policies and governance; enhance the role of local communities in conservation of biodiversity; enhancing habitat connectivity; restoration of lost attributes; research and monitoring, and identification of potential World Heritage Bio-diversity sites.

Convention on the Conservation of Migratory Species of Wild Animals (CMS)

The Convention on Conservation of Migratory Species (CMS) or Bonn Convention aims to conserve migratory species throughout their range. The Convention came into force in 1979. India is a signatory to the convention since 1983.

During COP 10, India has also been nominated as a member of the Standing Committee of the Convention with the support from various countries in the Asia. During the COP, the Ministry of Environment and Forests, WWF-India, Wetlands International and BNHS (Bombay Natural History Society) jointly organized a side event on Black-necked Crane urging the range States for regional cooperation for conservation of this unique species found in the Himalayan high altitude wetlands. Conference of Parties is held generally once in three years. Thus COP 11 is expected to be held in 2014.

International Whaling Commission

The International Whaling Commission (IWC) was set up under the International Commission for the Regulation of Whaling which was signed in Washington on 2nd December 1946. The purpose of the Convention is to provide for conservation of whale stocks. The main duty of the International Whaling Commission is to keep under review and revise as necessary the measures laid down in the schedule to the Convention which governs the conduct of whaling throughout the world. These measures, among other things, provide complete protection of certain species, designate specified areas as whale sanctuaries, limit the number of whales which may be taken, prescribe open and closed seasons and designate areas for whaling; prohibit the

capture of suckling calves and female whales accompanied by calves.

India has been a member of the International Whaling Commission since 1981 and has played a pro-active and prominent role in bringing about a moratorium on commercial whaling and supporting the Commission in its efforts towards whale conservation. All the Cetacean species (whales, dolphins, etc.) have been included in Schedule I of the Wild Life (Protection) Act, 1972 thereby giving them the highest degree of protection. Apart from this, India has always been supporting the conservation of whales through the establishment of the South Pacific Sanctuary.

The 64th Annual Meeting of the International Whaling Commission was held at Panama City, Panama from 2-6 July 2012. Indian delegation attended the meeting. India's proactive role in its efforts to conserve the whale population worldwide was appreciated during meeting.

CS- Wildlife Institute of India

Wildlife Institute of India (WII) was established in 1986 as an autonomous institute of the Ministry of Environment & Forests, Government of India. 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 products in wildlife science and mainstream it in capacity building programmes for various target groups and provide advisory support to Central and State Government. Details about Wildlife Research and Wildlife Education may kindly see in Chapter-7 & 8 respectively.

Convention on Migratory Species

Wildlife Institute of India provided required technical inputs in the 17th meeting of the Scientific Council of Convention on Migratory Species, which took place prior

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Fig-22. Lineated Barbet (*Megalaima lineata*) – listed in IUCN Red List of Threatened Species

to CoP, in November 17-18, 2011, in Bergen, Norway. Wildlife Institute of India has been assisting the Ministry of Environment and Forests, Government of India in implementing the UNEP/CMS Dugong MoU in India. As part of Dugong MoU, Wildlife Institute of India organised the First South Asia Sub-Regional Workshop and now conducting 'All India Dugong Survey' to finalize the 'National Action Plan of Dugong Conservation in India'.

Wildlife Crime Control Bureau (WCCB)

Introduction

The Wildlife Crime Control Bureau (WCCB) was constituted as a statutory body under the Wildlife (Protection) Act, 1972, by the Government of India on 6th June, 2007, to combat wildlife crime in the country. The Bureau has been envisaged as a multi-disciplinary body with officials from Police, Forest Deptts and Customs. It became operational in 2008. The Bureau has its headquarters at Delhi, five regional offices at Delhi, Kolkata, Mumbai, Chennai and Jabalpur and three sub-regional offices at Guwahati, Amritsar and Cochin. Wildlife Crime Control Bureau (WCCB), has been tasked with the following functions under Section 38 (Z), of the Wild Life Protection Act, 1972:

- Collect and collate intelligence related to organized wildlife crime activities and to disseminate the same to State and other enforcement agencies for immediate action so as to apprehend the criminals and to establish a centralized wildlife crime data bank;
- Co-ordination of actions by various officers, State Governments and other authorities in connection with the enforcement of the provisions of this Act, either directly

or through regional and border units set up by the Bureau;

- Implementation of obligations under the various international Conventions and protocols that are in force at present or which may be ratified or acceded to by India in future;
- Assistance to concerned authorities in foreign countries and concerned international organizations to facilitate co-ordination and universal action for wildlife crime control;
- Develop infrastructure and capacity building for scientific and professional investigation into wildlife crimes and assist State Governments to ensure success in prosecutions related to wildlife crimes;
- Advice the Government of India on issues relating to wildlife crimes having national and international ramifications, and suggest changes required in relevant policy and laws from time to time.

The officers of the Bureau exercise such powers as may be delegated to it under sub-section (1) of section 5; sub-sections (1) and (8) of section 50 and section 55 of the Act.

Besides, the Bureau also assists the Customs in enforcement of the Convention on International Trade in Endangered Species (CITES), by way of identification and opinion on wildlife & wildlife parts/ products; and issuance of EXIM certificates under CITES.

Performance/Achievements/Progress made during 2012-13

The progress of achievement during 2012-13 (till 31.12.2012) against the key measurable parameters identified by Prime Minister's Office is given in Table-20.

Table-20. Quarterly Progress Report for the Wildlife Crime Control Bureau for the Quarter ending 31.12.2012.

S. No.	Item	Achievement upto the quarter	Achievement During the Quarter							Progressive Total during the year 2012-13
			NR	ER	WR	SR	CR	BHQ	Total	
I	No. of Pre/Post Shipment inspections carried out									
	a) at the CFS and Docks	2485	0	325	377	368				3555
	b) At the airports/air cargo complexes	8582		546		185				13474
	c) At the FPO's	36	0	47		27			67	103
	d) sealed samples	2801		0	0					4181
	e) Land Customs Stations	3		12	0				12	15
		13907		923		580				21328
II	No. of Detections of Violations at the exit points both incoming and outgoing									
	CITES	37	12	1	3	8			24	61
	Wildlife (Protection) Act, 1972	45	2	8	1	10			21	66
	Exim Policy	38	1	0	3	2			6	44
		120	15	9	7	20			51	171
III	No. of Joint Anti-Crime Operations undertaken Agency wise:									
A	State Forest/Wildlife Departments (specify Division / other unit)	13	0	0	1	4			5	18
B	State Police	8	0	0	0	0			0	8
C	Customs (specify unit)	40	15	0	1	4				60
D	DRI (specify unit)	0	0	1	0	0			1	1
E	Others :	0	0	1	0	0			1	1
		61	15	2	2	8				88
IV	No. of Training Programmes conducted agency wise									
A	CISF	7	1	1	1	0			3	10

S. No.	Item	Achievement upto the quarter	Achievement During the Quarter							Progressive Total during the year 2012-13
			NR	ER	WR	SR	CR	BHQ	Total	
B	Customs/Central Excise	6	1	1	1	2			5	11
C	State Forest/Wildlife	4	0	0	3	5			8	12
D	State Police	0	0	0	0	0			0	0
E	Others :	1	0	2	0	0	1		3	4
		18	2	4	5	7	1			37
V	No. Of Coordination meetings conducted/ attended								0	
A	State Forest/Wildlife	7	1	2	0	3	0		6	13
B	State Police	4	0	1	0	0	0		1	5
C	CPF's	5	0	0	0	0	0		0	5
D	Customs	4	0	0	0	1	0		1	5
E	Postal Appraising	1	0	0	0	0	0		0	1
F	NCB	0	0	0	0	0	0		0	0
G	CBI	0	0	0	0	0	0		0	0
H	DRI	2	0	0	0	0	0		0	2
I	Others :	6	0			2			0	8
		29	1	3	0	6	0			39
VI	No. of Sensitization Programmes conducted/ attended in respect of PRI's	2	0	3		1	1			20
VII (a)	No. Of Cases filed in the Courts	0	0	0	0	0			0	0
(b)	No. Of Cases under trial	21	2	1						24
(c)	No. Of Convictions sentenced by Courts	0	1	0	0	0			1	1

Budget allocation and progress of expenditure during 2012-13

Against the allocation of ₹413.65 lakh for the year 2012-13, expenditure incurred till 31.01.2013 was ₹266.57 lakh.

CSS- Project Elephant Introduction

Project Elephant (PE) was launched by the Government of India in the year 1991-92 as a

Centrally Sponsored Scheme with 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. The Project is being mainly implemented in 16 States / UTs, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Meghalaya, Nagaland, Odisha, Tamil Nadu, Tripura, Uttrakhand, Uttar Pradesh and West Bengal.

Important Initiatives taken during the year

- EFC report submitted to Planning Commission.
- Organisation of International Elephant Congress and Ministerial Meet
- Management of Captive Elephants
- Elephant Rescue Centre/Rehabilitation Centre
- Launch of "Haathi Mere Saathi" campaign
- Monitoring and Evaluation

EFC for grants in Aid to State

- Protection of Elephants
 - Establishment of Anti-poaching camps, deployment of squads etc.
 - Procurement of rifle/guns/ammunitions
 - Strengthening of infrastructure like wireless communication, construction of culverts bridges etc.
 - Rewards to informers and intelligence gathering.

- Construction/ maintenance around Elephant Reserve (ER) to prevent diseases
- Conservation and development of habitats and corridors
 - Habitat improvement of habitats/corridors by enrichment plantation.
 - Removal of invasive species.
 - Creation of water bodies.
 - Fire protection measures.
 - Eco-restoration of corridors including acquisition and relocation.
 - Soil and water conservation measures
- Eliciting public cooperation and mitigation of human elephant conflict
 - Ex-gratia payment for loss/injury of life, property, crop etc.
 - Eco-development and community oriented activities.
 - Setting up of anti depredation squads with crackers, k oils etc to scare away elephants.
 - Creation of elephant proof trenches, solar power fencing.
 - Procurement of tranquilizing guns, medicines and other infrastructure for capture and translocation of problem elephants including capture and translocation of problem population of elephants; translocation and/or elimination of rogue elephants.
- Improvement of support services including monitoring, research and training
 - Monitoring of elephant population
 - Implementation of Monitoring of Illegal Killing of Elephants (MIKE) programme including purchase of equipments like computers etc.

2



Fig-23. Interaction of male tuskers at Kaziranga National Park

- Training of officers, field staff in elephant management technique.
 - Training of Vets and Mahouts.
 - To improve and create infra-structure for the welfare of elephants in domestic use, including their veterinary care, rehabilitation centre etc.
 - Preparation of Management Plans including studies.
 - Evaluation and Monitoring of Scheme.
 - Workshop/Meeting of stakeholders/ Steering Committee.
 - Awareness programmes for elephant conservation including educational/promotional visits using IEC mechanism
- (Audio-Visual, Documentary, Nominating grand Ambassador).
- Coordination with foreign Governments and International Agencies, including foreign travel for programmes related to the conservation and management of elephants in the wild as well as in captivity.

International Elephant Congress and Ministerial Meet (E 50:50)

The Ministry of Environment and Forests, Government of India will host the First International Elephant Congress and Ministerial Meet, E 50:50 from 14th to 19th November, 2013 in New Delhi. It will bring together scholars, conservation practitioners and policy makers to discuss issues on elephant conservation

policy. The Congress will include conclaves on science, culture and management culminating in a ministerial summit to adopt a vision charter with common minimum global vision on conservation, management and welfare of elephants across all range countries.

The need

Elephants, the largest terrestrial mammals that share our planet with us are a global flagship for biodiversity conservation. Three species of elephants are found distributed across 50 countries today. Regardless of geopolitical boundaries, elephants across the world face common threats of poaching, habitat loss and conflicts with people.

In 2010, the Government of India had constituted the Elephant Task Force (ETF) to formulate a strategy for the long-term conservation of elephants in India.

Recognising that the three species of elephants are interlinked by common threats, the ETF recommended, among others, that the Indian government take global lead to bring about a unified approach to elephant conservation and welfare. Thus the International Elephant Congress was envisioned.

As a prelude to the Congress, the Government of India organised the E-8 Ministerial Meet in May 2011 that brought together a ministerial delegation of eight elephant range countries, viz. Botswana, Congo Brazzaville, India, Indonesia, Kenya, Sri Lanka, Tanzania and Thailand at New Delhi, India. The meet deliberated on various issues affecting elephant conservation in the world that led to the "New Delhi E-8 Recommendation on Global Elephant Conservation" and recommended the agenda for the 'International Elephant Congress and Ministerial Meet (E-50:50)'.

Themes for technical sessions during E 50:50:

- Elephant Science
- Elephant Management and Conservation
- Elephant: Culture and Ethics

Management of Captive Elephant

India has nearly 3600 captive elephants. The Task Force recognizing the role of captive elephants in our culture and traditions, has suggested following measures:-

- Strict enforcement of the existing legal provisions.
- One time amnesty to all elephant owners to declare the same for grant of ownership certificate to be called guardianship certificate in future.
- Setting up of Captive Elephant Welfare Committees (CEWCs) at state level for regular monitoring of the conditions of captive elephants.
- Training and certification of Mahouts.
- Creation of life time care centers for elephants.
- Creation of wildlife veterinary wing within State Forest Department.

Elephant Rescue Centre/ Rehabilitation Centre

Management of Captive Elephants is one of the main target in PE Division during 12th Five Year Plan. Even major initiatives are to be taken for Establishment and maintenance/ strengthening of the existing Elephant Rehabilitation Centers. At present, Odisha, Haryana, Kerala and Tamil Nadu are having Elephant Rehabilitation Centers which are being funded by MoEF under PE Scheme.

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Estimation of Wild Elephants

All India estimation of wild elephant population is done every 5 years. The trend of last four estimations clearly indicates increase in population of wild elephants in the country. Next All India Estimation was due in 2012. The

estimated population of the elephants is being compiled by the different states. Since this exercise is done after the interval of 5 years, the figure of estimated population of elephants is due for release in 2013. The results of last four estimations are given in Table-21.

Table-21. Estimated population of wild elephants

Region	State	Elephant Population			
		1993	1997	2002	2007
North-East	Arunachal	2102	1800	1607	1690
	Assam	5524	5312	5246	5281
	Meghalaya	2872	1840	1868	1811
	Nagaland	178	158	145	152
	Mizoram	15	22	33	12
	Manipur	50	30	12	Nil
	Tripura	100	70	40	59
	West Bengal (North)	186	250	292	300-350
Total for North-East		11027	9482	9243	9305-9355
East	West Bengal (South)	14	26	36	25
	Jharkhand	550	618	772	624
	Odisha	1750	1800	1841	1862
	Chattisgarh	-	-	-	122
Total for East		2314	2444	2649	2633
North	Uttarakhand (*part of earstwhile UP)	828*	1130*	1582	1346
	Uttar Pradesh	47	70	85	380
Total for North		875	1200	1667	1726
South	Tamil nadu	2307	2971	3052	3867
	Karnataka	5500	6088	5838	4035
	Kerala	3500	3600	3850	6068
	Andhra Pradesh	46	57	74	28
	Maharashtra	-	-	-	7
Total for South		11353	12716	12814	14005
Islands	Andaman & Nicobar	35	35	40	NA
Grand Total		25604	25877	26413	27669-27719

Elephant Reserves

With the notification of Badalkhol-Tamorpingla in Chhattisgarh in the year 2011, the total number of Elephant Reserves (ERs) in the country has become 28 where as permission for two more Elephant Reserves such as Lemru in Chattisgarh and Khasi Elephant Reserve in Meghalaya have been accorded by the Ministry and not been notified by the States so far. The area under these would be extending over about 61830 sq km. The list of ERs with date of Notification and area is as below:

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

An amount of ₹ 22.58 crores was allocated and the expenditure incurred upto 20th January, 2013 is ₹ 16.52 lakh.

Central Zoo Authority

The Central Zoo Authority (CZA) 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), an 'Expert Group on Zoo Designing' and 'Expert Group on Conservation Breeding' have been constituted 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:

- To specify the minimum standards for housing, upkeep and veterinary care of the animals kept in zoos;
- To evaluate and assess the functioning of the zoos with respect to the prescribed standards or norms;
- To recognize or derecognize zoos;
- To identify endangered species of wild animals for purposes of captive breeding and assigning responsibility in this regard to a zoo;
- To coordinate the acquisition, exchange and loaning of animals for breeding purpose;
- To ensure maintenance of studbooks of endangered species of wild animals bred in captivity;
- To identify priorities and themes with regard to display of captive animals in zoos;
- To coordinate training of zoo personnel in India and outside India;
- To coordinate research in captive breeding and educational programmes for the purposes of zoos;
- To provide technical and other assistance to zoos for their proper management and development on scientific lines;
- To perform such other functions as may be necessary to carry out the purposes of this Act with regard to zoos.

Recognition of Zoo Rules, 2009

The Central Zoo Authority has revised 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,

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Table-22. List of Elephant Reserves in India

Sl. No	Elephant Range	Elephant Reserve with date of notification	State	Total Area (Sq. Km)
I	Eastern India (South West Bengal-Jharkhand-Odisha)	1. Mayurjharna ER(24.10.02)	W. Bengal	414
		2. Singhbhum ER (26.9.01)	Jharkhand	4530
		3. Mayurbhanj ER (29.9.01)	Odisha	3214
		4. Mahanadi ER (20.7.02)	Odisha	1038
		5. Sambalpur ER (27.3.02)	Odisha	427
		6. Badalkhol-Tamorpingla (15.9.2011)	Chhattisgarh	1048.30
	Total			10671.30
II	North Brahmaputra (Arunachal – Assam)	7. Kameng ER (19.6.02)	Arunachal	1892
		8. Sonitpur ER (6.3.03)	Assam	1420
	Total			3312
III	South Brahmaputra(Assam-Arunachal)	9. Dihing-Patkai ER (17.4.03)	Assam	937
		10. South Arunachal ER (29-2-08)	Arunachal	1957.50
	Total			2894.50
IV	Kaziranga(Assam- Nagaland)	11. Kaziranga – Karbi Anglong ER (17.4.03)	Assam	3270
		12. Dhansiri-Lungding ER (19.4.03)	Assam	2740
		13. Intanki ER (28.2.05)	Nagaland	202
	Total			6212
V	Eastern Dooars(Assam- W. Bengal)	14. Chirang-Ripu ER (7.3.03)	Assam	2600
		15. Eastern Dooars ER (28.8.02)	W. Bengal	978
	Total			3578
VI	E. Himalayas (Meghalaya)	16. Garo Hills ER (31.10.01)	Meghalaya	3,500
	Total			3500
VII	Nilgiri –Eastern Ghat(Karnataka- Kerala-Tamilnadu-Andhra)	17. Mysore ER (25.11.02)	Karnataka,	6724
		18. Wayanad ER (2.4.02)	Kerala	1200
		19. Nilgiri ER (19.9.03)	Tamilnadu	4663
		20. Rayala ER (9.12.03)	Andhra	766
	Total			13353
VIII	South Nilgiri (Kerala- Tamilnadu)	21. Nilambur ER (2.4.02)	Kerala	1419
		22. Coimbatore ER (19.9.03)	Tamilnadu	566
	Total			1985
IX	Western Ghat(Tamilnadu- Kerala)	23. Anamalai ER (19.9.03)	Tamilnadu	1457
		24. Anamudi ER (2.4.02)	Kerala	3728
	Total			5185
X	Periyar(Kerala- Tamilnadu)	25. Periyar (2.4.02)	Kerala	3742
		26. Srivilliputtur ER(19.9.03)	Tamilnadu	1249
	Total			4991
XI	Northern India (Uttarakhand-U.P.)	27. Shivalik ER (28.10.02)	Uttarakhand	5405
		28. Uttar Pradesh ER (9.9.09)	U.P.	744
				6149
	Total			61830.80

Table-23. Evaluation of Zoos as on 18th January, 2013.

S. No.	Name of the State	Name of the Zoo	Category of the Zoo	Date of evaluation
1.	Andhra Pradesh	Kinnerasani Deer Park, Kinnerasani	Mini Zoo	24-25.04.2012
2.	Kerala	Mini Zoo, Kodanad	Mini Zoo	14-15.05.2012
3.	Karnataka	Wildlife Rescue and Rehabilitation Centre, Bengaluru	Rescue Centre	25.04.2012
4.	Karnataka	Kaiwara Tapovana Zoo, Kolar	Mini Zoo	23.05.2012
5.	Kerala	Hill Palace Zoo, Ernakulam	Mini Zoo	14.05.2012
6.	Karnataka	Bellary Zoo, Bellary	Mini Zoo	24.05.2012
7.	Karnataka	People for Animals Rescue Centre, Bengaluru	Rescue Centre	25.04.2012
8.	Andhra Pradesh	Tirumala Hills Deer Park, Tirumala	Mini Zoo	18.08.2012
9.	Jharkhand	Tata Steel Zoological Park, Jamshedpur	Small Zoo	13.09.2012
10.	Jharkhand	Jawaharlal Nehru Biological Park, Bokaro	Small Zoo	02.01.2012
11.	Karnataka	Tungabhadra Mini Zoo, Tungabhadra, Bellary	Mini Zoo	16.08.2012
12.	Karnataka	Indira Priyadarshini Prani Sangrahalaya, Anagodu, Davangere	Mini Zoo	26.04.2012
13.	Karnataka	A. M. Gudi Mini Zoo, Balvana	Mini Zoo	26.04.2012
14.	Maharashtra	Maharaja Shahaji Chhatrapati Zoo, Kolhapur	Mini Zoo	04.09.2012
15.	Uttar Pradesh	Sarnath Deer Park, Varanasi	Mini Zoo	10.10.2012
16.	Uttar Pradesh	Kanpur Zoological Park, Kanpur	Medium Zoo	16.06.2012
17.	West Bengal	Nature Park, Taratola, Kolkata	Mini Zoo	25.06.2012
18.	West Bengal	Garchumukh Deer Park, Garchumukh	Mini Zoo	27.06.2012
19.	West Bengal	Surulia Mini Zoo, Purulia	Mini Zoo	05.11.2012
20.	West Bengal	Ramnabagan Mini Zoo, Burdwan	Mini Zoo	09.11.2012
21.	West Bengal	Pugmarks-PFA Santiniketan Rescue Centre, Distt. Birbhum	Rescue Centre	07.11.2012
22.	West Bengal	Zoological Garden, Alipore	Medium Zoo	27.06.2012
23.	Dadra & Nagar Haveli	Lion Safari, Vasona	Mini Zoo	29.12.2012
24.	Karnataka	Mini Zoo at Gendekatte Hassan	Mini Zoo	19.12.2012
25.	Sikkim	Himalayan Zoological Park, Bulbuley	Mini Zoo	09.12.2012
26.	West Bengal	Kunjnagar Eco Park, Kunjanagar	Mini Zoo	12.10.2012
27.	West Bengal	Kumari Kangsabati Deer Park, Bankura	Mini Zoo	06.11.2012
28.	West Bengal	Adina Deer Park, Malda	Mini Zoo	26.10.2012
29.	West Bengal	Jhargram Deer Park, Jhargram	Small	08.11.2012
30.	West Bengal	Rasikbeel Mini Zoo, Rasikbeel	Mini Zoo	11.10.2012

2009 to revise the criteria of classification of zoos and constitution of Zoo Foundation by each zoo to have provision for ploughing back the revenue generated by zoo for development activities.

Evaluation of zoos

The Central Zoo Authority evaluated 2 Medium, 3 Small and 22 Mini Zoos and 3 Rescue Centres. The details about are given in Table-23.

Recognition/ de-recognition of zoos

The Central Zoo Authority has granted extension of recognition to 2 Medium, 3 small, 22 mini zoos and 3 rescue centres as on 18th January, 2013 with certain conditions and stipulations for improvement. There are 196 recognized zoos (including 23 nos. of circuses) in the country. One circus and one Mini Zoo has been de-recognized after following due procedure as per Wild Life (Protection) Act 1972.

Exchange/Transfer of animals by zoos

Thirty three exchange proposals of animals between Indian zoos and 12 exchange proposals between Indian and foreign zoos have been approved by the authority during the year 2012-13 till January 2013.

Theme/ Planning in zoos

The Central Zoo Authority is assisting recognized zoos in finalization of Master plans for detailed long term future development. So far 162 detailed Master Plans has been received as on 18th January 2013. During the current financial year; CZA has approved Master (layout) Plan of 23 zoos and 5 Master Plan.

Human Resource Development

During the current financial year, the CZA had organized following training programme for capacity building in the zoos:

- Specialized theme based training programmes for zoo keepers on regional basis “Management of wild animals in captivity with special reference to enrichment of animal enclosures” in collaboration with Assam State Zoo, Guwahati; Kamla Nehru Zoological Park, Ahmedabad; Sri Chamarajendra Zoological Gardens, Mysore; Kanpur Zoological Park, Kanpur, G. B. Pant High Altitude Zoo, Nainital and Nandankanan Zoological Park, Bhubaneswar.
- The Central Zoo Authority in collaboration with Veterinary College, Khanpara Guwahati and Assam State Zoo, Guwahati organized hands on training programme for the Zoo Veterinarian on “Restraint of zoo animals and their transport” from 24th to 28th September 2012 at Assam State Zoo, Guwahati.
- The Central Zoo Authority in collaboration with the Durrell Wildlife Conservation Trust, UK and Padmaja Naidu Himalayan Zoological Park, Darjeeling organized a Training programme on “Endangered Species Recovery Course” for the senior zoo personnel at Padmaja Naidu Himalayan Zoological Park, Darjeeling from 17th to 21st November 2012.
- The Central Zoo Authority sponsored Dr Sam Varghese, Forest Ranger, Biological Park, Chidiyatapu, A & N Island deputed & sponsored by CZA for attending the Endangered Species Recovery Course organized by the Durrell Wildlife Conservation Trust, Jersey UK 9th July – 20th July, 2012.
- Shri B.S. Bonal, Member Secretary, Central Zoo Authority attended 67th meeting of the WAZA & CBSG held at Malbourne, Australia from 7th – 11th October 2012.

- The Central Zoo Authority has deputed and sponsored the Director, National Zoological Park (NZP) Delhi for attending 67th International WAZA & CBSG Meeting at Melbourne, Australia.
- Zoo officials from SAARC countries were invited to attend in the Workshop held at Veterinary College, Khanpara, Guwahati and Workshop on "Recovery of endangered species" Organized with Durrell Wildlife Conservation Trust, U. K. Officials from Sri Lanka, Nepal and Bhutan attended the same.

Finance

During the financial year 2012-13, total ₹ 1850.00 lakhs has been allotted to CZA as grant-in-aid from Ministry of Environment and Forests. Out of this ₹ 1031.46 lakhs has so far been released to various Zoos and other Organizations from the sanctioned grant-in-aid.

Conservation Breeding Programme

For coordinated planned Conservation Breeding Programme 26 numbers of species has been prioritized out of 73 identified endangered wild animal species in Indian zoos. During the financial year 2012-13, the Central Zoo Authority has released ₹ 42.10 lakhs to Old Zoo, Kohima, Nagaland for Conservation Breeding Programme of Blyth's tragopan; ₹ 5.91 lakhs to Padmaja Naidu Himalayan Zoological Park for conservation breeding programme of Red Panda, Darjeeling; ₹ 57.80 lakhs Vulture Conservation Center, Pinjore, Assam State Zoo for Golden langur.

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

Research and Training

The Central Zoo Authority has awarded grant for research projects, ₹ 11.49 lakhs to LaCONES, Hyderabad for project on Biotechnological interventions for conservation; 9.00 lakhs to Wildlife Institute of India, Dehradun for studies on housing and enclosure enrichment; 2.25 lakhs to Nandankanan Zoological Park for research project on behavioural study of Indian Pangolin.

The Central Zoo Authority has also awarded grant for training and workshops at different places in India. The grant of ₹ 14.00 lakhs to Veterinary College, Guwahati for National Workshop at Guwahati; ₹ 4.50 lakhs to Kanpur Zoological Park, Kanpur for Zoo keepers training at Kanpur Zoo, Kanpur; ₹ 4.50 lakhs to Assam State Zoo, Guwahati for Zoo Keepers training at Guwahati; ₹ 26.90 lakhs to Darjeeling Zoo, for 5 day training with DWLCT, UK; ₹ 6.97 lakhs to LaCONS, Centre for Cellular and Molecular Biology (CCMB), Hyderabad for one day conference at Hyderabad; ₹ 5.65 lakhs to Director, WTI, Noida for International bear conference organized in New Delhi in collaboration with MoEF, & WII, ₹ 28.99 lakhs to Director, WII for Workshop on Vulture Conservation Asia in collaboration with IUCN held at New Delhi from 3rd – 5th May 2012.

Improvement of zoos

The Central Zoo Authority convened meeting of the Technical Committee during the current financial year on 5th July (62nd Meeting) and 5th December (63rd 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 to discuss the

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new guidelines to be adopted by the zoos while submitting the proposal related to the conservation breeding. During the meetings 26 out of 73 identified endangered species were prioritized along with scrutinizing the various proposal on Conservation Breeding.

The Expert Group on Zoo Designing convened 10 meetings as on 3rd April 2012 (28th Meeting), 11th April 2012 (29th Meeting), 9th May 2012 (30th Meeting), 22nd June 2012 (31st Meeting), 17th July 2012 (32nd Meeting), 8th August 2012 (33rd Meeting), 20th September 2012 (34th Meeting), 26th November 2012 (35th Meeting), 6th December 2012 (36th Meeting), 26th December 2012 (37th Meeting), 18th January 2013 (38th 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 etc.

CZA also had Meeting on 8th January for various issues of CZA.

Rescue Centre

The Central Zoo Authority has provided an amount of ₹ 335.69 lakhs for maintenance including feed and medicines etc. to rescue centres created at Chennai, Mysore, Visakhapatnam, Tirupati, Bhopal, and Jaipur for the lions, tigers, leopards, bears and monkeys rescued from the circuses and housed off-exhibit at these rescue centres.

International Cooperation

- CZA has been nominated as member of council of ISIS/ZIMS
- CZA has been nominated as a Protector member of CBSG
- India will be hosting 2014 World Zoo Conference (WAZA) in New Delhi – 9th – 13th November 2014, preceded by the CBSG annual meeting from 6th – 9th November 2014.

- Organized training/ capacity building programme for the zoo personnel of SAARC countries as add on to ongoing training programme.
- MoU with Leipzig Zoo, Leipzig, Germany on various aspect of zoo management was signed in addition to the already existing MoU with Wildlife Reserve, Singapore for Human Resource Development (Exchange training programme).
- MoU with Central Zoo, Nepal has been approved for better relations.
- MoU with University of California, Wildlife Institute of India and CZA for primates has been approved.

National Tiger Conservation Authority (NTCA)

Introduction

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”.

Milestone Achievements

- A detailed report on the country level status of tigers, co-predators and prey in India was released on 28th July, 2011. This was the second round of country level snapshot assessment which indicates 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.

At present, India has the maximum number of tigers and its source areas amongst the 13 tiger range countries in the world, owing

to its long history of conserving the species through Project Tiger (2% of country's geographical area spread out in 41 tiger reserves in 17 States).

- A report on Management Effectiveness Evaluation (MEE) of Tiger Reserves was released on 28th July, 2011, containing the second round of independent assessment based on refined criteria done in 2010-11 for 39 tiger reserves. Out of 39 tiger reserves, 15 were rated as 'very good', 12 as 'good', 8 as 'satisfactory' and 4 as 'poor'.
- The Revised Cost Estimates for Project Tiger was approved on 11.08.2011 for an upward revision of the cost estimates for the ongoing Centrally Sponsored Scheme of Project Tiger during the XIth Plan period from 650 crore to ₹1216.86 crore of central assistance to support States in village relocation from core areas of tiger reserves. Several new components were added to the Project, viz.
 - Change in the funding pattern in respect of North Eastern States (90:10)
 - Raising compensation for man-animal conflict to ₹2 lakhs
 - 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
- Launching of Phase-IV tiger reserve level, continuous monitoring of tigers using camera traps and building up data on photo captures of individual tigers.
- Launching the creation of a national repository of camera trap photo IDs of individual tigers.
- Notification of the Kawal Tiger Reserve in Andhra Pradesh
- Giving in-principal approval to five new tiger reserve, viz. Pilibhit (Uttar Pradesh), Ratapani (Madhya Pradesh), Sunabeda (Odisha), Mukundara Hills (including Darrah, Jawahar Sagar and Chambal Wildlife Sanctuaries) (Rajasthan) and Sathyamangalam (Tamil Nadu).
- In-principal approval for use of CAMPA funds towards village relocation from core areas.
- Completion of e-surveillance project in Corbett.
- Launching 'M-STripes' monitoring protocol.



Fig-24. Tiger (*Penthra tigris tigris*) - our national animal

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Table-24. Plan Expenditure under the Centrally Sponsored Scheme of Project Tiger (as on 31.01.2013)

(₹ in crore)

S. No.	Budget Head	BE	Expenditure
Project Tiger Scheme			
1.	3601 (assistance to States excluding North Eastern Region)Grants-in-Aid General	134.70	124.45
2.	3601 (assistance to States excluding North Eastern Region) Scheduled Tribe Sub Plan	10.00	9.16
3.	3601 (assistance to States excluding North Eastern Region) Scheduled Castes Sub Plan	6.00	2.83
4.	2552 (assistance to North Eastern Region)	16.00	9.87
5.	2406 (National Tiger Conservation Authority) Grants-in-Aid General	1.00	Nil
	Total	167.70	146.31

- The Special Tiger Protection Force (STPF) has been raised and deployed in three tiger reserves, viz. Bandipur (Karnataka), Tadoba-Andhari (Maharashtra) and Pench (Maharashtra) (committed to support the other tiger States as well in this regard).
- Comprehensive guidelines under section 380 1(c) of the Wildlife (Protection) Act, 1972 issued for Project Tiger and Tourism in Tiger Reserves on 15th October, 2012.
- A 'SOP' to deal with tiger deaths issued in December, 2012.
- A 'SOP' to deal with straying tigers issued in January, 2013.
- Under active management, permission accorded for translocation of two tigresses from Ranthambhore to Sariska (Rajasthan), besides one straying sub-adult male tiger from Panna to Satpura (Madhya Pradesh).
- A bilateral arrangement has been recently formalized with Bangladesh on tiger conservation. Our delegation are interacting with Nepal and China within the framework of existing bilateral arrangements. A sub-group on tiger/leopard conservation has been constituted for cooperation with the Russian Federation, which has met recently.



Fig-25. Successful breeding programmes at NZP, New Delhi

- Field level workshop for capacity building of field officers to deal with straying tigers being organized at Tadoba and Dudhwa Tiger Reserves (2013).

- NTCA teams sent for field appraisal of tiger deaths, Project Tiger implementation etc.

Table-25. Fund release to States during the current financial year 2012-13 under the CSS of Project Tiger (as on 11.02.2013)

S. No.	Name of the State	Amount (in lakh)
1	Andhra Pradesh	404.89
2	Arunachal Pradesh	420.08
3	Assam	373.89
4	Bihar	311.06
5	Chhattisgarh	425.52
6	Jharkhand	82.68
7	Karnataka	930.53
8	Kerala	514.83
9	Madhya Pradesh	5438.30
10	Maharashtra	657.43
11	Mizoram	241.31
12	Odisha	142.95
13	Rajasthan	3608.38
14	Tamil Nadu	384.53
15	Uttarakhand	89.43
16	Uttar Pradesh	248.10
17	West Bengal	404.91
	Total	14678.82

- Process underway for providing enabling provisions in the Wildlife (Protection) Act, 1972, to strengthen our implementation of the CITES and towards enhancement of penalties for contravention of provisions of the Act.
- The successful reintroduction of wild tigers in Sariska is a unique exercise and is the first of its kind in the world. A reintroduced tigress has recently littered and two cubs have also been camera trapped. The tiger reintroduction initiative at Panna (MP) has also been very successful and reintroduced tigers are breeding.

Budget allocation of the Scheme during the year and progress of expenditure. Details are given in Table-24.

Animal Welfare

The Animal Welfare Board of India (AWBI)

The Animal Welfare Board of India (AWBI) 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 Animal Welfare Organizations (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 ₹ 25 lakhs including 10% contribution to be made by the AWOs. The amount is released in two equal installments.

Scheme for Animal Birth Control and Immunization of stray dogs

Keeping in view the overpopulation of stray dogs throughout the country and also the increase of human / animal deaths due to Rabies, this scheme is 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 ₹ 370/- per dog for pre & post operative care including medicines & ARV and ₹ 75/- per dog for catching and relocation of dog (Total ₹ 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 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 ₹ 3.50 lakhs for purchase of the vehicle and ₹ 1.00 lakhs for equipment, modification and fittings thereon.

Scheme for Relief to Animals during Natural Calamities and Unforeseen Circumstances

Various natural calamities in the form of floods, cyclones, droughts and, Tsunami and earthquakes do occur in India. 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. It is proposed to extend 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.

Animal Welfare Division handles following two schemes:-

- Committee for Purpose of Control & 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 30.08.2012 as a Committee of experts from several areas, including medicine, veterinary science, pharmaceuticals, biotechnology, biostatistics, animal behaviour and ethics. Apart from this, representative of NGOs/AWOs are also associated with CPCSEA with the approval of Hon'ble Minister. A total of 23 institutions have been registered by CPCSEA, 35 Renewal has been made and 7 Animal house Facility have been approved. Conference and workshop were held in Delhi, Lucknow, Chennai, Hyderabad, Patna, Kolkata and National Symposium at Mizoram.

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 behaviour and ethics. The aim is to create an enabling environment for

Table-26. Progress/Achievement made during 2012-13

	Outlay 2012-13	Quantifiable deliverables	Achievements till 20.12.2012	BE 2013-14	Quantifiable deliverables in 2013-14
AWBI Plan	700	750 AWOs	290 AWOs	1400	1000 AWOs
Shelter House	920	46 Shelters	15 AWOs	1150	52-55 Shelters
ABC	270	110000 Operations	13960 ABCs	600	135000 ABCs
Ambulance Scheme	445	60 Ambulances	2 Ambulances	400	90-95 Ambulances
Natural Calamity	10	Cannot be fixed	1 AWO	30	Cannot be fixed
CPCSEA	50	Cannot be fixed	23 Registrations 35 Renewals 7 Animal House	55	Cannot be fixed
NIAW	125	20 Training	8 Training	275	26 Trainings
Grand Total					

fulfillment of the statutory requirements as laid down in the Prevention of Cruelty to Animals Act, 1960.

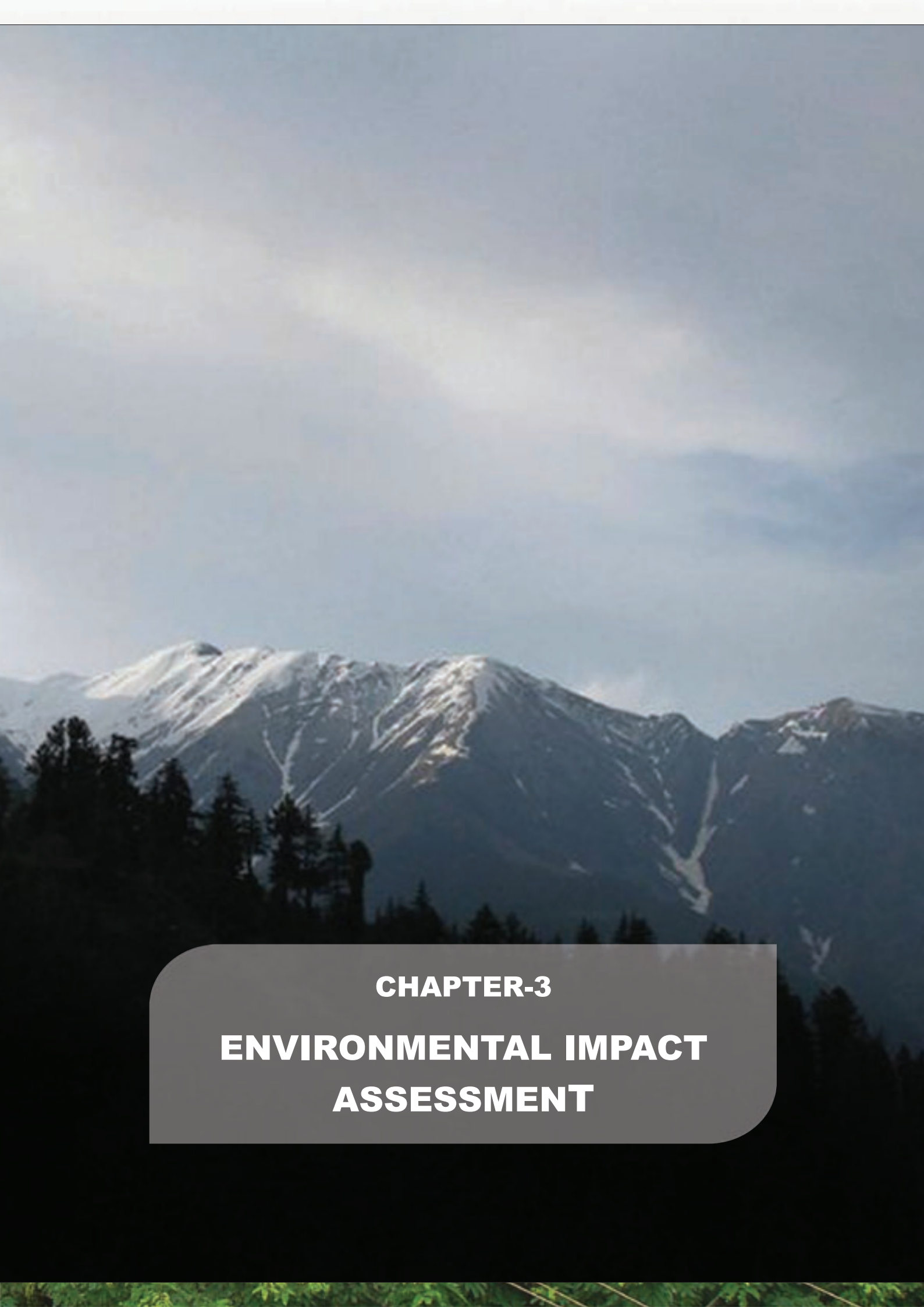
NIAW has been conceptualized as an apex body in the field of animal welfare and its broad mandate covers the need to improve animal welfare through education, research and public outreach. The Institute has been operational since January, 2006 and the process of appointment of faculty is underway. The Institute is expected to evolve as a premier body with international stature, with participation of faculty / trainees from other countries.

From the total target of 26 training programme, 7 training programme have been completed as on date. There is a proposal for Internship Training Programme (Pant Nagar, Mathura, Bikaner, etc) In-Service Training Programme for Zoo personnels, Animal Handlers and Capacity Building are also proposed to be undertaken.

The details of budget allocation of 2012-13 and progress of expenditure is summarized in Table-27.

Table-27. Budget allocation and progress of expenditure during 2012-13; XII plan Outlay

S. No.	Scheme	12th Plan (2012-17) Approved Outlay	BE 2012-13	Amount Released	Utilization (in %)
1.	AWBI Plan	7315	700	700	
2.	Shelter House	6021	920	920	
3.	ABC	3000	270	270	
4.	Ambulance Scheme	1973	445	445	
5.	Natural Calamity	150	10	10	
6.	CPCSEA	305	50	25	
7.	NIAW	1236	125	35.81	Shifted from Grant-in-Aid to direct payment
	Grand Total	20000	2520	2405.81	95.5%



CHAPTER-3
ENVIRONMENTAL IMPACT
ASSESSMENT

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 Four Hundred eleven projects. (between April, 2012 to January, 2013). The sector wise list of environmental clearances issued to the projects by the Ministry is given in the Table-28.

Table-28. Environmental Clearances accorded during April, 2012 – January, 2013

Sl. No.	Category of Projects	Total
1	Industry	202
2	Thermal	37
3	River Valley & Hydro-Electric	05
4	Mining (Coal)	14
5	Mining (Non-Coal)	46
6	CRZ, Infrastructure, Construction, Industrial Estates	102
7	Nuclear, Defence & Strategic Projects	05
	Total	411

Constitution of State Environment Impact Assessment Authorities (SEIAA)

The Ministry has so far constituted twenty seven State/UT level Environmental Impact

Assessment Authorities [SEIAA/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.

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, 2012, eight hundred fifty 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 Coastal Regulation Zone (CRZ) Notifications and to suggest effective monitoring mechanism. The committee has 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.

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 30th June, 2011. No EIA/Environment Management Plan (EMP) Reports prepared by such consultants who are not registered with NABET/QCI are being considered by the Ministry after 30th June, 2011.

EIA Manuals

Expert Appraisal Committees (EAC) 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 ₹ 1153 crores. Under this project, various components including mangrove afforestation, coral restoration, shoreline protection, hazard

mitigation, alternative livelihood are being implemented.

To implement the above project, Society of Integrated Coastal Management (SICOM) has been established as a registered body. This Society will be implementing the CZM projects having four major components namely, (i) National Coastal Management Programme, and three ICZM projects in three States namely, Gujarat, Odisha 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 (₹298 crores), Paradip-Dhamra and Gopalpur-Chilka stretch in Odisha (₹202crores) and Digha-Shankarpur and Sagar islands in West Bengal (₹300 crores). The State components address the issues relating to coastal management including improving livelihood of the local communities, disaster mitigation and promoting sustainable alternative livelihoods.

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.

The Interim Report based on post monsoon data had been submitted by ISM, Dhanbad. Findings reported in the interim report was presented to the Ministry on July 10, 2012. The final report of the study is expected by August, 2013.

Major Policy decisions taken during the year

- **Extension of Moratorium up to 31st March, 2012**

Ministry had imposed a moratorium till 31st 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. It has been decided that the moratorium would continue in the remaining 18 industrial clusters till the matter is reviewed in the light of update to be provided by Central

Pollution Control Board regarding the implementation of action plans as per O.M dated 31st March, 2012.

Categorization of projects / activities into category 'B1' & 'B2' under EIA Notification, 2006

An Expert Committee has been constituted on 30.1.13 to categorize Category 'B' projects / activities into category 'B1' & 'B2' under EIA Notification, 2006 and review classification of projects / activities into 'A' & 'B' and General Conditions as contained in this Notification

– **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 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 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 earlier that there is a danger of regularization of violations through the process of reclassification and had, therefore, decided to freeze the CZMPs approved in 1996 and to only consider cases where there is error apparent on record. Accordingly, the OMs were brought out in July and August, 2011. Further considering the requirement of preparation of new Coastal Zone Management Plans (CZMP) and the time limit prescribed under the CRZ Notification, decided that considering the individual proposals on ‘error evident on record’ at this stage was not advisable.

– **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.

Review the provisions of EIA Notification, 2006 relating to building, roads and SEZ projects

OM dated 07.02.2012 has been issued by regarding guidelines for high-rise buildings. Further, vide OM dated 11.12.2012, a committee has been constituted under Dr. K. Kasturirangan, Member, Planning Commission, to review the provisions of

EIA Notification, 2006 relating to building, roads and Special Economic Zone (SEZ) projects and guidelines for high-rise buildings.

Simplification of Clearance Procedure for National Manufacturing and Investment Zone (NIMZ)/SEZs unit

OM dated 01.11.2012 has been issued relating to simplification of clearance procedure for SEZs in line with the framework prescribed for NIMZs under the National Manufacturing Policy. The individual units within the NIMZs would be exempted from public hearing once a public hearing has been conducted for the entire NIMZ, provided these NIMZs are notified as Industrial estate by the State Governments Concerned.

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 31st March, 2013.

– 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 Million Tonne per Annum (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 for TORs/ Environment Clearance/ CRZ Clearance involving violation of the Environment (Protection) Act, 1986/ Environment Impact Assessment (EIA) Notification, 2006 / Coastal Regulation Zone (CRZ) Notification, 2011

The cases for granting Environment Clearance / CRZ Clearance for such



Fig-26. Oriental Skylark (*Alauda gulgula*) – found in open grassland and near waterbodies

projects are at present being dealt with in terms of OM of even number dated 16.11.2010. Now, it has been decided in that in supersession of this OM, the procedure henceforth stated in this OM will be followed while dealing with such cases. The violations could come to the notice of the Ministry at various stages of processing of the proposals, i.e.:

- Processing the case in the Ministry before referring the same to the Expert Appraisal Committee (EAC) for TOR / Environment Clearance / CRZ Clearance;
- During the deliberations in the EAC meeting and recorded as such in the minutes of the meeting; and;
- Processing the case in the Ministry after the receipt of recommendations of the EAC but before granting TOR / Environment Clearance/CRZ Clearance.

As soon as any case of violation comes / is brought to the notice of the Ministry

1 EAC, the Ministry / EAC will proceed to verify the veracity of the complaint through the concerned Regional Office of MoEF / State Government / CZMA. Of course, such a verification will not be required in case the project proponent does not contest the allegation of violation. Once the Ministry EAC is satisfied that it is a violation case, before proceeding any further in the matter, the following will need to be ensured in the matter:

- (i) The matter relating to the violation will need to be put up by the Project Proponent to the Board of Directors of its Company or to the Managing Committee / CEO of the Society, Trust, partnership / individually owned concern 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 to ensure that violations will not be repeated. For this purpose, a time limit of 60 days will be given to the project proponent.

In the meantime, the project will be delisted. In the eventuality of not having any response from the project proponent within the prescribed limit of 60 days, it will be presumed that it is no longer interested in pursuing the project further and the project file will be closed, whereafter the procedure will have to be initiated *de novo* by such project proponents.

- (ii) The State Government concerned will need to initiate credible action on the violation by invoking powers under Section 19 of the Environment (Protection) Act, 1986 for taking necessary legal action under Section 15 of the Act for the period for which the violation has taken place and evidence provided to MoEF of the credible action taken.
- (iii) The details of the project proponent and a copy of the commitment, etc., mentioned at (i) above will be put on the website of MoEF for information of all stakeholders.

Once action as per para i, ii & iii above has been taken, the concerned case will be dealt with and processed as per the prescribed procedure for dealing with cases for grant of TORs / Environment Clearance / CRZ Clearance and appropriate recommendation made by the EAC/ decision taken by the Ministry as per the merit of the case.

It may be clarified that the consideration of proposals for giving TORs / Environment clearance / CRZ clearance for violation cases will not be a matter of right for the project proponent. In cases of serious violations, the Ministry reserves the right to outrightly reject such proposals and not consider the same at all.

The aforesaid procedure, will apply *mutatis mutandis* to the cases handled at the State level by the State Environment Impact Assessment Authorities (SEIAAs)/ State Level Expert Appraisal Committees (SEACs).

– **Firm coal linkage**

As per the policy decision taken project proponents are required to indicate firm coal linkage along with detailed information regarding the quality of coal to assess the environmental impacts of a Thermal Power Projects and other projects which are largely dependent on coal as a raw material. The linkage/FSA must provide the details of the coal quality parameters, specifically (i) calorific value; (ii) sulphur content and (iii) ash content and such other parameters as may be prescribed by MoEF from time to time. The quality of coal to be used in the project should be taken into consideration while preparing the environment impact assessment (EIA) report and carrying out the environmental appraisal.

The calorific value of coal would determine the quantity of coal requirement per unit of power generation, ash content would determine the land requirement for the ash pond as also the water consumption for its disposal in slurry mode and sulphur content would impact on the SO_x emissions which, in turn, would affect the air quality.

It is clarified that the coal linkage could either be in the form of a linkage through a specific mine or a basket of mines or through dedicated coal block, in the form of linkage accorded by Standing Linkage Committee of the Ministry of Coal or a fuel supply agreement. Further, it would be necessary to indicate the location of

mine as this would determine the necessity of using beneficiated washed coal.

In the eventuality of change in coal parameters with respect to the parameters based on which EIA was prepared, it would be necessary that the project is referred back to MoEF to revisit the environment clearance granted earlier so as to assess the adequacy of the conditions already stipulated and to incorporate any additional condition as may be necessary in the interest of environment protection including provision of FGD for control of SO_x emissions.

In view of the above a policy decision was taken vide the Ministry Circular dated November 01, 2010, wherein, a firm coal linkage is essential for consideration of power projects seeking environmental clearance. It was also clarified by the said circular that after the status of environmental and forestry clearances of the linked coal block/coal mine is known.

The said decision was reviewed and a slight amendment was made wherein, it has now been decided that environmental clearance for thermal power project for linked coal block/coal mine will be processed based on the status furnished by the project proponent on the status of EC/FC of the linked coal block / coal mine and in line with the parallel processing being adopted for granting environmental clearance of projects where forestry clearance is also required i.e having convergence at the last step. However, EC would be issued only after Stage-I forestry clearance for linked mine has been issued.

Coal Mining Sector

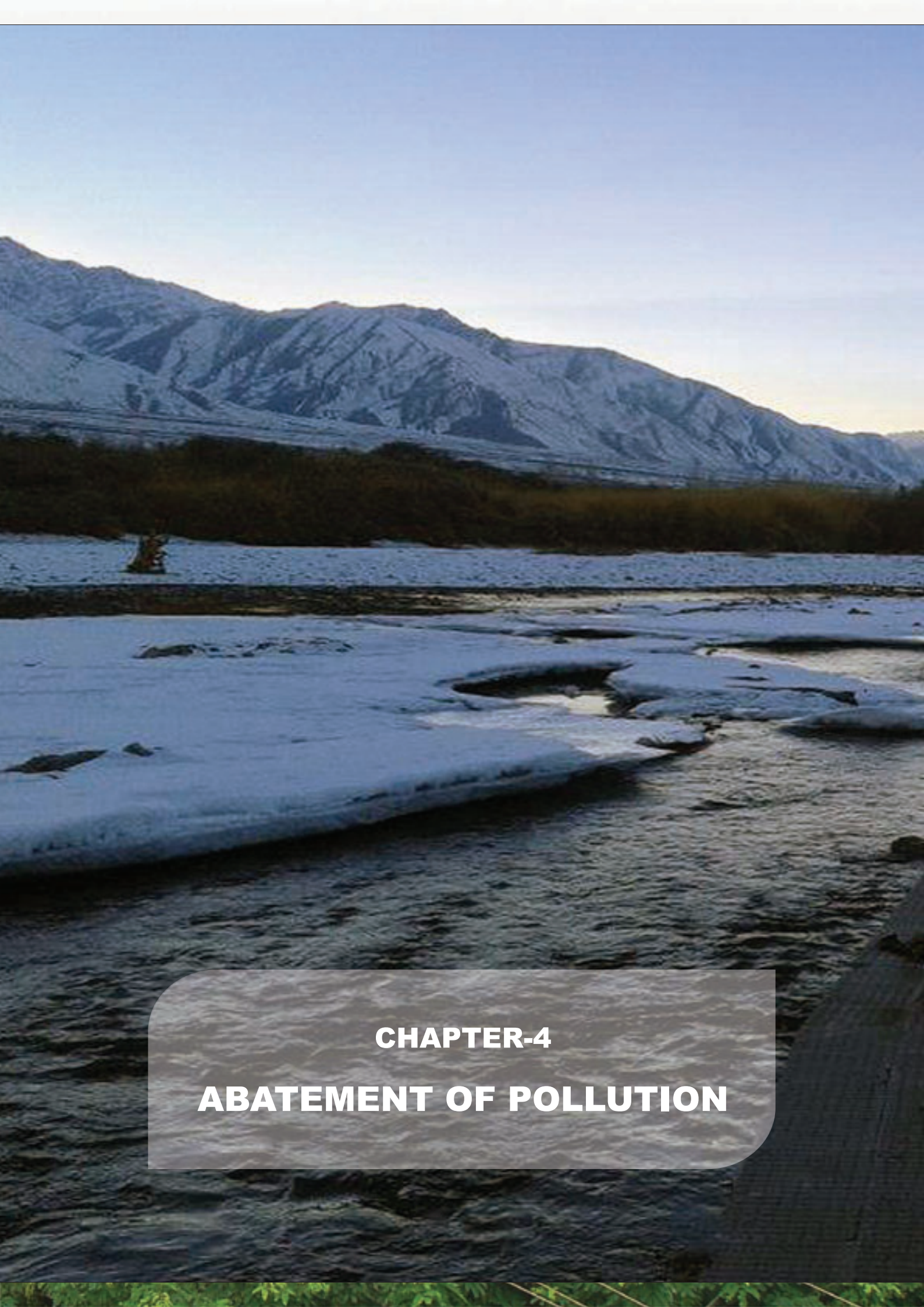
Ministry continues to consider coal

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 2012-13.

OM dated 19.12.2012 has been issued giving guidelines to EAC with regard to exempting public hearing for capacity expansion proposals of existing coal mining projects, which have obtained environment clearance and which are for one time capacity expansion of up to 25% in the existing mining operation, within the existing mine lease area.

Mining of soil/earth from borrow areas

OM dated 18.12.2012 has been issued relating to rationalization of procedure for EC for highway projects involving borrow areas for soil and earth. This is with a view to obviating the need for obtaining a separate environment clearance for mining of soil/earth from borrow areas which form part of a highway project.



CHAPTER-4
ABATEMENT OF POLLUTION

Control of Pollution

Introduction

The concern for environmental quality has become the topmost 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, 560 ambient air quality monitoring stations are operational covering 223 cities, towns and industrial areas in 26 States and five Union Territories. Presently, three out of five criteria pollutants namely; sulphur dioxide (SO₂), nitrogen dioxides (NO₂) and fine particulate matter having size less than 10 micron (PM₁₀) 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 37 manual monitoring stations covering 8 new cities and towns have been added in the network under NAMP during the 2012-13.

- The Government has published the Revised National Ambient Air Quality Standards, 2009 (NAAQS-2009) in the official Gazette on 16th November, 2009. These ambient air quality standards/ limits provide a legal framework for the control of air pollution and the protection of public health.
- 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 (SO₂) are within the prescribed air quality norms across the country and that of Nitrogen Dioxide (NO₂) are within norms in most of the cities. However, the levels of fine particulate matter (PM₁₀) exceed the prescribed norms in many cities including Delhi. PM₁₀ and NO₂ are the emerging air pollutants.

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, Bengaluru, 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 framework 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 PM₁₀ 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 resuspension 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, State Pollution Control Board (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 PM10 and PM2.5 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

- 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). The source specific emission standards have been notified for Petrochemicals Plants (09.11.2012). During the year, Standards in respect of following category of industries / equipments have been evolved and are being finalized for notification:
 - Effluent & Emission Standards for Dye & Dye Intermediate.
 - Emission Standards for Cement Plants;
 - Emission Standards for Generators (Diesel); and
 - Emission Standards for Generators (Petrol)
- 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 11th 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 to monitor ambient noise on 24 X 7 basis. Monitoring data is available on the website of respective State Pollution Control Board and CPCB.

Assistance for Abatement of Pollution

- The scheme of Assistance for Abatement of Pollution was conceptualized in 1992 during the 7th Five-Year Plan with the objective inter alia to strengthen the CPCB and SPCBs for enforcing statutory provisions for pollution abatement. The scheme is now a part of a centrally sponsored umbrella scheme of 'Pollution Abatement'. The scheme of assistance for pollution abatement comprise of sub-components are 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 and North Eastern

Region Grants for creation of Capital Assets

- The Scheme provides 100% grant to SPCBs/PCCs, 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.
- The scheme has been approved by the Standing Finance Committee in the Ministry. The salient features are as follows:
 - Grant for lab up-gradation/purchase of equipment would be provided to the weaker SPCBs/PCCs only as identified in SFC memo.
 - Salary support will be restricted to scientific and technical staff of the SPCBs of North-Eastern Region and all PCCs.
 - Grant for construction of office-cum -laboratory building would be restricted to SPCBs of North Eastern Region and the weaker PCCs as identified in SFC memo.
 - Capacity Building of SPCBs/PCCs including other environmental organisations by imparting training and education through State Department of Environment and Autonomous

- Institutions/Statutory Bodies under the Central and State Government.
- Awareness and education generation, compliance assistance amongst SMEs should be done through CPCB/SPCBs and State Department of Environment and Autonomous Institutions/Statutory Bodies under the Central and State Government.
 - Technical Studies for R&D, survey and documentation for creation of environmental database and consultation in the area of pollution abatement will be expedited through State Department of Environment and Autonomous Institutions/Statutory Bodies under the Central and State Government.
 - Seminars/Workshops/Conference in the area of pollution abatement through State Department of Environment and Autonomous Institutions/Statutory Bodies under the Central and State Government.
 - No support will be extended to the NGOs under this scheme.
 - During this year (2012-13), an allocation of ₹ 7.00 crore in the BE was made for providing financial assistance to the on-going/new projects. Against this allocation, expenditure is ₹ 1.42 crore. The assistance has been extended to six State Pollution Control Boards/ Pollution Control Committees during 2012-13.
 - The approved XII Five Year Plan allocation for this scheme is ₹60.

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 9th 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.

Recently, the Government of India, Ministry of Petroleum and Natural Gas (MoPNG) has constituted an Expert Committee for preparing a draft Auto Fuel Vision & Policy 2025.

Recognition of Environmental Laboratories under Environment (Protection) Act, 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

4

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) A, 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.moef.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 Laboratories is meeting once in every month to discuss all the cases of Govt. and Private Sector 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.
- Procurement of ISO 9001:2008 and OHSAS 18001:2007 have been made mandatory for all laboratories to be considered for recognition under E(P) Act, 1986
- During the year, 17 private sector Labs were visited for considering recognition under E(P)A, 1986. Twelve Labs were recommended for recognition under E(P) Act, 1986 during the year. Surveillance

visits of twelve more recognized Labs were undertaken.

- Orientation Workshops on revised guidelines for recognition of environmental laboratories under E(P) Act, 1986, were organized. The first such Orientation Workshop was organized at CPCB-HQ and the second at CPCB-ZO, Bengaluru.

Scheme of Common Effluent Treatment Plants (CETPs)

- The concept of the Common Effluent Treatment Plants (CETPs) 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 (CSS) has been undertaken by the Government for enabling small scale industries (SSI) to set up new and upgrade the existing Common Effluent Treatment Plants to cover all the States in the country. This CSS of CETPs has since been revised by the Ministry. The revised scheme has been approved by the Expenditure Finance Committee (EFC) and the Ministry of Finance.

The salient features of the revised scheme are as follows:

- The Central subsidy has been enhanced from 25% to 50% of the project cost.
- All the three levels of treatment, primary, secondary and tertiary are to be covered for assistance. Progressive technologies like Zero Liquid Discharge will also be considered for assistance, subject to a ceiling.
- The management of the CETP is to be entrusted to a Special Purpose Vehicle registered under an appropriate statute.
- Performance guarantee at full design load is to be ensured upfront.
- During this year (2012-13), an allocation of ₹ 6.00 crore in the BE was made for providing financial assistance to the ongoing/new CETP projects against which expenditure, so far, is ₹ 422 lakhs. Financial assistance was provided for the ongoing projects of CETPs at Tarapur, Maharashtra and new project at Palsana (upgradation), Gujarat.
- The approved outlay for XII Five Year Plan for this scheme is ₹ 100 crore.

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 ₹ 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 (TTZ)" submitted by NEERI, Nagpur has been 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 ₹ 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 Five Year Plan would be taken up with the Planning Commission. Till date no comprehensive proposal has been received from the Government of U. P.
- 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 interaction 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

Charter on Corporate Responsibility for Environmental Protection (CREP)

- Adoption of pollution control technologies could be successfully achieved through a coordinated approach in which industrial

adopting necessary pollution abatement measures.

Critically Polluted Industrial Clusters/ Areas

The Ministry of Environment & Forests (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-29.

Table-29. The CEPI scores for Critically Polluted Industrial areas/clusters

S. No.	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 (Odisha)	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 (including Anand Parvat, Naraina, Okhla and Wazirpur), 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

S. No.	Industrial Cluster/Area	AIR	WATER	LAND	CEPI
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)	52.00	65.50	54.00	75.19
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 (Odisha)	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 (Odisha)	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

Based on the identification of industrial clusters/areas by the CPCB as critically or severely polluted, Ministry of Environment & Forests vide Office Memorandum dated 13th January, 2010 have imposed a temporary restriction for a period of eight months up to August, 2010, on consideration of developmental projects for environmental 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 been lifted in twenty five areas / industrial clusters, whose action plans have been finalized by CPCB. The State-wise list of Critically Polluted Areas (CPA) where moratorium has been lifted is given at Table-30.

Table-30. List of Critically Polluted Industrial clusters where moratorium has been listed.

State	No of CPA	Industrial clusters / areas	Moratorium lifted on
Andhra Pradesh	1	Patancheru-Bollaram	26.10.2010
Gujarat	3	Vapi Bhavnagar Junagarh	26.10.2010 15.02.2011 31.03.2011
Haryana	2	Faridabad Panipat	31.03.2011 31.03.2011
Karnataka	2	Mangalore Bhadravati	23.05.2011 23.05.2011
Kerala	1	Cochin	23.05.2011
Madhya Pradesh	1	Indore	31.03.2011
Maharashtra	4	Dombivalli Aurangabad Navi Mumbai Tarapur	15.02.2011 15.02.2011 15.02.2011 26.10.2010
Odisha	3	Angul Talchar Ib valley Jharsuguda	31.03.2011 05.07.2011 05.07.2011
Punjab	2	Ludhiana Mandi Gobind Garh	15.02.2011 26.10.2010
Tamil Nadu	2	Cuddalore Coimbatore	15.02.2011 26.10.2010
Uttar Pradesh	5	Ghaziabad Singrauli Noida Agra Varanasi-Mirzapur	31.03.2011 05.07.2011 31.03.2011 15.02.2011 15.02.2011

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.

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 29th January, 1998 vide S.O. No. 93(E) dated January 29, 1998 under the Chairmanship of Shri. Bhure Lal. The tenure of the EPCA was extended from time to time, and at present extended upto 28th January, 2014.

– 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 S.O 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 28th 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 nationwide programmes for the prevention and 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;
- Development of charter/requirements for Corporate Responsibility for Environmental Protection (CREP) for 17 major polluting

industrial sectors and monitoring their implementation through EIGHT task forces and steering committees;

- Action plans for improvement of environment in 88 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

Measurement of Hazardous Organic Compounds Dioxin (PCDDs) and Furan (PCDFs) in Environmental Samples

Polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzo-furans (PCDFs) are environmental contaminants usually present in diverse environmental

matrices. Out of 75 theoretically possible PCDD congeners and 135 PCDF congeners, 7 PCDD congeners and 10 PCDF congeners are having considerable toxicity. These congeners are monitored as per internationally practiced convention (WHO-TEF) in environmental matrices, which may vary from sub ppt level and may reach up to ppm level. Under the purview of project, the following sub-activities have been executed by National Reference Trace Organics Laboratory of Central Pollution Control Board:

- Monitoring of Dioxin – Furan in Stationary Source Emissions

The monitoring of Dioxin – Furan in stationary source emission at Incinerators of Treatment Storage and Disposal Facilities (TSDFs), Incinerators of organic chemical manufacturing units and Bio-medical waste incinerators have been undertaken on request of Hazardous Waste Management Division, State Pollution Control Boards, Pollution Control Committees etc.

- National Ambient Air Dioxin Monitoring Program

Ambient air dioxin – furan monitoring program being continued by National

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Fig-27. Source Emissions Monitoring

Table-31. Identified Critically Polluting Areas (CPAs) in the country

S. No.	Monitoring Responsibility HQs / Zonal Offices	State	Identified Critically Polluted Areas for Monitoring
1.	National Reference Trace Organics Laboratory, HQs Delhi	Punjab	Ludhiana
		Uttar Pradesh	Ghaziabad
		Haryana	Bhiwadi
		Madhya Pradesh	Singrauli
		Chhattisgarh	Korba
2.	CPCB Zonal Office – Vadodara	Gujarat	Ankleshwar and Vapi
		Maharashtra	Chandrapur
3.	CPCB Zonal Office – Bengaluru	Tamilnadu	Vellore
4.	CPCB Zonal Office - Kolkata	Odisha	Angul - Talchar

Reference Trace Organics Laboratory of Central Pollution Control Board at ten identified Critically Polluting Areas (CPAs) in the country in association with CPCB Zonal Offices at Bengaluru, Kolkata and Vadodara (Table-31).

The vapour phase and particulate phase Dioxin & Furan ambient air sampling has been performed by Polyurethane Foam High Volume Sampler (PUF-HVS) at identified locations within the Critically Polluted Areas (CPAs) on quarterly intervals.

During year 2012-2013, four quarterly Vapour phase and particulate phase samplings have been completed at remaining identified critically polluted areas. The collected vapour phase and particulate phase samples have been subjected to extraction of dioxin-furan from the sampling media and removal of interference organic compounds. The sample extracts after clean-up have been analysed by High Resolution Gas Chromatograph with High Resolution Mass Spectrometer (HRGC-HRMS) for Dioxin-Furan 17 congeners. The analytical data being compiled for Assessment of Status of Ambient Dioxin / Furan.

Volatile Organic Compounds (VOCS) Measurement in Drinking / Surface Water Samples by Purge and Trap GC-MS

Volatile Organic Compounds (VOCs) are carbon-containing compounds that readily evaporate at normal air temperature. Fuel oils, gasoline, industrial solvents, paints, and dyes are the major sources of VOCs. US-EPA lists 68 most common VOCs for environment assessment from the known sources. These 68 VOCs cover a wide range of chemical compounds that have different chemical and physical properties and different levels of toxicity. Chlorinated VOCs are associated with commercial and industrial use and include dozens of chemicals that are typically very mobile, persistent, and toxic in the environment. Non-chlorinated VOCs are associated with gasoline, fuel oils, and industrial solvents. These non-chlorinated chemicals are persistent, volatile, but less toxic than the chlorinated solvents. VOCs are very mobile and these may be dissolved and washed out with runoff water reaching surface water resources and may also leach into the ground water.

During year 2012 – 2013, three rounds of monitoring have been undertaken by National Reference Trace Organics Laboratory of Central

Pollution Control Board in ground and surface water locations at Most Critically Polluted Areas of country viz. Ankleshwar, Vapi (Gujarat), Ghaziabad (U.P.), Chandrapur (Maharashtra) and Korba (M. P.). The water samples collected have been analyzed for 43 VOCs by Purge & Trap concentration followed by GC-MS analysis using USEPA Method 524.2. The analytical data is under compilation.

Assessment of Poly-Chlorinated Biphenyls (PCBS) in Water and Bottom Sediments of River Yamuna in Delhi

Polychlorinated Biphenyls (PCBs) are chlorinated organic compounds with one to ten chlorine atoms attached to biphenyl molecule. Individual chlorinated biphenyl molecules are called congeners, which are identified by the number and position of the chlorine atoms around the biphenyl molecule. PCBs were mainly used as insulating liquid in electric equipments prior to ban on their manufacture during seventies. However, several other uses of PCBs such as sealants, carbonless printing and plasticizers may be the possible sources of their release into the environment.

The assessment of PCBs levels in water and bottom sediments of river Yamuna in Delhi have been undertaken on quarterly basis by National Reference Trace Organics Laboratory of Central Pollution Control Board during the year 2012-2013. River water samples and bottom sediment samples were collected from five locations from Delhi Stretch of River Yamuna i.e. Palla, Wazirabad, Rajghat, Nizamuddin and Okhla. 28 individual congeners of PCBs, selected based on their toxicological significance, prevalence in biological tissue, were analyzed with GC-ECD. Concentrations of Total PCBs (28 congeners) in Yamuna River bottom sediment samples in Delhi varied from 0.051 µg/kg to 3.060 µg/kg

with the mean of 0.631 µg/kg. The Total PCBs analyzed in river water have been found Below Detection Limit most of time except once (0.005 µg/l) at Rajghat monitoring location, while in river sediments also, the Total PCBs have been found very low and were well within the Total PCBs Guidelines value of 227 µg/kg of United States. The contamination of PCB congeners in sediments samples may be due to confluence of untreated or partially treated domestic / industrial wastewater through several drains in the river.

Monitoring of Pesticide Residues at National Level - Sponsored Project by Ministry of Agriculture, New Delhi

Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, New Delhi and nodal department i.e. Project Coordinating Cell, All India Network Project (AINP) on Pesticide Residues, Indian Agricultural Research Institute New Delhi has been continuously sponsoring a project "Monitoring of Pesticide Residue at National Level" to Central Pollution Control Board, Delhi since October, 2006. The objective of the study is to evaluate pesticides levels in ground water, surface water and soil samples in National Capital Territory Delhi. About 112 locations of surface water and 100 locations for the Soil Samples have been selected and Monitored in National Capital Region i.e. Uttar Pradesh (Ghaziabad, Guatam Budh Nagar & Bagpat), Haryana (Sonapat, Faridabad & Ballabgarh) and Delhi (Alipur Block, Kanjhawala Block, Najafgarh & Nizamuddin Bridge). During the year, the Monitoring of Pesticide Residue has been undertaken on monthly basis in about 70 surface water samples. The following groups of Pesticides being monitored on monthly basis:

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Pesticide group	Pesticides monitored (33 Nos.)
Organochlorine Pesticides: (14 Nos.)	α -HCH, β -HCH, γ -HCH, δ -HCH, Endosulfan-I, Endosulfan-II, Endosulfan sulfate, Dicofol, <i>p,p'</i> -DDE, <i>p,p'</i> -DDD, <i>p,p'</i> -DDT, Aldrin, Dieldrin, Heptachlor
Organophosphorous pesticides: (9 Nos.)	Chlorpyrifos, Dimethoate, Ethion, Malathion, Methylparathion, Phorate, Phosphamidon, Quinolphos, Profenophos
Synthetic Pyrethroids: (6 Nos.)	α -Cypermethrin, Deltamethrin, Fenpropethrin, Fenvalerate, λ -Cyhalothrin, β -Cyfluthrin
Herbicides: (4 Nos.)	Pendimethalin, Alachlor, Butachlor, Fluchloralin

Assessment of Persistent Organic Pollutant Residues (POPs) in Human Population of Delhi with Special Reference to Adverse Health Effects and Morbidity (Collaborative Project between CPCB and UCMS & GTB Hospital)

Persistent Organic Pollutants (POPs) are carcinogenic compounds of anthropogenic origin that resist degradation, persistent in the environment and accumulate in the food chain. These are linked to many health and environmental effects. Stockholm Convention has identified 12 POPs such as Organo chemicals viz. DDT, Aldrin, Dieldrin, Endrin, Chlorodane, Heptachloro, Mirex, Texaphene; industrial chemicals, like PCBs, HCB and combustion by products – Dioxin & Furan for priority action. Persistent Organic pollutants exposure to human being through food, water, accidents and occupational environment is a common phenomena because of which these are of global concern.

Most of the organo-chlorine pesticides Persistent Organic Pollutants are persistent toxic contaminant having long half-life and tendency to be absorbed in human body through skin, inhalation, oral and placental route and tend to accumulate in fatty tissues. Women having higher body fat percentage are prone to bioaccumulation of pesticides due

to exposure. The hormonal changes during pregnancy, lactation and menopause, mobilizes the bio-accumulated pollutants in the body. The organo-chlorine pesticides can interfere in normal endocrine system, resulting into reproductive disorders and breast cancers.

The study has been undertaken by Central Pollution Control Board since 2008-2009 onward in collaboration with University College of Medical Sciences (UCMS) as collaborative project 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. The salient objectives of the project are:

- Determination of blood POPs levels such as organo-chlorine pesticides in infants with special reference to pre-term and IUGR infants.
- Determination of blood POPs levels such as organo-chlorine pesticides, organo-chlorine residue levels in children and teenagers of various age groups.
- Determination of blood and tissue organo chlorine and Polychlorinated biphenyls (PCBs) residue levels in adult and senior

citizen populations with special reference to breast cancer tissue and prostate cancer patients.

During the three years project duration, blood samples from different age group such as infants children, teenagers, adult, and senior citizens were collected, processed extracted and cleaned up at University College of Medical Sciences & GTB Hospital laboratories and the concentrated samples were analyzed with Perkin Elmer GC-ECD at National Reference Trace Organics Laboratory of Central Pollution Control Board. The blood samples analysis results indicated presence of Organo-chlorine pesticides, Total BHC, Endosulfan and Total DDT in the adults of age group 40-60 years and senior citizens of age more than 60 years. There has been increasing pattern in pesticide levels in various age groups from infants to senior citizens. The pesticide Heptachlor was recorded in only one blood sample of adult in the 20-40 age group. The blood samples drawn from infants, children and teenagers were comparatively free from pesticides residue. The report of the study has been finalized in collaboration with UCMS & GTB Hospital and submitted to CPCB.

Inter-laboratory Proficiency Testing (PT) participation for analysis of physico-chemical and trace organics parameters including Dioxin & Furan

Quality assurance is the definite programme for laboratory operation that specifies the measures required to produce reliable data of known precision and accuracy. Quality system which includes quality assurance policies and all quality control processes to ensure the quality of analytical data produced by the laboratory and to demonstrate the competence of the laboratory.

To maintain the quality assurance, Central Pollution Control Board HQs and five Zonal Office (Lucknow, Vadodara, Bengaluru, Kolkata and Bhopal) Laboratories have participated in Interlaboratory PT programme conducted by M/s Environmental Resource Associates (ERA), USA (A Waters company) during October / November, 2012 with coverage of various Physico-chemical, Microbiological, Chemical, Trace organics parameters, and Air parameters. In addition, the National Reference Trace Organics Laboratory has also participated in International PT Programme for Dioxin & Furan conducted by Centre D'Expertise En Analyse Environmental Du Quebec, Canada and achieved good performance. The performance of the laboratories have been good, except few parameters for which corrective action being undertaken.

Environmental Laboratories Development

Central Pollution Control Board, Delhi has been delegated the powers by Government of India vide Gazette Notification No. SO 145 (E) dated February 21, 1991 for recognition of environmental laboratories of Govt. / Semi Govt. organization Public Sector Undertaking and Educational Institutions under section 12(1) (b) & 13 to carry out the functions entrusted to the Environmental laboratories under the Environment (Protection) Act, 1986.

Ministry of Environment & Forests has constituted the Expert Committee at Central Pollution Control Board for the purpose. The Central Pollution Control Board has organized six (6) meetings of Expert Committee during the year 2012-2013 (upto January, 2013) for assessment, review and recommendation of cases of private / government laboratories for recognition.

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Private Sector Laboratories

Central Pollution Control Board has participated in joint inspections of private laboratories alongwith Ministry of Environment & Forests (MoEF) and respective State Pollution Control Boards for consideration of recognition of private environmental laboratories under the Environment (Protection) Act, 1986 during the year 2012 – 2013:

- M/s Envirocare Labs Pvt. Ltd., Enviro House, Thane, Maharashtra (10th April, 2012)
- M/s Netal (India) Ltd., TTC Industrial Area, Navi Mumbai, Maharashtra (11th April, 2012)
- M/s Team Test House, Sitapura Industrial Area, Jaipur, Rajasthan (24th May, 2012).
- M/s Avon Food Lab, Lawrence Road Industrial Area, New Delhi (1st June, 2012).
- M/s Mineral Engineering Services, Bellary, Karnataka (14th June, 2012)
- M/s Nilawar Laboratories, Waddhamana, Nagpur, Maharashtra (20th June, 2012)
- M/s Earthcare Labs Pvt. Ltd., Prashant Nagar, Nagpur, Maharashtra (21st June, 2012)
- M/s Enviro International, Eco Tech-III, Greater Noida, U. P. (19th July, 2012).
- M/s EMTRC Consultants Pvt. Ltd., UPSIDC, Ghaziabad, U. P. (26th July, 2012).
- M/s Skylab Analytical Laboratory, Kalyan (West), Maharashtra (5th September, 2012)
- M/s Aavanira Biotech, Bhosari, Pune, Maharashtra (6th September, 2012)
- M/s Insta Pollutech Laboratories, Dhayanigaon, Pune, Maharashtra (7th September, 2012)

- M/s Eko Pro Engineers Pvt. Ltd., Ghaziabad, U. P. (19th September, 2012)
- M/s Shriram Institute for Industrial Research, University Road, Delhi (27th September, 2012).
- M/s Shiva Test House, Gardanibagh, Patna, Bihar (4th October, 2012)
- M/s San Envirotech Pvt. Ltd., Paldi Cross Road, Ahmedabad, Gujarat (11th October, 2012).
- M/s Universal Enviro Associates, Musheerabad, Hyderabad, A. P. (31st October, 2012)
- M/s Paryavaran Labs, Madhapur, Hyderabad, Andhra Pradesh (1st November, 2012)
- M/s JSL Stainless Ltd, Danagadi, Distt. Jaipur, Odisha (10th January, 2013)
- M/s Visiontek Consultancy Services Pvt. Ltd., Bhubaneswar, Odisha (11th January, 2013)

Environmental Research Activities:

Analytical Quality Control (AQC/Water) for Central and State Pollution Control Boards, Pollution Control Committees and for laboratories recognised under Environment Protection Act

The most important mandatory task of Central Pollution Control Board (CPCB) is to maintain vast water quality monitoring network with a aim to evaluate the status of water quality of different sources. In this programme the CPCB is monitoring 1019 water quality monitoring stations under GEMS, MINARS, GAP and YAP Programmes comprising rivers, lakes, wells, and ground waters spread over 27 States and 6 Union Territories through various State Pollution Control Boards (SPCB). Comparability of data within the collaborative programme become the key challenge to the

water testing laboratories. The quality of data must be of the desired quality to formulate the policy by the decision maker based on the data generated in the monitoring programmes. Therefore, to obtain relevant and reliable data, the analytical process has to proceed under a well established quality assurance with external proficiency test as an inherent component. To ensure the reliability of the data, a programme called "Analytical Quality Control (AQC)" was initiated with 20 laboratories in 1991. In 2012-13, number of laboratories participated in this exercise have reached to 220 number (under, E.P. Act recognized) laboratories. As on 11th February 2013, 28th rounds of exercises were conducted and performance reports were communicated to the participating laboratories. There are 21 physico-chemical parameters covered under this scheme. The performance of the laboratories in the 28th Exercise for physico-chemical parameters ranged between 70 to 80%.

Two synthetic samples labeled as A & B of each 1 litre volume prepared in laboratory by adopting standard procedures and precautions are distributed to all participating laboratories by Courier service to avoid any transport delay. Samples were also analyzed in CPCB laboratory for arriving at "Reference value" for comparison and to estimate the acceptable limits of the reported values.

Recommendations for AQC Scheme

The overall findings of the performance of AQC exercises reveal the fact that Internal AQC system in all the laboratory is to be strengthened. The analytical capability of these laboratories could be improved by adopting the following major steps.

- Strengthening of the Internal AQC System

Table-32. List of parameters covered under AQC/Water Programme (27th & 28th exercise) by CPCB, Delhi, during 2012-13

S. No.	Parameter
1.	Conductivity
2.	Total Dissolved Solids
3.	Fixed Dissolved Solids
4.	Total Hardness
5.	Calcium
6.	Magnesium
7.	Sodium
8.	Potassium
9.	Chloride
10.	Fluoride
11.	Sulphate
12.	Nitrate-N
13.	Ammonical-N
14.	Total Kjeldahl Nitrogen
15.	Phosphate-P
16.	Chemical Oxygen Demand
17.	Biochemical Oxygen Demand
18.	Boron
19.	Chromium
20.	Total Suspended Solid
21.	pH

- Periodic calibration of instruments
- Using high quality chemicals and providing adequate quantity of glassware
- Providing good quality distilled water
- Improving the laboratory work atmosphere
- Providing analytical training to laboratory analysts.
- Conducting Regional Workshop at various regions

- Adopting good quality assurance system
- Participating in Inter-laboratory AQC exercises by all laboratories of Pollution Control Boards and Committees.

Pilot Plant Study using Sludge-Reagent-Product (SRP) Technology

An innovative technology called "Sludge-Reagent-Product (SRP) Technology" has been 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 indeed yielded 80 to 90% recovery of chemical coagulant (alum) from discarded alum-treated-sludge for recycling and reuse. The substitute of fresh alum with the recovered alum in the tune of 90-95% for treating the water increased eco-efficiency with both economic and environmental benefit as reflected from the saving of ₹ 550 million per year and reduction of sludge to the tune of 60 - 70% to be discharged. The volume of sludge is reduced by removing the moisture from the sludge (thickener). In sludge, moisture content is almost 20 percent of the treated water used for the treatment. The about 80 % of total moisture is removed from the sludge and that is used for drinking purpose. Removal of moisture makes the sludge handling more convenient. Finally the study focused a number of opportunities in waste minimization and pollution prevention areas aimed a sustainable development.

The treatment technology entitled "An Integrated Plant for Treatment of Raw Water Using Discarded Sludges to Produce Drinking Water" has been patented vide Indian Patent No. 215808, Filed in April 2001 and Granted in March 2008.

The study integrates the waste of treatment plant in Delhi in such a way that

sludge of their treatment plant becomes raw material. This utilization indeed yielded increased eco-efficiency with economic and environmental benefit as well as prevented pollution of environmental component. This renovated technology, the consumption has been reduced upto 95% and discharge of wastewater also reduced to zero (i.e. zero wastewater discharged technology).

Construction work for 0.5 MLD pilot water treatment plant, based on SRP technology at Bhagirathi Water Works (Delhi Jal Board), Yamuna Vihar, Delhi is completed. The pilot plant is under trial running and will be ready for demonstration of SRP technology within March 2013.

Status and Progress of National Water Quality Monitoring Programme

National Water Quality Monitoring Programme: Central Pollution Control Board in collaboration with State Pollution Control Boards has established a Water Quality Monitoring Network in order to plan policies for prevention and control of pollution. The monitoring of water quality initiated during 1977-78 under Global Environmental Monitoring System (GEMS) and gradually increased the network to cover all the aquatic resources.

Objective of Monitoring: Objectives of monitoring is the rational planning of pollution control strategies and their prioritisation; evaluate effectiveness of pollution control measures already in existence; evaluate water quality trend over a period of time; assess assimilative capacity of a water body thereby reducing cost on pollution control; understand the environmental fate of different pollutants and to assess the fitness of water for different uses in order to plan policies for prevention and control of pollution.

Monitoring Network: Present network comprises of 2500 stations in 28 States and 6 Union Territories. Water Quality monitoring has been carried out at 2500 locations (2012-13) covering 445 Rivers (1275 locations), 154 Lakes (190 locations), 78 Ponds (79 locations), 41 Creeks/Sea Water (41 locations), 45 Drains (45 locations), 25 Canals (41 locations), 12 Tanks (12 locations), 10 Water Treatment Plants- Raw Water (10 locations) and 807 Wells. Monitoring is carried out with a frequency on monthly, half yearly and yearly basis. One thousand six hundred eighty seven (1687) locations are monitored on monthly basis, 807 locations on half yearly basis and 6 locations on yearly basis.

Parameters observed: Water samples are analysed for 9 core, 19 general parameters, 9 trace metals and set of pesticides.

Achievement of Monitoring Programme: Water quality data is used for identification of polluted water bodies, formulation of River Action Plan and identification of pollution sources in 187 cities for interception, diversion and treatment of municipal wastewater and stricter surveillance of industrial sources. Water quality data is also used for Query Response i.e. to reply Parliament Questions, VIP reference, Public Queries, Public Interest Litigation filed in Supreme Court and Various High Courts and to fulfil the requirement of Non-Governmental Organisation, Students, and Researchers.

Water Quality Assessment: Monitoring results obtained based on present network indicate that organic pollution continues to be the predominant source of pollution of aquatic resources. The organic pollution measured in terms of bio-chemical oxygen demand (BOD) & Coliform bacterial count gives the indication of extent of water quality degradation in different

parts of our country. It is observed that nearly 60% of the observations are having BOD less than 3 mg/l (Criteria limit), 22% between 3-6 mg/l & 18% above 6 mg/l. Similarly Total & Faecal coliform which indicate presence of pathogens in water are also a major concern. About 46% observations are having Total Coliforms and 68% observations are having Faecal Coliform less than 500 MPN /100 ml (Criteria limit).

Perspective Planning: Strengthening of monitoring network to cover 5000 locations during 12th Plan and perspective plan to achieve 10000 locations is envisaged.

Way Ahead: The limitations of grab sampling has to overcome by automation in monitoring to observe diurnal variation and to assess episodal pollution.

National Air Quality Monitoring Programme (NAMP)

In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981. According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 'Air pollution' has been defined as 'the presence in the atmosphere of any air pollutant.' As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 'Air Pollutant' has been defined as 'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment'. Therefore ambient air quality standard is developed as a policy guideline that regulates the effect of human activity upon the environment so that pollutant emission into the air can be regulated. Standards may specify a desired state or limit alterations.

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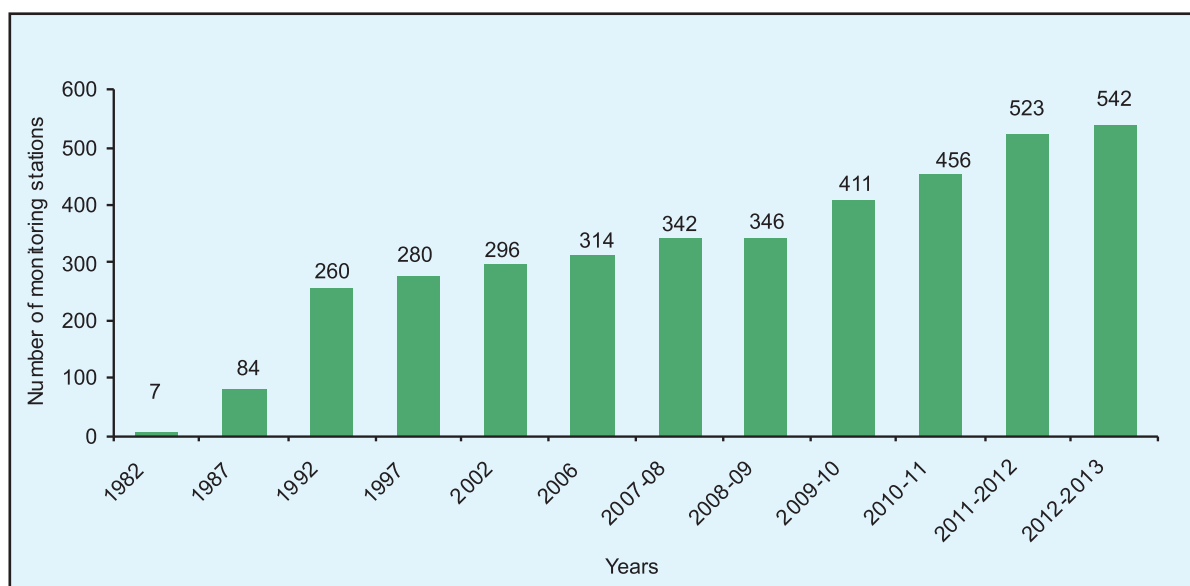


Fig-28. Growth of operating ambient air quality monitoring stations under NAMP in India (till 1st January 2013)

National Ambient Air Quality Monitoring Programme

Central Pollution Control Board is executing a nation-wide National Air Quality Monitoring Programme (NAMP). The N.A.M.P. was started in 1984 with 7 stations in Agra and Anpara. The growth of operating Ambient Air Quality Monitoring Stations in the country is given in figure below. The ambient air quality monitoring network has 542 operating stations covering 223 cities/towns in 26 States and 5 Union Territories as on 1st January 2013.

Parameters monitored under NAMP

Under NAMP three criteria pollutants viz. PM_{10} (Particulate Matter having an aerodynamic diameter less than or equal to $10\ \mu m$), Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2) were identified for regular monitoring at all locations. Other notified parameters like Carbon monoxide (CO), Ammonia (NH_3), Ozone (O_3), $PM_{2.5}$ (Particulate Matter having an aerodynamic diameter less than or equal to $2.5\ \mu m$), Benzo(a)pyrene {B(a)P}, Lead (Pb) and (Ni) are being monitored at selected locations.

The monitoring of meteorological parameters such as wind speed, wind direction, relative humidity and temperature has been also integrated with the monitoring of air quality.

Table-33. Number of metropolitan cities exceeding the NAAQS
(Based on annual average data 2011)

Category	Metropolitan cities (population > 10 lacs)		
	SO_2	NO_2	PM_{10}
Not exceeding NAAQS	49	41	7
Exceeding NAAQS	0	8	42
Total cities considered	49	49	49

Table-33 reveals that out of the 53 metropolitan cities 8 (16%) and 42 (86%) cities exceed the NAAQS with respect to NO_2 and PM_{10} . None of the cities exceed the standard limit with respect to SO_2 . The National Air Quality Monitoring Programme (NAMP) Network at a glance (as on 1st January 2013) is given below:

Table-34. National Air Monitoring Programme (NAMP) Network at a glance
(as on 1st January 2013)

A. Total no. of ambient air quality station sanctioned	700
No. of state/UT covered	28 States & 7 UTs
No. of cities covered under National Network (NAMP)	300
1. Total no. of operating stations	542
i) No. of State/UT covered	26 states, 5 UT
ii) No. of cities covered	223
iii) No. of stations in Sensitive Areas other than Ecologically sensitive area notified by GOI	14
2. No. of stations to be operationalized	158
i) No. of state/UT covered	22 states, 4UT
ii) No. of cities covered	95
3. Target on XIth five year plan	700 (Achieved)
B. Status of Air Quality in India	
Total Scenario in India	542 operating ambient air quality stations
Total Number of criteria/regular parameters monitored for ambient air quality	03 - SO ₂ , NO ₂ & PM ₁₀ (Sulphur Dioxide, Nitrogen Dioxide & Particulate Matter e _g 10 micron size)
Other notified parameters monitored in selected cities/locations	PAH (BaP), CO, O ₃ , NH ₃ , PM _{2.5} , C ₆ H ₆ , Pb, Ni, As
Percentage & Number of cities exceeds the permissible limit w.r.t. PM ₁₀ and NO ₂ (2010)	62% - PM ₁₀ – 131 cities 12% - NO ₂ – 19 cities
Total no. of Metro cities	53–Major/Metropolitan cities as per new census 2011
Total no. of operating stations in metro cities	200
Status of Air Quality in Major/Metropolitan Cities	53 metro cities data upto 2011
- Total Number of Major/Metropolitan cities as per new census of India 2011	Out of 53 cities, 49 cities having operational ambient air quality monitoring stations
Percentage & Number of major cities exceeds the permissible limit w.r.t. PM ₁₀ and NO ₂ , 2011	16% - NO ₂ – 08 cities, out of 49 cities 86 % - PM ₁₀ – 42 cities, out of 49 cities
C. Non Attainment/Non complied Cities	
1. Total non-attainment cities	
i) No. of cities in 2005	72 (23 States)
ii) No. of cities in 2012 (Tentative list declared) on the basis of 2008-2010 AAQ data (latest, as per revised standard)	95 (23 States)
D. Parameters monitored (104 observation/year)	
i) Criteria pollutants	SO ₂ , NO ₂ , PM ₁₀
ii). Additional parameters monitored at selected locations	PAH, H ₂ S, Toxic trace metals, NH ₃ – Hyderabad, Delhi, Mumbai, Nagpur, Chennai, Kolkata CO, Ozone, PM _{2.5} , C ₆ H ₆ – Delhi

E. Strengthening of Ambient Air Quality Stations (The Network - NAMP)	
Strengthening of AAQMS in 2010 -2011	143 Ambient Air Quality Stations
Strengthening of AAQMS in 2011-2012	35 Ambient Air Quality Stations
F. Roadmap to achieve target	
i) 2011-2012 New proposed stations for 3 Parameters (SO ₂ , NO ₂ , PM10)	35 stations (Achieved)
ii) 2012-2013 New proposed stations for 12 Parameters (SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , Ni, As, Pb, NH ₃ , B(a)P)	20 stations
iii) 2013-2014 New proposed stations for 12 Parameters (SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , Ni, As, Pb, NH ₃ , B(a)P)	20 stations

Urban Pollution Control Division:

Vehicular Pollution Control Measures

Air Pollution generated by human activities has adversely affected human population itself and has caused great economic damage to ecosystems and society. Urban air pollution is a major problem across the country. Rural to urban migration, growth in mobility demands, demands for power and industrial production has led to deterioration of air quality in urban areas. Vehicular sector is assumed to be one of the major source of air pollution in the urban areas and government has taken several measure to control pollution from vehicular sources.

Automobile Pollution Control initiatives taken recently includes enforcement of a variety of control measures ranging from notification of advanced Euro-IV equivalent emission norms and commensurate fuel for new vehicles to stricter exhaust emission limits for in-use vehicles, augmentation of infrastructures for alternative fuels and mass transits and other urban planning and management options. Important measures pertaining to vehicular pollution control initiated recently are as follows:

Vehicle Registration details

- Registered motor vehicles in India- **142 million vehicles** (2011-12).

- Registered motor vehicles in Delhi **7.5 million vehicles** (2011-12)
- The share of different categories of vehicles in total vehicle population is as below:

S. No	Vehicle type	Share (%)
1	Two Wheelers	72%
2	Cars & Jeeps	14%
3	Buses (including omni buses)	1%
4	Good Vehicles	5%
5	Other vehicles	8%

Mass Emission Standards

The Ministry of Road Transport and Highways (MoRTH) acts as a nodal agency for the formulation and implementation of various provisions of the Motor Vehicle Act and Central Motor Vehicle Rules (CMVR).

- Mass Emission Standards (Bharat Stage IV) have been implemented for all categories of new vehicles (except two and three wheelers) in 13 mega cities namely Delhi (NCR), Mumbai, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, Pune, Surat, Kanpur, Agra, Lucknow and Sholapur from the year 2010.
- Emission norms for new four wheelers have also been implemented in 7 more cities namely Puducherry, Vapi, Mathura, Jamnagar, Ankeleshwar, Hissar, Bharatpur

- from March 2012. Further as per Ministry of Petroleum & Natural Gas, 50 cities will be made BS-IV compliant by 2015
- Mass Emission Standards (Bharat Stage III) have been implemented for all categories of new four wheelers all over the country, from 1st October 2010.
 - Mass Emission Standards (Bharat Stage III) have been implemented for two and three wheelers all over the country, from 1st October, 2010.
 - Mass Emission Standards (Bharat (Trem) Stage III) have been implemented for every diesel driven agricultural tractors, from the 1st April, 2010 for the category < 37KW and from 1st April, 2011 for the category >37 KW.
 - Bharat Stage III (CEV) emission norms have been implemented for construction equipment vehicles since April 1, 2011. These emission norms are based on the engine power the construction equipment i.e Non-road vehicles.
 - Bharat Stage-III mass emission norms have been notified for gasoline driven power trillers manufactured on and from July 1, 2013.
 - Alternate Mass emission standards (BS-III) for 2 W gasoline with engine capacity exceeding 50 CC or a maximum design speed exceeding 50 km/hr based on Worldwide Harmonised Motorcycle Emission Certification (WMTC) implemented from May 9, 2011

Fuel Quality Specifications

- Auto-Fuels commensurate to B.S III (whole country) and B.S IV (for 20 cities) specifications has been made available in the respective cities as per the road map of Auto Fuel Policy

- The Research Octane Number (RON) for premium gasoline available in 20 cities has been boosted to 95 with lead content being reduced to 0.005 g/l and benzene content of maximum 1%. The content of sulphur in gasoline is reduced to 0.005% (50 mg/kg) from existing 0.015% (150 mg/kg) in BS-IV compliant 20 cities. However, all over the country, content of sulphur in gasoline is 0.015% (150 mg/kg).
- Gasoline commensurate with the applicable emission norms (give below) were made available in the mega cities and entire country

	20 cities (BS-IV Compliant)	Entire Country
Octane Number	91*	91*
Lead	0.005g/l	0.005g/l
Sulphur	50ppm	150 ppm
Bezene	1%	1%

- For diesel the Cetane Number has been enhanced to 51 with Sulphur content reduced further to 0.005 % (50 mg/kg) in BS-IV compliant 20 cities by. The amount of sulphur in diesel has been reduced to 0.035% (350 mg/kg) all over the country
- Diesel commensurate with the applicable emission norms (give below) were made available in the mega cities and entire country

	20 cities (BS-IV Compliant)	Entire Country
Cetane Number	51*	51*
Sulphur	50 ppm	350ppm
Poly Aromatic Hydrocarbons	11% mass	11% mass
Distillation 95% vol. Recovery at °C, max	360°C	360°C

* - for regular quality

In-Use Vehicles

- New PUC norms have been notified for both gasoline and diesel B.S-IV vehicles; wherein besides idle emission limits for gasoline vehicles, high idle emission limits have also been done and will be implemented from February 2013.
- MoRTH (Ministry of Road Transport & Highways in collaboration with ARAI has proposed to develop model I&C (Inspection & Certification) centres in all the states and the said model will further be replicated by all state governments in their respective states.
- The proposal for setting up modern I&C centres for ten states viz. Andhra Pradesh, Karnataka, Haryana, Himachal, NCT of Delhi, Maharashtra, Madhya Pradesh, Uttar Pradesh, Gujarat, Rajasthan has already been approved by MoRTH.

Alternate Fuels - Initiatives

There has been lot of developments on this front when various organizations including the Planning Commission, Oil Companies, Auto Sectors, CPCB and other research agencies initiated various demonstration and feasibility studies with alternative fuels like LPG and bio-diesel (B20) in the country. Some of the developments are mentioned below:

- Presently Compressed Natural Gas (CNG) vehicles have been plying in around 70 cities of the country. More than 11 lakh CNG vehicles have been plying all over the country and this is around 8% of national vehicle fleet.
- In Delhi more than 5.5 lakh CNG vehicles have been plying. Further Delhi has world's largest public transport system that runs on CNG
- Government has established Auto Liquefied Petroleum Gas (LPG) Dispensing stations

(ALDS) in 232 cities/towns of the country by 2012.

- In December 2009, Govt. Adpted National Bio-Fuel Policy, which requires blending of 20% bio-ethanol in gasoline and 20% bio-diesel in diesel by the year 2017.
- Bio-fuels mainly Ethanol and Biodiesel (in B20 form) are the prospective options for India. Pilot studies on ethanol and biodiesel have been completed and many are on-going.
- Efforts for developing and popularizing electric vehicles also gained momentum during this year. Already "Reva Motors" have commercialized a small electric/battery car. Many three-wheeler manufacturers are also contemplating electric driven OEM for Indian markets.
- The Ministry of Petroleum & Natural Gas has set up a Hydrogen Corpus Fund with a corpus of ₹100 crore with contribution from five major Oil Companies and Oil Industry Development Board (OIDB) for supporting Research and Development in various aspects of hydrogen, which could substitute part of natural gas as transport fuel in future.
- R&D has taken several steps for promoting Hydrogen as auto fuel with the help of Hydrogen Corpus Fund: Like A Hydrogen-CNG dispensing station has been set up in R&D Centre at Faridabad to cater the re-fueling needs of test/demo vehicles operating on H2- CNG blends.
- IOC (R&D and Mahindra & Mahindra have agree to jointly develop Fuel Cell Vehicles. In this regard a joint proposal on "Development of Fuel Cell Vehicles" has been submitted to Scientific Advisory Committee of MoPNG for funding from Hydrogen Corpus Fund.

Other Measures

- In Delhi BRTS has been implemented at various corridors since 2008.
- Road-infrastructure development, management and by-passing of interstate vehicles, parking restrictions, etc. are other measures being adopted in various cities.
- The Delhi metro line has been extended to various stretches of Delhi for catering more people thereby promoting use of mass public transport system. Other cities are also exploring to start metros and other mass transport systems.
- Interstate trucks which are not destined to Delhi are not allowed to ply within the city limits.
- Delhi Monorail system has been proposed and will be implemented shortly in a phased manner

Projects/Studies undertaken by CPCB

Studies/Projects related to Vehicular Pollution Control & Air Quality Management undertaken by Central Pollution Control Board are as follows:

- **Assessment of vehicular pollution problems and development of air quality management plan in religious & tourist places**

A study on "Assessment of vehicular pollution problems and development of air quality management plan in religious (Haridwar) & tourist (Mussorie) places" was taken up in collaboration with Pollution Control Research Institute (PCRI), Bharat Heavy Electrical Ltd. (BHEL), Haridwar. The study has been completed and has also covered Kumbh Mela held in Haridwar during Jan-April 2010. The study report is under publication.

- **Performance Auditing of Environment Management in Indian Railways stations, Trains and Tracks"**

Present study was done in-house by CPCB, Delhi in collaboration with its Zonal Offices. CPCB received a letter from Principal Director of Audits, Indian Railways, wherein it asked CPCB to carry out performance audit of various environment management steps taken by Indian Railways for controlling pollution. This study covered monitoring and evaluation of measures taken by the Railways for controlling pollution of air, water and noise in station premises /sidings/sheds. Six ZO's of CPCB were asked to carry out study in the Railway Zones coming under their jurisdiction. The final report of this study has been sent to Indian Railways

- **Assessment of Aldehydes, Ketones and Methane emissions in Vehicle exhaust, using different fuels (Petrol, Diesel, LPG, CNG, Ethanol in Petrol, Biodiesel and Hythane)"**

This study was awarded to International Centre for Automotive Technology (iCAT), Manesar with the objective to characterize Aldehydes, Ketones and Methane emissions in vehicle exhaust of 2-wheelers, 3-wheelers, 4-wheeled passenger vehicles, 4-wheeled Light duty commercial vehicles and 4-wheeled Heavy duty commercial vehicle engines operating on different fuels i.e. Petrol, Diesel, LPG, CNG, Ethanol (5%) in Petrol (BS III) and Biodiesel (10%) in Diesel (BS III) & Hythane. Phase-I of project has been completed while phase-II of the project i.e. assessment of carbonyl and methane emissions from OEM CNG vehicles has also been completed and its report is under finalization. The report of the both the

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phases will be published after completion of phase-II of the study.

– **Development of Comprehensive Industry Document (COINDS) for Automobile Manufacturing Industries**

This study has been awarded to TERI. The objectives of this study includes Inventorisation of Automobile manufacturing industries, process details of automobile manufacturing industry covering all categories of vehicles, identification of different sources of pollution for the automobile manufacturing industry, Characterization of liquid effluent, gaseous emissions and hazardous wastes storage and disposal methods, resource recycling and waste minimization practice, identification of technologies appropriate for the control of water pollution, air pollution and fugitive emissions under Indian conditions and development of environmental standards for the automobile industry.

– **Inventorization of Railway sidings and Guidelines for their Environmental Management.**

The study on Inventorization of Railway sidings and development of guidelines for their environmental management has been taken up by CPCB subsequent to a large number of public complaints related to railway sidings. This study has been awarded to RITES Limited, Gurgaon. The Objectives of the study involves Inventory of all major railway siding (Railway yards, ports, mines etc.), and development of guidelines for Environmental Management of Railway sidings.

– **Status of the pollution generated from road transport sector in 6 cities**

This study has been awarded to TERI

during the year 2011. The study involves Development of emission inventory of vehicular sources in six mega cities namely Hyderabad, Kolkata, Ahmadabad, Patna, Lucknow & Sholapur during first phase, Estimation of total vehicular emission loads (both tail pipe as well as evaporative emissions) in the selected cities/towns and estimation of contribution of different categories (2 wheelers, 3-wheelers & 4 wheelers like cars, LCV, HCV, etc.) of vehicles towards total vehicular emission load and identification of vehicle category contributing most towards total emission load from vehicles. More cities are likely to be covered in the next phase.

– **Development of guidelines for the Environmentally sound Recycling / disposal of ELVs (End of Life Vehicles)**

This is an In-house study aimed at developing guidelines for environmentally sound of ELV's through Inventorization and Categorization of different End of Life vehicles, details on various materials used in manufacturing of vehicles, LCA (Life Cycle Assessment) of different components of vehicles, estimation of generation of waste in terms of tons/annum from yearly and development of guidelines for recycling/disposal of used vehicles

– **Auditing of Pollution Under Control (PUC) Centers in various cities/ towns**

Auditing of PUC centers in the cities of Kolkata, Chennai, Jaipur, Hyderabad etc has been taken up during last year with the objective of knowing whether adequate testing facilities with respect to new norms have been procured by all the PUC centers and also to cross check procedure and protocols followed while vehicle testing. Further this shall also help

us identify any scope for false passes, if present in the new system. The scope of the study also include checking if the testing instruments have been certified by approving agencies and further to know the status of compliance of the vehicles with PUC norms.

– **Action plan for Controlling Air Pollution in Polluted cities**

At present CPCB is reviewing action plans of only seven cities out of the sixteen cities identified by the Hon'ble Supreme Court of India (Out of 16 cities, 7 cities namely Agra, Varanasi, Jharia, Patna, Jodhpur, Faridabad & Pune are looked after by CPCB, while other 7 namely Lucknow, Kanpur, Sholapur, Hyderabad, Chennai, Bengaluru, Ahmedabad are looked after by EPCA and remaining 2 i.e. Kolkata and Mumbai are reviewed by the respective High Court of these cities).

Review & Implementation of action plans received from various non attainment cities identified by the Honb'le Supreme Court of India as well as CPCB itself.

Committees in which CPCB is a member related to vehicular pollution control

- Standing committee on emission legislation (SCOE) constituted by MoRTH.
- Task Force for "Introducing auditing of PUC centers"constituted by MoRTH.
- Petroleum products sectioned committee constituted by BIS.
- Working group on adulteration of petroleum products constituted by Bureau of Indian Standards (BIS).
- Environmental Pollution Control Authority for NCR.
- The expert committee on Auto fuel Policy constituted by MoPNG.

- Review of Auto Fuel Policy,
- R&D Expert Committee of IOCL, Faridabad,
- Central Road Research Institute (CRRI) and Indian Road Congress Expert Committee,
- Working Group constituted by Department of Heavy Industries under Source Apportionment Studies,
- National Natural Resource Management System (NNRMS) Standing Committee on Urban Management.
- Working Group to deal with old vehicles – Retrofitment of pollution control devices, Scrap policy, Inspection & Maintenance issues.

Real Time Ambient Noise Levels in 7 Metro Cities during Deepawali 2011 and 2012

Real Time Continuous Ambient Noise Monitoring was conducted at 35 locations in seven cities (Delhi, Mumbai, Chennai, Kolkata, Lucknow, Bengaluru and Hyderabad) on the occasion of Deepawali 13.11.2012 and 26.10.2011 and data is presented in Table-35.

In comparison to sound level during Deepawali-2011, it has been observed that sound level in 04 cities (Bengaluru, Delhi, Kolkata and Hyderabad) shows decreasing trend whereas no change in sound level is observed in Mumbai. However, sound level at Lucknow and Chennai shows slight variation in comparison to Deepawali-2011.

Common Effluent Treatment Plants

The concept of Common Effluent Treatment Plant (CETP) was developed as a way to achieve end-of-pipe treatment of combined wastewater at lower unit cost than could be achieved by individual Small Scale Industry (SSI) units. MoEF introduced

Table-35. Real Time Ambient Noise Levels in Metro Cities during Deepawali 2011 and 2012

S. No.	City	Stations	2011Leq (24 hrs)	2012Leq (24hrs)
1.	Bengaluru	Nisarga Bhawan	60	51
2.		Parisar Bhwan	64	62
3.		BTM	65	63
4.		Marathalli	57	55
5.		Pinya	59	57
6.	Chennai	Triplicane	69	63
7.		T. Nagar	69	70
8.		Guindy	75	74
9.		Perambur	75	86
10.		Eye Hospital	65	60
11.	Delhi	NSIT	64	56
12.		CPCB	61	58
13.		DCE	53	50
14.		Dilshad Garden	57	49
15.		ITO (Pragati Maidan)	74	74
16.	Hyderabad	Abits	71	70
17.		Jeedimetla	61	61
18.		Jubilee Hills	-	54
19.		Punjagutta	75	76
20.		Zoo	-	52
21.	Kolkata	Head Quarter (WBPCB)	60	59
22.		New Market (Municipal Corporation)	64	64
23.		Patauli	57	54
24.		SSKM Hospital	59	59
25.		Golpark	64	64
26.	Lucknow	Indira Nagar	54	51
27.		PGI Hospital	-	54
28.		Gomti Nagar	-	60
29.		Hajrat Ganj	68	69
30.		Talkatora Industrial Area	59	61
31.	Mumbai	Acworth Hospital (ASHP)	64	64
32.		Bandra	69	69
33.		Thane (TMCO)	62	59
34.		Vashi Hospital	66	65
35.		MPCB, HQ	64	66

Note:-All values are measured in Leq [dB(A)]

Table-36. State-wise distribution of CETPs and their hydraulic capacities

State	Total installed CETPs	Functional CETPs	Installed but non functional CETPs	CETPs in State as % of total CETPs in country	State wise combined treatment capacity of CETPs, mld	Combined treatment capacity in State as % of total capacity in country
AP	4	3	1	2.6	13.5	1.1
Delhi	13	13	-	8.5	211.8	17.8
Gujarat	261	26	-	17	374	31.4
Haryana	9	9	-	5.9	48.3	4.1
Karnataka	7	7	-	4.6	7	0.6
Maharashtra	252	22	3	16.3	186.9	15.7
MP	1	1	-	0.7	0.9	0.1
Punjab	5	5	-	3.3	6.9	0.6
Rajasthan	11	10	1	7.2	117.2	9.8
Tamil Nadu	44	42	2	28.8	148	12.4
UP	7	4	3	4.7	56.3	4.7
West Bengal	1	1	-	0.7	20	1.7
Total	153	143	10		1191	

¹Two CETPs contribute to a final CETP (FETP), ²One CETP contributes to another CETP

a financial support scheme (CETP Scheme) since 1991 to promote establishment of CETPs through financial assistance in the form of 50% subsidy on capital (25% central subsidy plus matching 25% state subsidy). This subsidy has been increased from 50% to 75% (50% central subsidy plus matching 25% state subsidy) since 2012. Largely due to the support provided by the Central Government, 153 CETPs having combined capacity of about 1190 MLD covering about 15000 polluting industries have been established in the country.

CETPs installed in Andhra Pradesh, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal generally cater to wastewater of specific sectors – pharmaceutical, tanneries, Textile or electroplating sectors, whereas majority of CETPs in Gujarat and Maharashtra cater to

effluent from mixed type of industries with high or very high pollution potential and majority of CETPs in Delhi, Haryana, and Karnataka cater to mixed type of industries with low or moderate pollution potential.

CPCB has analyzed the standards compliance performance of CETPs on the basis of four year data in respect of:

General parameters (BOD, COD, TSS, NH₃-N and O&G)

- Out of 134 CETPs for which general parameters results were available and analyzed, 20 CETPs have implemented Zero Liquid Discharge systems, 43 CETPs are complying standards and 10 CETPs are nearly complying standards. Thus, 73 CETPs out of 134 i.e. 55% are able to comply or nearly comply with the standards.

- 61 CETPs i.e. 45% are not complying with the standards, with COD exceeding the standards by a factor <2 in 20 cases and by a factor >2 in 41 cases.

TDS parameter

- Out of 122 CETPs for which TDS results were available and analyzed, 20 CETPs having very high TDS in influent have implemented Zero Liquid Discharge systems, 9 CETPs having very high or high TDS in influent discharge their effluent into sea and 19 CETPs are complying TDS standards. Thus 48 CETPs out of 122 i.e. 39% are able to comply TDS standard.
- 74 CETPs i.e. 61% are still not able to comply TDS standards, of which final effluents of 16 CETP, i.e. 13% of 122, contain high TDS (exceeding standards by a factor <2) and of 58 CETPs i.e. 48% of 122, contain very high TDS (exceeding standards by a factor >2).

Actions for Improving Performance

CPCB has been regularly interacting with SPCBs in order to improve compliance of the prescribed standards by CETPs. SPCBs are required to fully address the issues related to performance of CETPs and strengthen the system of monitoring and follow up action to address the important issues:

- Prescribing and enforcing standards for effluent discharged from industries to match the inlet quality parameters of the CETP.
- Investigating TDS related problems, prescribing location specific regulations for control of TDS, preferably at source, and compelling the industries/CETPs for its solution.
- Regular monitoring of CETPs performance and taking effective follow up action to

change the status of non-complying CETPs and ensuring regular compliance.

- Regular monitoring and follow up action to stop bypass of untreated industrial effluents.

Implementation of Corporate Responsibility for Environment Protection (CREP):

Iron & Steel Sector

Revision and Harmonization of Environmental Standards for Integrated Iron & Steel Plants

The standards pertaining to various process units of Integrated Iron & Steel Plants were notified separately at different serial numbers under Environment Protection Rules. In order to bring more clarity and easy referencing, the standards were harmonized and brought together. Besides, environmental standards for Blast Furnace and Steel Melting Shop were also developed. The revised harmonized standards were notified vide G.S.R. 277 (E) dated March 31, 2012.

National Task force for Iron & Steel sector

National Task Force (NTF) for Integrated Iron & Steel Industries was constituted in the year 2003 for monitoring implementation of action points identified under CREP. NTF had been meeting regularly. During 2012 – 2013, the meeting of NTF was held on December 14, 2012. Various issues related to compliance to environmental norms and actions required for improving the environmental performance of the sector were discussed and finalized.

Environmental Quality Monitoring in Critically Polluted Areas:

Co-processing of wastes in cement kiln

Keeping in view the problems associated with the disposal of waste, CPCB initiated the concept of “Co-processing of waste in cement

kiln". The co-processing of waste in cement kiln has emerged as the best environment friendly option for its disposal, as it reduces carbon foot print besides conservation of fossil fuel and raw material.

Provision has been made under Rule 11 of the Hazardous Wastes (Management and Handling & Transboundary Movement) Rules, 2008 wherein CPCB has been empowered to issue permissions for utilization of hazardous waste for resource recovery or energy recovery.

CPCB received various applications under Rule 11 of the Hazardous Wastes (Management and Handling & Transboundary Movement) Rules, 2008 from cement plants for granting permission for co-processing of different kind of wastes in cement kiln. Various trial runs were conducted during 2012-2013 and based on satisfactory performance of trial runs, cement manufacturing units have been granted permission for co-processing of following categories of wastes.

- Organic plating sludge & dyeing sludge (Metal zippers Manufacturing Industry)
- Grinding waste, oil soaked cloth & ETP sludge (M/s Gillete India Ltd., Bhiwadi)
- Benzofuran (Kumar Organic Product Ltd)
- Chemical ETP sludge (M/s Syngenta India Limited, Goa)
- Waste mix liquid (M/s Bharuch Enviro Infrastructure Ltd., Ankleshwar, Gujarat)
- Spent carbon
- Solid waste mix (Shivalik Solid Waste Management Ltd., Nalagarh)
- PTA waste mix (M/s MCC PTA India Corporation Pvt. Ltd., West Bengal)
- CETP sludge of Jodhpur Pradushan Niwaran Trust

- Organic Residue
- Spent clay
- CETP sludge (Pali)
- ETP Sludge (Textile industry)

Hazardous Waste management

Utilization of hazardous Waste as Supplementary Fuel/Recourse Recovery

CPCB has permitted utilization of hazardous waste under Rule-11 of HWM Rules, 2008 after conducting trial utilization studies through its zonal offices. Permission were granted for utilization of hazardous waste like Ethylene glycol residue, Carbon slurry, High Boiler residue, ETP Sludge, Resin waste, spent chromic acid, spent acid containing molybdenum compound, spent anode butt, Sulphur Sludge, Spent catalyst-containing precious metals and waste pickling acid. So far, 20 proposals for such utilization of hazardous waste have been permitted.

Details of Treatment, Storage & Disposal Facilities (TSDFs) and their availability in different States is given in Table-37.

NCEF Project on Remediation of Hazardous Waste Contaminated Dump Sites

The Inter-Ministerial Group (IMG) of the Ministry of Finance has approved the MoEF proposal for remediation of 12 hazardous waste contaminated areas (containing multiple sites) at an initial project outlay of ` 805 crores. The funding under NCEF is limited to 40% of the total project cost. The remaining 60% to be borne by the State Governments through polluter pays/PPP/States share etc. CPCB has been identified as project executing agency

Six SPCBs have agreed in-principle for 60% funding from their states covering 10 contaminated areas out of the 12 initially proposed. This includes 18 sites in spread

4

Table-37. State-wise Availability of Common Integrated Treatment, Storage and Disposal Facilities (TSDFs), Exclusive Common Incinerators and Secured Landfills

S. No.	Name of the State/UT	Integrated TSDFs	Exclusive Common Incinerators	Exclusive Common Secured Landfills
1.	Andaman & Nicobar Islands	-	-	-
2.	Andhra Pradesh	2	-	-
3.	Arunachal Pradesh	-	-	-
4.	Assam	-	-	-
5.	Bihar	-	-	-
6.	Chandigarh	-	-	-
7.	Chhattisgarh	-	-	-
8.	Daman, Diu, Dadra & Nagar Haveli	-	-	1
9.	Delhi	-	-	-
10.	Goa	-	-	-
11.	Gujarat	3+ 1#	1	4
12.	Haryana	1 *	-	-
13.	Himachal Pradesh	-	-	1
14.	Jammu & Kashmir	-	-	-
15.	Jharkhand	-	-	-
16.	Karnataka	-	3	1
17.	Kerala	-	-	1
18.	Lakshdweep	-	-	-
19.	Madhya Pradesh	1 *	-	-
20.	Maharashtra	2+1#	-	1
21.	Manipur	-	-	-
22.	Meghalaya	-	-	-
23.	Mizoram	-	-	-
24.	Nagaland	-	-	-
25.	Odisha	-	-	1
26.	Puducherry	-	-	-
27.	Punjab	-	-	1
28.	Rajasthan	-	1	2
29.	Sikkim	-	-	-
30.	Tamilnadu	1	-	-
31.	Tripura	-	-	-
32.	Uttar Pradesh	1+ 1*	1	1
33.	Uttarakhand	1	-	-
34.	West Bengal	1	-	-
	TOTAL	16	6	14

* Incinerator installed and the same is under commissioning.

Operation of incinerator is under suspension.

Table-38. List of sites taken for study under the NCEF Project

S. No.	State	Name of the Area	No. of Sites	Nature of Contaminant
1.	Kerala	Eloor-Edayar, Cochin	1	Heavy metal and POPs
2.	Madhya Pradesh	Ratlam	4	Gypsum, iron salts and Naphthalene
3.	Odisha	Ganjam	3	Mercury
4.	Odisha	Talcher	1	Chromium
5.	Odisha	Sundergarh	4	Chromium
6.	Tamil Nadu	Ranipet	1	Chromium
7.	Uttar Pradesh	Rakhimandi, Kanpur	1	Chromium
8.	Uttar Pradesh	Rania, Kanpur Dehat	1	Chromium
9.	Uttar Pradesh	Lucknow	1	HCH (hexa chloro cyclo hexane)
10.	West Bengal	Nibra Village, Howrah	1	Chromium

across 10 contaminated areas of 6 States. SPCBs of Gujarat and Rajasthan have opted out of the NCEF funded project. The list of sites taken for study under the NCEF project is given in Table-38.

CPCB has issued Eols inviting competent consultants

Bio-medical Waste Management

The annual report information received for the year 2010 from the SPCBs and PCCs indicates that out of 1.39 lakh health care facilities (HCFs), 77,537 have obtained authorization. The existing scenario of bio-medical waste management with respect to the number of health care facilities, number of Common Bio-medical Waste Treatment Facilities, status of authorizations, total quantum of bio-medical waste generated and treated per day, type of treatment facilities etc. are as follows:

No. of healthcare facilities	139594
No. of beds	1420563
No. of Common Bio-medical Waste Treatment Facilities (CBWTFs)	188 + 17*
No. of healthcare facilities (HCFs) using CBWTFs	98764
No. of HCFs having treatment & disposal facilities	20228
No. of healthcare facilities applied for authorization	77537
No. of healthcare facilities granted authorization	70800

Total no. of on-site treatment equipment installed (at Healthcare facilities):

No. of incinerators	
i) With Air Pollution Control Device	419
ii) Without Air Pollution Control Device	273
No. of autoclaves	2710
No. of microwaves	179
No. of Hydroclave	13
No. of Shredders	4250

Total no. of treatment equipments installed at CBWTFs:

No. of incinerators	177
No. of autoclaves	161
No. of microwaves	10
No. of Hydroclave	5
No. of Shredders	170
Quantity of bio-medical waste generated in Tons/day	355
Quantity of bio-medical waste treated in Tons /day	302.0
No. of HCFs violated BMW Rules	6653
No. of Show-cause notices/Directions issued to defaulter HCFs	5829

Note: * - CBWTFs under installation

There has been increase in number of common Bio-medical waste treatment facilities over the years and at present there are 205 CBWTFs (188 under operation + 17 under construction) so as to facilitate proper treatment and disposal of bio-medical waste in the Country.

Directions under Section 5 of the Environment (Protection) Act, 1986 and Verification of compliance of Directions issued under Section 5 of the Environment (Protection) Act, 1986

Central Pollution Control Board is regularly monitoring CBWTFs/HCFs to improve compliance of CPCB's Direction under Section 5 of the Environment (Protection) Act, 1986 are being issued to defaulter HCFs/CBWTFs.

Evaluation of new State of Art treatment technologies for safe disposal of bio-medical waste

CPCB has re-constituted an Expert Committee on bio-medical waste management with the members from organizations such as MoEF, National Productivity Council (NPC), DHS, All India Institute of Medical Sciences (AIIMS) &

Toxic Link -an NGO etc. under the Chairmanship of Dr.T.K.Joshi, Director, Deptt. of Occupational Environment & Health, Maulana Azad Medical College, New Delhi for the purpose of evaluation of state-of the art technologies for treatment of bio-medical waste and to suggest suitable standards for any such technologies.

The following technologies have been permitted provisionally by CPCB;

- The 'Plasma Pyrolysis Technology' proposed by the Facilitation Centre for Institute of Plasma Technology (FCIPT), Gujarat have been granted provisional approval for treatment of bio-medical waste categories (1), (2), (5) & (6) stipulated under Bio-medical Waste (BMW) Rules as per recommendations of the members of Expert Committee on Bio-medical Waste Management
- Sharp Blaster (Needle Blaster) System for treatment of bio-medical waste category no. 04 (i.e sharp waste sharps)
- 'PIWS 3000 (Static/Mobile)' based on shredding & chemical disinfection proposed by M/s Trade International, New Delhi.

Organization/sponsoring of programme on Bio-medical Waste Management

Central Pollution Control Board initiated a programme called 'Paryavaran Darshan' in collaboration with 'Doordarshan' to create awareness and to disseminate the information on various issues pertaining to environmental management including the steps to be taken for ensuring compliance to the provisions of the Bio-medical Waste (Management and Handling) Rules, 1998 and amendments thereof. The 'documentary film' prepared covering the aspect of segregation, packaging, transportation, storage, treatment and disposal

etc. and the said documentary have been telecasted on Doordarshan Channel under 'Paryavaran Darshan' programme on March 26, 2011 & August 13, 2011.

Interaction Meet with CBWTFs

Central Pollution Control Board, organized interaction meets with operators of Common Bio-medical Waste Treatment Facilities (CBWTFs) and officials of State Pollution Control Boards (SPCBs) / Pollution Control Committee (PCCs) to discuss State specific issues and for ensuring effective implementation of Bio-medical Waste (Management & Handling) Rules, 1998 as well as CPCB's guidelines for CBWTFs.

Guidelines for Environmentally Sound Management of Mercury Waste Generated in Health Care Facilities

CPCB has prepared a document on "Environmentally Sound Management of Mercury Waste Generated in Health Care Facilities" for effective management of mercury spills in Health Care facilities.

Batteries Rules

As per the Batteries (Management & Handling) Rules-2001 as Amended on May 2010, CPCB was given the responsibility of registering the importers of New Lead Acid Batteries w.e.f. May, 2010 (the same registrations were issued by MoEF prior to amendment notification S.O 1002 (E), dated 4th May, 2010).

CPCB has been processing the applications for registering the importers having IEC certificates. The numbers of registrations/

enlistments of importers as on January, 2013 is given in Table-39.

In order to bring transparency in public domain and also to increase the efficiency in the process of grant of registration, CPCB has initiated a project for development of web based Battery (Importers) Registration Management System (BRMS) wherein the applicants desirous of seeking registration can apply online, view the status of their application, give the undertaking prior to import and also submit half yearly returns on the same platform. This application would help SPCBs and customs authorities in tracking the status of compliance of each registered importer.

It is expected that the system will be operation by 1st week of March, 2013.

E-Waste Management

CPCB in association with MoEF has published guidelines for implementation of the provisions of the E-Waste (Management & Handling) Rules, 2011 to help the stakeholders, i.e. the Producers, Consumer, Bulk Consumer, Collection Center, Dismantler, Recycler and Regulatory agencies (SPCBs/PCCs) for effective compliance/implementation of these rules. This document also provides guidance on setting up collection mechanism, dismantling and recycling operations. The scope of implementing such EPRs is also discussed in these guidelines.

E-waste recycling based on environmentally sound recycling principles is permitted under The Hazardous Waste

Table-39. Numbers of registrations/enlistments of importers as on January, 2013

Registration Granted by	2010-11	2011- 12	2012-13
MoEF	1009 (till May 2010)	NA	NA
CPCB	234 (from May 2010)	235	155

(Management, Handling & Transboundary Movement) Rules, 2008. MoEF and CPCB have brought out guidelines for environmentally sound management (ESM) of e-waste. The guidelines were notified by MoEF in March 2008. The guidelines provide comprehensive framework for e-waste collection, transportation, recycling and disposal.

As an outcome of this regulatory intervention, at present there are seventy seven (77) e-waste recycling facilities were granted registration by CPCB/SPCBs in 9 States in the country with a total recycling capacity of about 2.4 lakh MTA. The Statewise distribution of E-Waste recycling facilities is given in Table-40.

Table-40. State-wise distribution of E-Waste recycling facilities

S. No.	State	Registered Units	Capacity in MTA
1.	Andhra Pradesh	2	11800
2.	Gujarat	1	12000
3.	Haryana	4	6100
4.	Karnataka	39	32382
5.	Maharashtra	7	10050
6.	Rajasthan	2	2250
7.	TN	19	154436
8.	Uttrakhand	1	12000
9.	UP	2	2500

Municipal Solid Waste (MSW) Management

The Ministry and Central Pollution Control Board (CPCB) have been assessing regularly the implementation status of the Municipal Solid Waste (Management and Handling) Rules, 2000 through Annual Reports from the SPCBs/PCCs. The 'Consolidated Annual Review Report' has been forwarded with certain recommendations for enhancing implementation of the said rules. MoEF and CPCB have also undertaken 10 projects through SPCBs/PCCs to demonstrate

implementation of the MSW Rules, 2000. Phase-I of such projects have been completed in Mandi (Himachal Pradesh) and Agartala (Tripura). The projects at Chandigarh and North Dum Dum are in the final stage of completion with waste processing and landfill facilities.

For compliance of the MSW Rules, CPCB has sponsored schemes for monitoring of groundwater and ambient air qualities in MSW locations in the state of Andhra Pradesh, Assam, Meghalaya and Himachal Pradesh through the concerned State Boards. Also, CPCB has sponsored study to State Remote Sensing Agencies for identification of Common/Regional landfill sites for integrated management of municipal solid wastes in the state of Andhra Pradesh, Karnataka and NCR-Delhi, which have been completed.

In-Situ Treatment of Sewage

The wastewater management is an important aspect of water pollution. Class-I and Class-II towns in the country generates 38,254 MLD of sewage; of which treatment facility available is for only 11,787 MLD (31%). The central Pollution Control Board has taken initiative to bridge the gap by implementing 'In-situ Treatment of Sewage' through bioremediation and application of microbial consortia. The technology is able to reduce pollution load in terms of BOD, COD and Suspended solids up to 80% and heavy metal and other pollutants up to 50%. Such study has been completed in Ramnagar Domora drain, Bharatpur (Rajasthan) and AB Road Drain, Indore (Madhya Pradesh). Presently, the scheme under NRCD/NGRBA is on-going at Budha Nala- Ludhiana (Punjab) and Bakarganj Nala- Patna (Bihar). The project sites at Tokaghat Nala –Farukhabad (UP) and Mowaiya Nala- Allahabad (UP) and Chinsura Nala (WB) are under consideration under NGRBA.

Development of Environmental Standards

Development/revision of emission standards for cement sector

Cement industry is one of the major air polluting industry sector under 17 categories of industries in the country. During the various operations of cement manufacturing, substantial quantum of dust is emitted, if air pollution control device is not operating efficiently. Cement manufacturing also emits SO₂ and NO_x emissions. The emission standards for particulate matter were notified in April 1987 which was amended in February 2006.

However, there is no emission standard for SO₂ and NO_x emission. Considering the above, a study on "Development / revision of emission standards for cement plants" was undertaken in association with National Council for Cement and Building Materials, Ballabgarh. Considering the NO_x, SO₂, PM emission level and load based PM emission data vis-à-vis control technology available, prevailing emission standards in other countries & keeping in mind the observations of the Parliamentary Standing Committee, following emission standards were agreed by the Peer & Core Expert Committee of CPCB and also approved in Board meeting.

Table-41. Emission Standards for Rotary Kiln based Cement Industries

NO _x	New Plants (commissioned on or after date of notification)	600 mg/Nm ³ (at 10% O ₂)
	Existing plants (commissioned before the date of notification) (these standards are to be implemented from the date of notification until 31.7.2015)	1000 mg/Nm ³ ** (at 10% O ₂)
	Existing plants (commissioned before the date of notification) (these standards will be implemented w.e.f. 1.8.2015)	800 mg/Nm ³ (at 10% O ₂)
SO ₂	For cement plants having sulphur content in raw meal less than or equal to 0.5 %	100 mg/Nm ³ (at 10% O ₂)
	For cement plants having sulphur content in raw meal more than 0.5 %	1000 mg/Nm ³ (at 10% O ₂)
load based PM for raw mill, kiln & precalciner system together	Plants commissioned on or after 3.2.2006 (corresponding to 50 mg/Nm ³)	0.125 Kg/tonne of clinker
	Plants commissioned before 3.2.2006 (corresponding to 100 mg/Nm ³)	0.25 Kg/tonne of clinker***
	Plants commissioned before 3.2.2006 (corresponding to 150 mg/Nm ³)	0.375 Kg/tonne of clinker***
	Existing Standards:	
	Plants commissioned on or after 3.2.2006	50 mg/Nm ³
	Plants located in urban area or critically polluted area & commissioned before 3.2.2006	100 mg/Nm ³ *
	Plants located in other area & commissioned before 3.2.2006	150 mg/Nm ³ *
	Proposed Standards:	
	Plants commissioned before 3.2.2006 (these standards will be implemented w.e.f. 1.8.2014)	50 mg/Nm ³

*w.e.f. 01.08.2014, applicable emission standards will be 50 mg/Nm³

** w.e.f. 01.08.2015, applicable emission standards will be 800 mg/Nm³.

***w.e.f. 01.08.2014, applicable emission standards will be 0.125 Kg/tonne of clinker

NOTE: In case of Grinding/Blending units, only concentration based PM standards will be applicable)

Table-42. Emission Standards for VSK based cement Industries

PM	Existing Standards:
	400 mg/Nm ³
	Proposed Standards (w.e.f 1.8.2013)
	150 mg/Nm ³
NO _x	500 mg/Nm ³ (at 10% O ₂)
SO ₂	200 mg/Nm ³ (at 10% O ₂)

Development and Promotion of Clean Technology

- Project on 'Development of National Database on Cleaner Technologies (CT) for financial appraisal of CT based projects and application of fiscal measures for promotion of CT in India' was sponsored by MoEF in September, 2009
 - Reconstitution of the CTAC in the 5th meeting of CTAC held at MoEF. The project review presented the new 'CLUSTER' approach for the identified four sectors viz., Used/Waste Oil Reprocessors, Textiles, Tanneries and Dyes & Dye Intermediates with a request for way forward.
 - Field visits to the four identified sectors viz., Used/Waste Oil Reprocessors, Textiles, Tanneries and Dyes & Dye Intermediates in Uttar Pradesh & Punjab & Haryana.
 - Four Sectoral Reports were prepared on Clean Technology Options in Used/Waste Oil Reprocessors, Textiles, Tanneries and Dyes & Dye Intermediates.
 - A Technical Paper on 'Spent Oil Recycling and its Recycling Potential in India – Inventory and Issues' was accepted at International Symposium on Environmental Science and Technology, Dalian, Liaoning Province, China to be held on June 4-7, 2013 and will be published in *Procedia Environmental Sciences* by Elsevier.
- Follow up for next meeting with MoEF for further guidance & request for Project extension.
- Coordination Cell of CPCB prepared a proposal to MoEF to organize a National Conference on Persistent Organic Pollutants.
- Areas of Collaboration with Government of Finland were identified in the field of Odour Measurements, Fugitive Emissions, and Spontaneous Stack Monitoring. The projects were launched in Nov, 2011.
 - First National Workshop was conducted in Delhi in 8-9th Feb, 2012 to introduce the project goals to the SPCBs / PCCs
 - Two Regional Workshops were conducted on Odour Measurements and Source emission measurements at Vadodara (7-8 Feb 2012) and Chennai (22-24 Aug 2012).
- Development of Implementation strategy for Hg management in Fluorescent Lamp Sector
 - Two Regional Workshops were conducted on 'Sustainable Management of Mercury in Fluorescent Lamps in India' at Chennai (Oct 11-12, 2012) and Delhi (Dec 13-14, 2012).
- Biomimetic Sequestration of CO₂ into Calcium Carbonate using immobilized Enzyme and Whole Cell Bioreactor – Information collected on the status of the similar activities initiated by SPCBs/PCCs.
- Contributed to the working Group on Single Window Clearance Mechanism for SPCB/PCCs.

Market Friendly Emissions Trading Scheme (ETS) for Particulate Matter in Stationary Sources

The Pilot Project for Emission Trading Scheme for Particulate Matter has been initiated by Ministry of Environment and Forests (Govt. of India) initially in three States i.e. Gujarat, Maharashtra and Tamil Nadu. Central Pollution Control Board, State Pollution Control Boards (SPCBs) of Gujarat, Maharashtra and Tamil Nadu are the main stakeholders of this project.

The project is envisaged to progress in three phases with Phase I involving designing of ETS project and preparation of various documentation and protocols including field trials of real time continuous emissions monitoring system, Phase II involving Baseline Survey of industries including development of CARE centre infrastructure in SPCBs as well as CPCB and Phase III is the implementation of pilot emission trading regime and associated evaluation (Table-43).

The Design Phase is funded under IDF grant (World Bank) and MoEF awarded this project at a total cost of ₹ 1,23,66,213/- (Rupees One Crore Twenty Three Lakh Sixty Six Thousand

Two Hundred Thirteen only) inclusive of all taxes in the year 2011 with the objective to improve the Air Quality in India. The Baseline Survey is the complement of design phase and also a part of the activities envisaged in a larger goal of design, implementation and evaluation of Continuous Emission Monitoring and Pilot Emission Trading Scheme for Particulate Matter from stationary sources in India. This project is funded by MoEF under Water Cess fund to CPCB in the year 2012 with a total cost of ₹3.97 Crores (₹ Three Crores Ninety Seven Lakh only). The Baseline Survey would represent the first major data step towards completion of the project and anticipated to lead directly to a number of outputs including:

- A first of its kind assessment of abatement cost curves for industry.
- A market simulation model estimating impacts of trading programmes.
- A model estimating costs to industry from tightening existing standards.
- A database of installed air pollution control equipment, operating condition and particulate levels from selected industries for pilot study,

Table-43. Key objectives of Pilot Project for Emission Trading Scheme (ETS)

Project Phase Number	Name	Key Objectives
I	Design Phase	Dialogue and concurrence Initial Concept Note and Evaluation Design Draft Continuous Emissions Monitoring Systems and Data Acquisition and Handling Guidelines Selection of pilot project areas and industry based on available data and objective selection criteria Field Trials of Continuous Emissions Monitoring Systems (CEMS)
II	Baseline Survey	Baseline survey of industries Analysis of data to estimate abatement costs, project benefits, health impacts, status of industry etc CARE Center infrastructure in SPCBs CEMS installation and evaluation (CARE Center used to receive continuous emissions data from regulated industries)
III	Implementation Phase	Training and capacity building, SPCBs Regulatory notification enabling trading on pilot basis Concurrent evaluation and documentation

For the implementation phase, a Draft Project Report (DPR) has been prepared by DPR Drafting Committee (comprising of representatives of participating SPCBs, CPCB, MoEF & JPAL) and submitted to MoEF for approval and fund provision. The implementation phase comprises training and capacity building, regulatory notification for enabling pilot ETS and its evaluation and documentation.

Implementation of the 'Charter for Water Recycling and Pollution Prevention in Pulp and Paper Industries in Ganga River Basin'—regarding

Central Pollution Control Board (CPCB) has evolved a 'Charter for water recycling and pollution prevention in pulp & paper industry in Ganga River basin'. The Charter takes a holistic approach for pollution prevention in Pulp & Paper industries by emphasising on process technology up-gradation and adoption of best practices, besides quantum improvement in effluent treatment including tertiary treatment to reduce fresh water requirement, improve effluent quality and optimise water recycling. There is no compromise with regard to the industry meeting the prescribed effluent standards. Compliance with the prescribed standards is mandatory.

Extensive consultations were held beginning in April 2012 with various stake holders viz. Central Pulp & Paper Research Institute (CPPRI), Saharanpur, Department of Paper Technology, IIT, Roorkee, Uttarakhand Environment Protection and Pollution Control Board (UEPPCB), Uttar Pradesh Pollution Control Board (UPPCB), and Industry Associations, namely Indian Agro & Recycled Paper Mills Association (IARPMA), Paper Unit Chapter of Kumaun Garhwal Chamber of Commerce and Industry (KGCCI) and Paper

Manufacturer Association (PMA), Uttar Pradesh and culminating in June 2012 with a detail implementation programme of about eight months duration for implementation of the Charter in five identified clusters of Pulp & Paper industries located in the catchments of Ramganga and Kali rivers.

The implementation programme was also discussed on 29th June, 2012 in CPCB with the Mission Director (NMCG), Ministry of Environment & Forests (MoEF), Joint Secretary (CP Division), MoEF, Director, CPPRI, Member Secretaries of UEPPCB and UPPCB and Pulp & Paper Mills Associations representing the identified clusters.

The detailed implementation programme prescribes stringent fresh water consumption norms for various categories of Pulp & Paper industries, with improved effluent quality. The expected effluent quality after addition of tertiary treatment could be BOD < 10 mg/l and SS < 5 mg/l, equivalent to the process water quality, which will ultimately lead to recycling and reuse of treated effluent, thus reducing the fresh water requirement and subsequent effluent generation.

The 'Charter for Water Recycling and Pollution Prevention in Pulp and Paper Industries in Ganga River Basin' is under implementation by 84 Pulp & Paper industries located in five identified clusters namely Kashipur and Roorkee in Uttarakhand and Muzaffarnagar, Meerut and Moradabad in Uttar Pradesh since August 2012. The duration of the implementation programme is up to March 31, 2013.

Main highlights

- Water consumption is expected to be reduced by 40%.
- Agro based Pulp & Paper industries will stop chemical pulping till commissioning

- of chemical recovery plants (CRPs) to stop discharge of black liquor.
 - Many common CRPs/ individual CRPs are planned to be installed under the programme, which will address colour problem in river water.
 - Provisions have been made for strict metering of the water use and wastewater generation.
 - Self monitoring and reporting by individual industry
 - Third party monitoring & assessment through CPPRI & local Paper Mills Associations besides surprise monitoring by CPCB/ SPCBs.
 - Up gradation of 85 Pulp & Paper Units located in the five identified clusters within the short period of about eight months.
 - Quantum improvement in effluent quality after commissioning of tertiary treatment with BOD < 10 mg/l & SS < 5 mg/l.
 - Stringent treated effluent norms with BOD < 30mg/l (against the prescribed norms of 30 mg/l) and SS-75 mg/l (against the prescribed norms of 100 mg/l). Additional norms have been introduced for the treated effluent quality with COD-250 mg/l (for agro based) & 225 mg/l (for RCF based), TDS-2100 mg/l and Colour-500 PCU (for agro based) & 250 PCU (for RCF based).
 - Up-gradation & augmentation of ETP system upto tertiary level (against the mandatory secondary treatment level).
- Some of the achievements of the implementation programme till December 31, 2012 are as under:

Expected Output

- Reduced fresh water consumption for various categories of Pulp & paper industries:
 - From 100 cum/MT to 60 Cum/MT in case of agro based writing & printing category (against the effluent discharge standards of 150 cum/MT),
 - From 75 cum/MT to 40 Cum/MT in case of agro based kraft category (against the effluent discharge standards of 150 cum/MT),
 - From 50 cum/MT to 20 Cum/MT in case of RCF based writing & printing category (against the effluent discharge standards of 50 cum/MT),
 - From 35 cum/MT to 10 Cum/MT in case of RCF based kraft category (against the effluent discharge standards of 50 cum/MT).

- Individual ETP adequacy reports have been prepared for all the 84 participating Pulp & Paper industries and these reports have been assessed by CPPRI through an expert committee.

Water Conservation

- Almost all the mills have installed flow meters on their bore wells for monitoring of water consumption.
- All 84 participating mills have started proper maintenance of log books for fresh water consumption, effluent generation and effluent discharge quality.
- Almost all the mills have installed showers of specified diameter to reduce water consumption on paper machine
- Most of the mills have almost achieved fresh water consumption targets as indicated in the Charter.
- The mills which have completed the ETP upgradation have also achieved the

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stipulated discharge norms with respect to waste water discharge as well as quality.

- Two industries in Kashipur and one industry in Moradabad have reported to have achieved zero discharge.

Process Up-gradation

- Two agro based mills in Kashipur have adopted oxygen delignification system, one of which has even introduced partial replacement of chlorine with chlorine dioxide.
- While in Kashipur four agro based mills already chemical recovery Plant (CRP), the erection of CRP is under progress in one mill in Kashipur. In Muzaffarnagar, one agro based mill is having CRP, four common CRPs are under construction.
- All the mills have installed fiber recovery system like dissolved air floatation, sedicell, etc to recover fiber as well increase reuse of back water.

ETP Up-gradation

- The upgradation work related to ETP has been accomplished by the most of the mills in Kashipur and Meerut, while it is under progress / nearing completion in mills located in Muzaffarnagar.
- Pulp & Paper industries located in Moradabad and Roorkee have started their activities under the Charter late and are under the initial phase.
- Diffused aeration system has been installed and commissioned in most of the mills in Kashipur and Merut and the MLSS level are between 1500- 3000 mg/l
- Almost all the mills have created facility for analysis of waste water , completed colour coding of pipe lines and created EM Cell.
- The major reason for delay in ETP

upgradation in some of the clusters is due to delay in supply of blowers / diffused aerators by the supplier.

Tertiary Treatment

- While some have already adopted tertiary treatment system (Pressure Sand Filter, Dual Media Filter , Micron Filter, Clarifloculator etc), others are in process of erection / commissioning .
- The mills have installed or are in process to install screw press, belt press etc for efficient black liquor extraction / pulp washing.

Monitoring

- Several rounds of monitoring for compliance verification have been carried out by CPPRI and local industry associations. CPCB has also carried out monitoring of about 50% of the participating industries till December 31, 2012.

Guidelines for Slaughter Houses

As per the decision taken in the meeting of the Committee held on 26.04.2012 at MoEF, New Delhi under the Chairmanship of the Secretary, Environment & Forests, CPCB issued directions under section 18(1)(b) of the Water Act, 1974 to 23 State Pollution Control Boards /Pollution Control Committees on 12.07.2012. As per the said directions, the State Boards/ Committees have been asked to ensure following actions:-

- The State Boards/Committees shall ensure that all slaughter houses operate with valid consent;
- The State Boards/Committees shall take appropriate action so that the slaughter houses provide effluent treatment facility to meet norms;

- The State Boards/Committee shall take action against defaulting slaughter houses; and
- The State Board/Committee shall submit six-monthly status reports to CPCB indicating no. of slaughter houses in operation, no. of slaughter houses with effluent treatment facility, number of slaughter houses with valid consent and actions taken against the defaulting slaughter houses.

The Hon'ble Court while hearing the matter on 23.08.2012 directed CPCB to write to all the state governments informing about the guidelines for slaughter houses as well as to initiate action against all slaughter houses which are not meeting the norms and implement the abattoir rules through State Pollution Control Board (SPCB). In compliance of the Hon'ble Court's said order, CPCB issued letter dated 05.09.2012 to all the State Boards/Committees to take action against the slaughter houses not meeting with the norms and abattoir rules and also circulated copies of its two publications namely, "Comprehensive Industry Document on Slaughter Houses, Meat and Sea Food Processing" and "Solid Waste Management in Slaughter House". Further, CPCB filled affidavit dated 17.09.2012

The Hon'ble Court on 10.10.2012 directed that CPCB, Animal Welfare Board and the MoEF to work out a board framework so that the Committees can effectively implement the provisions of the Act regarding transportation of live stocks, slaughter and disposal of waste etc. In compliance of the Hon'ble Supreme Court's order dated 10.10.2012, the broad framework under the Environment (Protection) Act, 1986 and the Rules framed thereunder, was prepared.

The state-wise status based on replies received from SPCBs/PCCs is given in Table-44.

Eight states namely, Karnataka, Maharashtra, Manipur, Meghalaya, Odisha, U.P., Uttarakhand and UT of Puducherry informed that the State Committee has been constituted. Replies have also been received from other 11 SPCBs/PCCs of Andhra Pradesh, Himachal Pradesh, Goa, Gujarat, Kerala, Punjab, Chandigarh, Delhi, Madhya Pradesh, Hayrana and Chhattisgarh. Tripura State Pollution Control Board informed that there is no slaughter house. Reminders have been issued to remaining 20 SPCBs/PCCs to forward status.

Parliament Matter

CPCB has taken up the matter with the U.P. Pollution Control Board for implementation of the recommendation made by the Committee on Petitions (15th Lok Sabha) in their 10th report. The slaughter house (Kamela) at Hapur Road run by Meerut Nagar Nigam has been dismantled on May 2, 2012. There is no slaughter house now at the site.

Environmental Information Management System

Real Time Pollution Monitoring Network at Central Pollution Control Board:

A system for collecting online data on real time basis and publishing from 35 (Thirty five) continuous ambient air quality monitoring stations operated by various agencies like CPCB, SPCB and industries is in operation. During the current year, the concept of networking of different instruments in use for continuous air/water/noise quality monitoring through-out the country by different agencies was introduced. CPCB is receiving data from more than 170 stations in different formats and efforts are being made to bring all the data on

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Table-44. State-wise status based on information received from State Pollution Control Boards/Pollution Control Committees regarding Slaughter Houses

S. No.	State/ UT	Constitution of Committee	Other information
1	Andhra Pradesh	-	93 slaughter houses in State. Of these, 73 slaughter house are in operation
2	Arunachal Pradesh		
3	Assam		
4	Bihar		
5	Chhattisgarh		6 Slaughter Houses in State
6	Goa	-	One slaughter house in State
7	Gujarat	-	19 Slaughter Houses in State
8	Haryana		41 Slaughters Houses in State Slaughter House not in operation = 10
9	Himachal Pradesh	-	13 slaughter houses in State
10	Jammu & Kashmir		
11	Jharkhand		
12	Karnataka	Constituted	-
13	Kerala		The State Board informed that Status is under preparation
14	Madhya Pradesh		28 Slaughters Houses in State
15	Maharashtra	Constituted	-First meeting was held on 07.12.12- It was decided to compiling information from various departments.
16	Manipur	Constituted	-
17	Meghalaya	Constituted	-
18	Mizoram		
19	Nagaland		
20	Odisha	Constituted	-
21	Punjab		54 slaughter houses in State
22	Rajasthan		
23	Sikkim		
24	Tamil Nadu		
25	Tripura	-	No slaughter house in State
26	Uttar Pradesh	Constituted	-
27	Uttarakhand	Constituted	State Board issued necessary instructions to Regional offices.
28	West Bengal		
29	A & N Islands		
30	Chandigarh	-	One slaughter house.
31	Daman Diu Dadra Nagar Haveli		
32	Delhi	-	One slaughter house.
33	Lakshadweep		
34	Puducherry	Constituted	-

a single platform for easy understanding and analysis.

The concept was materialized with the installation of central software operated by the major suppliers of instruments through installation of their own hardware & software. Through these systems data collection is possible without human intervention and data analysis is made possible on real time basis. These portals are web based and uninterruptedly operational in separate specific domains through which online data can be analysed. The physical data submission will be discontinued in future and time gaps in data submission have been reduced significantly.

Strengthening of Network and Updation of CPCB Website: Efforts are made for uninterrupted LAN and Internet connectivity to CPCB officials of various divisions and strengthening the Computer Network at Parivesh Bhawan. Total computers on LAN with Internet connectivity are about 400.

CPCB's website is updated regularly and the users' response/access to this website has been very good. During the calendar year 2012, number of hits was more than 2.75 crore, out of which 94% hits were successful. On an average, more than 8,05,588 visits were made to the site and average duration of visit was more than 6 minutes. One third of the visits were made by the international users.

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 14th September 1999.
- Amended notification S.O. 979 (E) of 27th August 2003.
- Amended notification S.O. 2804 (E) of 3rd November 2009.

The objectives of these notifications are to protect environment, conserve the top soil and 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. A Monitoring Committee has been constituted by the Ministry with members from Ministry of Coal, Ministry of Powers, Central Pollution Control Board, Central Electricity Authority, Department of Science and Technology and Building Material Technology Promotion Council to monitor implementation of the provisions of the notification.

The utilisation of fly ash has been increased over the years because of various initiatives taken by Government for promoting gainful utilisation of fly ash in various construction activities. The fly ash utilisation during the year 2011-12 is reported to be 85.05 million tonnes whereas it was reported to be 6.64 million tonnes in the year 1996-97.

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

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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

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. In general, clean technologies are less intensive in use of raw materials and energy, than conventional technologies, which rely on pollution abatement after generation. They may also offer significant cost advantages to the producer. 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 on Development & Promotion of Clean Technology and Waste Minimisation Strategies the progress made are as follows:

- Four cleaner technologies has been developed by the Ministry in collaboration with the research institutions of the country during the current financial year.
- Eight meetings of the Progress Review Committee were organized on the site to monitor the progress of the projects.
- The two schemes on “Development & Promotion of Clean Technology and Industrial Pollution Abatement through Preventive Strategies (Waste Minimisation)” has been decided to merge into one scheme called Development & Promotion of Clean Technology and Waste Minimisation Strategies.
- EFC & Guidelines of the merged scheme “Development & Promotion of Clean Technology and Waste Minimisation Strategies” has been approved.
- The Scheme was widely publicized through national New Papers as well as website of the Ministry to obtain good project proposals on transparent manner.
- The Committee constituted by the Ministry has scrutinized the new proposals and sent for evaluation/examination to the experts. Meeting of Apex committee is likely to be convened soon.

Ongoing Projects: Under the grant-in-aid scheme on Development & Promotion of Clean Technology, twenty projects were continued during the period and their progress was monitored through Monitoring Committee, followed by workshops and field visits. These are:

- Development of Air Pollution Control Package for small Scale Lime Kilns by NEERI, Nagpur;
- Effective removal of arsenic from ground water covering Maslandapur – Ghoshpur blocks of 24 Parganas (N) (II-Phase) by ion – specific adsorbents carrying sorbed ferric hydroxide to CSMCRI, Bhavnagar, Gujarat
- Defluoridation of water using natural materials for better drinking water supply in rural regions by Jawaharlal Nehru University, New Delhi.
- Development of Fly Ash Based Geopolymer Concrete Pre-cast Elements by Annamalai University, Annamalai Nagar (Tamil Nadu)
- Life Cycle Assessment of Wood and Bamboo Composite Products by IPIRTI, Bengaluru
- Creation of database and evolving mechanism for capacity building in the financial section and application of fiscal instruments for clean technology project.
- Promotion of cleaner and Environmentally Friendlier Technology in the Highly Polluting Small – Scale Glass Industry Cluster at Firozabad by Winrock International India, Gurgaon, Haryana.
- Modification & Designing of Fly ash composites in Building Materials for energy Conservation & shielding Application by National Physical Laboratory, New Delhi.
- Eco Friendly Road Technology – RBI Grade 81 Natural Soil Stabilizer by M/s Alchemist Touchnology Limited, New Delhi.
- Waste Minimisation studies in Electroplating Industries in Balanagar Industrial area, Hyderabad – Proposal by Environment Protection Training and Research Institute (EPTRI), Hyderabad CPA.
- Waste Minimisation studies in Textile sector in Nandigaon village Kothur Mahboobnagar district, Andhra Pradesh by EPTRI, Hyderabad.
- Waste minimization in small scale Industries – WMC Extension –Phase-III proposed by NPC, New Delhi.
- Clean Technology for waste Minimization from Nutraceutical Industry, Yenepoya University, Mysore.
- Biological Liquefaction of Waste Fleshings and Treatment with Tannery Effluent for Biogas Generation in Single Reactor by Central Leather Research Institute, Chennai
- Evaluation of Refuse Derived Fuel from Waste Plastics as Engine Fuel Substitute by Annamalai University, Annamalai Nagar.
- Production of bioelectricity from sludge and domestic wastewater using microbial fuel cell University of Calcutta, Kolkata.
- Waste Minimisation through co-composting of on and off-farm wastes for sustainable crop productivity and soil health by Annamalai University, Annamalai Nagar.
- Waste Minimisation in Moradabad Brassware Cluster by The Energy Resource Institute, New Delhi.
- **Life Cycle Assessment** Life Cycle Assessment Studies in Thermal Power Plants, Steel, Pulp and Paper, Cement and Construction Studies has been completed while wood and Bamboo Composite Products are likely to be completed by end of 2013.
- **Organisation of Workshop:** One National level workshop was organised by the

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Ministry to disseminate the outcome of the project on Environmental Impacts of Slaughter House Wastes by Value Addition as Pet Foods at Aligarh Muslim University, Aligarh. Three awareness workshops were organised by the National Productivity Council, New Delhi at Bengaluru, Indore (MP) and Khurja (UP) on Waste Minimisation Strategies.

Details of the Completed Projects: Four cleaner technologies have been developed by the research institutions of the country during the current financial year. These are:

- Minimization of Environmental Impacts of Slaughter House Wastes by Value Addition as Pet Foods by Aligarh Muslim University, Aligarh.
- Pilot demonstration of Clean Technology for landfill gas (LFG) recovery at Okhla site, by TERI, New Delhi.
- Development of Fly Ash Based Geopolymer Concrete Precast Elements to Annamalai University, Annamalai Nagar, Tamil Nadu.
- Life Cycle Assessment for construction Industry – concrete by National Council for Cement and Building Materials (NCCBM), Haryana.

Hazardous Substances Management (HSM)

Introduction

The activities under the Scheme “Creation of Management Structure for Hazardous Substances Management” relate to planning and overseeing implementation of policies and programmes on management of chemical accidents and solid wastes so as to promote safe handling of hazardous chemicals and solid wastes viz-a-viz Hazardous Waste, Bio-Medical Waste, E-waste, Municipal Solid Waste

and Plastic Waste. The Scheme has following objectives:

- Creation of Hazardous Substances Management Structures in the States.
- Chemical Safety – Management of Chemical Accidents.
- Proper handling and disposal of Solid Wastes.

Progress/Achievements made during the year

National Inventory of Hazardous Wastes

As per the information of Central Pollution Control Board (CPCB), there are about 41,523 industries in the country generating about 7.90 million tonnes of hazardous waste every year, of which landfillable waste is 3.32 million tonnes (42.02%), incinerable waste is 0.60 million tonnes (7.60%) and recyclable hazardous waste is 3.98 million tonnes (50.38%).

The Ministry has initiated a project on Geographical Information System (GIS) based National Hazardous Waste Information System. It is a web based system, which has been developed to provide status of hazardous waste management in the country. The database available on the web is required to be regularly updated by all State Pollution Control Boards to ensure updated status at all times. As on date, the system has statewise information for about 25,000 hazardous waste generating industries.

Treatment, Storage and Disposal Facilities (TSDFs) for Hazardous Wastes

At present, Common TSDFs have been developed for the disposal of landfillable Hazardous Waste at 30 different places in 16 States namely, Andhra Pradesh (2), Daman, Diu, Dadra & Nagar Haveli (1), Gujarat (8), Haryana (1), Himachal Pradesh (1), Karnataka

(1), Kerala (1), Madhya Pradesh (1), Maharashtra (4) Odisha (1), Punjab (1), Rajasthan (2), Tamil Nadu (1), Uttar Pradesh (3), Uttarakhand (1) and West Bengal (1). Total waste disposal capacity (landfillable waste) of these facilities is 34.21 million tonnes. Out of these, 16 facilities in nine states have incinerators. In addition, six exclusive common incinerators have been installed. These TSDFs can cater to the need of 96% of landfillable Hazardous Waste. Six TSDFs are under construction. During the 11th Five Year Plan Period, financial assistance has been provided for setting up of eight TSDFs across the Country.

E-Waste Management

According to CPCB, the e-waste inventory in India for the year 2012 has been estimated to exceed 8.0 lakh tonnes. About sixty five cities in India generate more than 60% of the total e-waste and 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 top ten e-waste generating states in India. Among top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bengaluru, Chennai, Kolkata, Ahmadabad, Hyderabad, Pune, Surat and Nagpur.

The Ministry has notified E-waste (Management and Handling) Rules, 2011. These rules have come into force from 1st May, 2012. These rules apply to e-waste generated from IT and telecommunication equipment and consumer electrical and electronics namely 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 cost 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 substances (RoHS) to the prescribed limit within a period of two years from the date of commencement of these rules. These rules are the main instrument to ensure environmentally sound management of e-waste.

Chemical safety

The Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 and the Chemical Accidents (Emergency Planning, Preparedness and Response) (CAEPPR) Rules, 1996 are the main instruments for ensuring chemical safety in the Country. These rules delineate the criteria for identification of Major Accident Hazard (MAH) unit. As per the rules, Central Crisis Group, State Crisis Groups, District Crisis Groups and Local Crisis Groups at Central, State, District and Local level are required to be set up for the management of accidents due to handling of hazardous chemicals listed in the rules. The district having MAH units is required to have its off-site emergency plan so as to mitigate the impact of chemical accidents. As per the information received from the States, there are 1,905 MAH units in the Country, located in 304 districts.

A sub-scheme titled "Industrial Pocket wise Hazard Analysis" has been in operation since the Eighth Five Year Plan. During the last

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financial year, the Ministry provided financial assistance for preparation of off-site emergency plans, hazardous analysis and rapid safety audit reports for 41 districts having MAH units. Out of these, the off-site emergency plans including hazard analysis and rapid safety reports have been prepared during the year 2012-13. These plans are under review.

The financial assistance was provided to various consultants conducting training programmes on Management of Chemical Accidents. Three training programs on 'Prevention and Management of Chemical Accidents' under the scheme of 'Prevention and Management Structure for Hazardous Substances' has been conducted for 2012-2013.

India has a significant presence in the production of basic organic and inorganic chemicals, pesticides, paints, dyestuffs and intermediates, petrochemicals, fine and specialty chemicals, cosmetic and toiletry product segments. The chemical industries in the Country have entered into an era of growth and change. A need was felt to review the existing regulatory framework on chemical safety and, therefore, the Ministry initiated a review of the existing regulatory framework through consultation with stakeholders. A technical committee was constituted to review & harmonize the MSIHC rules and CAEPPR rules and first meeting of the committee was held in February, 2013.

The Ministry has developed the National Implementation Plan (NIP) under the Stockholm Convention on Persistent Organic Pollutants (POPs). As per the NIP, the Ministry is required to dispose off 7,700 tonnes of Poly Carbonated Bi-phenyl (PCB) and PCB contaminated waste by 2028. For the purpose, the Ministry is implementing the Post NIP project under the

Stockholm Convention. Under the project, the Ministry initiated the activities relating to establishment of facilities for treatment and final disposal of PCBs and PCB contaminated waste. The Steel Authority of India (SAIL) has agreed to install the proposed facility in the premises of Bhilai Steel Plant. The Central Power Research Institute (CPRI), Bengaluru has agreed to host a mobile PCGB treatment facility under the project.

The text of the Rotterdam Convention was adopted at the Diplomatic Conference held in Rotterdam on 10th September 1998 and entered into force on 24th February 2004. India acceded to the convention on 24th May 2005 and it became operative on 23rd August 2005. The objectives of the Convention are, to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.

The fifth Conference of Parties (COP) to the Rotterdam Convention in June 2011 applauded India for its spirit of consensus and support of listing of Chrysotile Asbestos. India as a follow up of the request of the Chair of the contact Group chaired an informal group to continue discussion with a view to possibly identifying ways to achieve consensus on listing. The dissident group did not agree to any consensus reiterating that Chrysotile Asbestos may be discussed in next meeting COP with more technical and scientific information. Department of Chemicals and Petrochemicals

(DCPC), Ministry of Chemicals and Fertilizers through National Institute of Occupational Health, Ahmadabad, has conducted a study on Health/Environment Hazards resulting from Use of Chrysotile variety of Asbestos. Ministry of Environment & Forests has evaluated the said Report and communicated the inputs to DCPC.

United Nations Environment Programme (UNEP) organised 5th Intergovernmental Negotiating Committee (INC-5) meeting for a Global Legally Binding Instrument on Mercury between 13 -18th January, 2013 at Geneva. India participated in the aforesaid negotiations through an Inter-Ministerial team. The principle of CBDR (Common But Differentiated Responsibility) was categorically reaffirmed as the foundation of International Cooperation on Environment and Development. Existing primary mining of Mercury from existing mines will continue for another 15 years. We stand benefitted from this provision because of our import dependency for Mercury.

The issue of emissions and releases of Mercury was of particular concern to India, given our dependence on coal based power generation. Our effective interventions and coalition building helped in protecting our interest in this area. The specific threshold levels for various identified sources were deleted from the draft text. For emissions from new sources, there is a period of 5 years after which parties have to apply Best Available Techniques (BAT). There are similar provisions for releases of Mercury in effluent in the proposed instrument. The proposed listing out of sources of releases in the instrument was deleted.

Plastic Waste (Management and Handling) Rules, 2011

New Plastic Waste (Management and Handling) Rules, 2011 have been notified

under the Environment (Protection) Act, 1986 in supersession of the Recycled Plastics Manufacture and Usage Rules, 1999 and 2003. In the new rules, the minimum thickness for manufacturing plastic carry bags has been increased from 20 micron to 40 micron. Use of plastic material in any form for packing gutkha, pan masala and tobacco in all forms has been banned. No carry bags shall be made available free of cost to consumers by retailers. The municipal authorities are required to determine the minimum price for plastic carry bags in order to encourage their re-use so as to minimize plastic waste generation. Municipal Authority has been made 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.

To create awareness on the various provisions of these rules, the Ministry provided financial assistance to State Pollution Control Boards (SPCBs) namely Assam, Nagaland, Sikkim and Madhya Pradesh for conducting training programs on plastic waste management. Further Training of Trainer (ToT) was also organized for various stakeholders.

Bio-Medical Waste Management

As per the information received from SPCBs and PCCs of Union Territories, there are 188 Common Bio-Medical Waste Treatment and Disposal Facilities (CBMWTDFs) in operation and 17 CBMWTDFs under installation. Besides, there are 688 incinerators, 2,710 autoclaves, 179 microwaves, 13 hydroclaves and 4,250 shredders as captive treatment equipments being operated by the individual health care facilities. To create awareness among the persons, who are involved in handling of biomedical waste, the Ministry provided

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support to some SPCBs for conducting training programmes on various aspect of Bio-medical waste management.

The Ministry notified the draft Bio-Medical Waste (Management & Handling) Rules, 2011 on 24th August, 2011 inviting comments/suggestions from the public. The comments/suggestions received in the Ministry were compiled and analyzed in consultation with various stakeholders such as Union Ministry of Health and Family Welfare, SPCBs/PCCs of Union Territories, representatives of health care establishments, operators of common biomedical waste treatment and storage facilitates and civil societies. The rules are being finalized and will be notified in supersession of the Bio-Medical Waste (Management & Handling) Rules, 1998 and the amendments made thereon. In the new rules, it has been proposed to cover all the health care establishments, including all veterinary institutions generating bio-medical waste for obtaining authorization from the Prescribed Authority. Presently, only those HCEs which provide health care services for 1,000 patients or more per month are required to obtain authorization from the Prescribed Authority, i.e. the SPCB.

The Ministry is implementing a UNDP project on "Demonstrating and Promoting Best Techniques and Practices for reducing Health Care Waste to avoid Environmental Releases of Dioxins and Mercury". Under the project, various activities relating to development of model systems for biomedical waste management, training to the persons involved in waste handling and for proper storage and transport of wastes from the point of generation to the point of treatment were undertaken in the states of Tamil Nadu and Uttar Pradesh.

Remediation of Contaminated Hazardous Waste Dump Sites

A project with the assistance of World Bank is being implemented by the Ministry to remediate ten highly polluted sites, two in Andhra Pradesh and eight in West Bengal on pilot basis. The total cost of the project is USD 75.39 million (₹ 339.26 crores approx.) for a period of five years.

The objective of the project is to develop a National Programme for rehabilitation of ten identified polluted sites in Andhra Pradesh (two sites) and West Bengal (eight sites) on pilot basis. Besides, the project will support the development of institutional and methodological framework for rehabilitation of highly polluted abandoned sites and build human and technical capacity in state agencies for undertaking projects on reduction of risk from contamination to nearby population. The project will also support measures from public awareness and community education. During the year 2012-13, three NPRPS (National Programme for Rehabilitation of Polluted Sites) consultancies were awarded and the work under all three consultancies is in progress. Inception reports have been received. Finalization of remediation plans of Noor Mahmood Kunta Hazardous Waste Sites and Closure for containment work for Kadapa Site in Andhra Pradesh are under consideration on the basis of reports received from consultants. Financial support of ₹ 18.84 crore (up to December, 2012) has been provided to State agencies concerned under the project.

This Ministry has also 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 done under the World Bank project.

Draft Bio-Medical Waste (Management & Handling) Rules, 2011

The Ministry notified the draft Bio-Medical Waste (Management & Handling) Rules, 2011 on 24th August, 2011 inviting comments/suggestions from the public. The Comments/suggestions received in the Ministry were compiled and analyzed in consultation with the stakeholders such as Ministry of Health and Family Welfare, SPCBs/ PCCs, representatives of health care establishments, operators of biomedical waste treatment and storage facilities, civil societies, etc. The rules are being finalized and will be notified in supersession of the Bio-Medical Waste (Management & Handling) Rules, 1998 and the amendments made thereon. The major changes proposed in the draft rules are:-

- Simplification of colour coding for segregation of waste at the source of generation of bio-medical waste.
- Mandatory 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.
- Constitution of district level committees for monitoring implementation of various provisions of these rules.
- Precautionary principles including safety of the workers handling bio-medical waste.
- 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 Labeling) Rules, 2011

The Ministry of Environment and Forests notified the draft Hazardous Substances (Classification, Packaging and Labeling) Rules, 2011 to regulate and ensure proper classification, packaging and labeling of hazardous substances. The draft Rules were published for public comments. The salient features of the draft Rules are given below:

- These rules shall apply to hazardous substances, hazardous chemicals and dangerous goods as specified in the list of chemicals.
- 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.
- Various classes of hazardous substances have been specified viz. explosives, gases, flammable liquids and flammable solids, oxidizing substances, toxic and infectious substances, radioactive materials, corrosive substances and miscellaneous substances.
- The assignment of United Nations number and proper shipping names have been prescribed as per its hazard classification and composition. Packaging provisions have been assigned for handling of

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hazardous substances. Labeling provisions, viz. trade name, substance name, chemical Abstract Number, gross weight name and address of manufacture, importer, supplier, emergency contact number, hazard class, packing group, play card, etc. have been provided.

The comments/ suggestions received on these rules were compiled and analyzed in consultation with the stakeholders. The comments in respect of responsibilities assigned to the Central Ministries concerned, Central/State Departments have been requested for finalization of the Rules.

Review of Legislation / Subordinate Legislations

During the year 2012-13, the Ministry has initiated the process of review of following legislations/subordinate legislations in consultation with the Stakeholders:

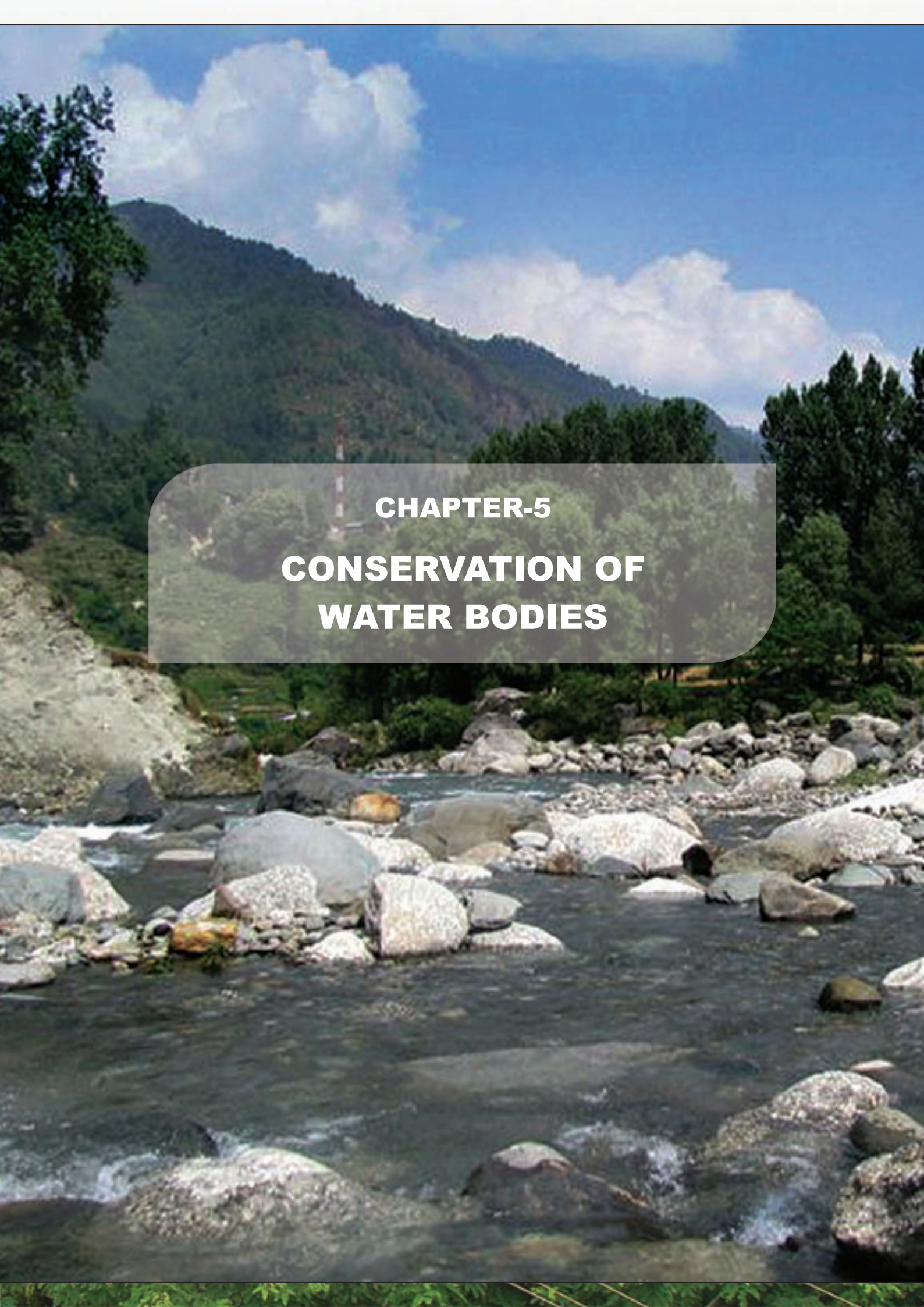
- The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and as amended.
- The Manufacture, Storage, and Import of Hazardous Chemical Rules 1989 and as amended.
- The Chemical Accidents (Emergency, Preparedness, Planning and Response Rules 1996.
- Notification (S.O. No. 227 dated 24.3.1992) delineating the scope of Public Liability Assurance Act, 1991.

Budget allocation and progress of Expenditure during 2012-13; XII Plan Outlay

The budget allocation and progress of expenditure during 2012-13 (up to 31st Dec., 2012) and proposed outlay of XII Plan are as under:-

(₹ in crore)

Year	BE	RE	Expenditure (as on 31.12.2012)
2012-13	39.85	27.35	19.99
XII Plan	186.00	Not applicable	Not applicable



CHAPTER-5
CONSERVATION OF
WATER BODIES

National River Conservation Directorate

The National River Conservation Directorate, 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 41 rivers have been covered under the programme (Table-45).

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 20.02.2009, under the chairmanship of the Prime Minister as an empowered planning, financing, monitoring and coordinating authority for the Ganga River, in exercise of the powers conferred under the Environment (Protection) Act, 1986.

In its first meeting on 5th October, 2009, the Authority decided that under *Mission Clean Ganga* it will be ensured that by 2020 no untreated municipal sewage and industrial

Table-45. Rivers covered under NRCP Programme

S. No	River	S. No	River	S. No	River	S. No.	River
1	Adyar	12	Ganga	23	Musi	34	Tapi
2	Beas	13	Godavari	24	Narmada	35	Tunga
3	Betwa	14	Gomati	25	Pennar	36	Tungabadra
4	Beehar	15	Khan	26	Pamba	37	Tamrabarani
5.	Bhadra	16	Krishna	27	Panchganga	38	Vaigai
6	Brahmani	17	Kshipra	28	Rani Chu	39	Vennar
7	Cauvery	18	Mahanadi	29	Ramganga	40	Wainganga
8	Cooum	19	Mandovi	30	Sabarmati	41	Yamuna
9	Chambal	20	Mandakini	31	Satluj		
10	Damodar	21	Mahananda	32	Subarnarekha		
11	Dhipu & Dhansiri	22	Mindhola	33	Tapti		

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 2nd Meeting of the NGRBA on 01.11.2010.

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 Indian Institute of Technology (IITs) (Kanpur, Delhi, Madras, Bombay, Kharagpur, Guwahati and Roorkee). In this regard, a Memorandum of Agreement (MoA) has been signed on 06.07.2010 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 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 river conservation schemes. Preparation of City Sanitation Plan is required. On that basis schemes will be selected for abatement of pollution. Prefeasibility report will also be prepared before preparing DPR. Operation and Maintenance (O&M) plan for first 5 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 Memorandum of Agreements (MoA) among Government of India, State Government and Urban Level 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 intuitions/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 ₹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 Jawaharlal Nehru National Urban Renewal Mission (JNNURM)/ Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) etc. 29 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 41 rivers spread over 20 states (Annexure-V). This includes works undertaken under GAP-II. The total cost of the sanctioned projects is about ₹ 8416.38 crore. An amount of ₹ 4032 crore has been released by the Government of India so far. 881 schemes have been completed as against 1152 sanctioned schemes. 5090 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 4704 mld of sewage has been created till the end of December, 2012 including 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.

Pollution Abatement of River Mindhola at Surat, Gujarat

Surat having a population of about 44 Lakh is located on the banks of two rivers namely, Tapi and Mindhola. Sewage is also reaching the sea through the creeks. In the catchment of river Tapi, at present about 100 MLD sewage is being generated against which STP capacity of 115 MLD is available. The State Government has posed a proposal of construction of 55 mld STP in this catchment to the Ministry of Urban Development under JNNURM recently. About 86 mld sewage is being generated in the catchment area of Tena creek, for which 115 mld sewage treatment capacity is available and one STP of 84 mld capacity is being constructed under JNNURM. This will take care of the pollution load in the Tena creek catchment area.

In the catchment area of Mindhola, total sewage generation is about 400 MLD. A treatment capacity of 427.50 has been created so far. At present, not all of the sewage is reaching the STPs due to some uncovered area by the sewerage system in the catchment area. Thus, about 250 MLD sewage is reaching the STPs, and balance 150 MLD is falling in the river Mindhola.

For conservation of river Mindhola at Surat, the State Govt. has submitted the project proposal costing ₹ 387.58 crore making provisions for sewerage networks, sewage pumping stations in three drainage districts along with creation of sewage treatment capacity of 53 mld for the conservation of river Mindhola along Surat within a period of 30 months.

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The project has been sanctioned at an estimated cost of ₹ 262.13 crore on 24.8.2012. Funds of ₹ 41.70 crore have been released to Surat Municipal Corporation, implementing agency for implementation of the project so far. Funds of ₹ 80 crore are likely to be released in the financial year 2013-14.

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 of Uttar Pradesh, Delhi & Haryana in April 1993 with a loan assistance from Japan Bank for International Cooperation (JBIC). This project has been completed at a total cost of ₹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 (in 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 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 India was signed on 31st March 2003. The project has been approved by CCEA at an estimated cost of ₹ 624 crore for abatement of pollution of river Yamuna in Delhi, UP (8 towns) and Haryana (6 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. ₹ 530 crore Central share and ₹ 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 ₹ 679.88 crore, out of which an amount of ₹ 426.32 crore has been released towards Central share. Under this plan, a sewage treatment capacity of 189 mld out of the envisaged capacity of 189 has been created.

YAP-II project also includes preparation of DPRs for projects in the 3 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	₹ 387.17 crore
UP	₹ 124.13 crore
Haryana	₹ 62.50 crore
Miscellaneous (WQM, Capacity building, Consultancy etc.)	₹ 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 ₹ 1656 crore. The project cost will be shared between the Government of India (Gol) and the Government of NCT of Delhi on 85:15 basis. The share of Gol will be ₹ 1407.6 crore and that of Government of NCT of Delhi will be ₹ 248.4 crore. JICA has agreed to provide a loan assistance of ₹ 32571 Million to Gol 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 7 years. Project Management Consultant will be appointed by DJB to assist in project implementation. The O&M of the assets created under the project will be the responsibility of the State Government/DJB. The project will be completed in 7 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 ₹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 ₹7000 crore has been approved for implementation. The Bank will support the Government of India by providing technical assistance and financing of US \$ 1 billion (approx. ₹4600 crore). The share of Government of India will be ₹5100 crore and

Table-46. Water quality data for River Ganga (Summer Average i.e. March-June)

S. No	Station/Location	Distance (KM)	DO (mg/l)		BOD (mg/l)	
			1986	2012	1986	2012
1.	Rishikesh	0	8.1	7.5	1.7	1.2
2.	Hardwar D/s	30	8.1	7.4	1.8	1.6
3.	Garhmukteshwar	175	7.8	7.4	2.2	1.7
4.	Kannauj U/S	430	7.2	6.8	5.5	3.9
5.	Kannauj D/S	433	NA	7.0	NA	4.4
6.	Kanpur U/S	530	7.2	7.2	7.2	3.9
7.	Kanpur D/S	548	6.7	6.1	8.6	4.5
8.	Allahabad U/S	733	6.4	7.8	11.4	6.4
9.	Allahabad D/S	743	6.6	7.4	15.5	3.6
10.	Varanasi U/S	908	5.6	8.2	10.1	2.6
11.	Varanasi D/S	916	5.9	7.5	10.6	3.4
12.	Patna U/S	1188	8.4	7.1	2.0	1.8
13.	Patna D/S	1198	8.1	6.9	2.2	2.2
14.	Rajmahal	1508	7.8	6.8	1.8	1.4
15.	Palta	2050	N/A	7.4	N/A	2.2
16.	Uleberia	2500	N/A	6.3	N/A	3.2

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 -

Pollution Control Research Institute (PCRI), Bharat Heavy Electricals Ltd. (BHEL), Hardwar (Rishikesh to Anoopshahr), (Badrinath to Hardwar)

Central Pollution Control Board (CPCB) (Allahabad to Tarighat)

Deptt. Of Zoology, Patna University (Buxar to Sahebganj in Bihar)

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)

that of the State Governments of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal will be ₹1900 crore. States have set up dedicated State Project Management Group (SPMG) 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, an investment of ₹26000 crore has been estimated as per approved NGRBA Annual Plan 2012-13 (State Perspective for 8 years).

Other initiatives: North East

Identification of polluted stretches of rivers and polluting towns in rest of the 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 Central Pollution Control Board (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, 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 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-46.

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 Sewage Treatment Plants (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 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), Tunga, Bhadra, 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



Fig-29. Phawngpui - The Blue Mountain of Mizoram

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 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 cost of ₹ 1031.14 crore (Annexure-III). Conservation works for 27 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 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 2012-13 under National River Conservation Plan and National Lake Conservation Plan is given in Table-47.

Names and addresses of implementing agencies

The names and addresses of State Implementing Agencies under NRCP is at **Annexure-V**

National Wetland Conservation Programme (NWCP)

Brief Objectives

The National Wetland Conservation 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 4th December, 2010. As per the provision under Rule 5 of these wetlands rules, Central Wetlands Regulatory Authority (CWRA) has

Table-47. Budget Allocation for 2012-13 under National River Conservation Plan and National Lake Conservation Plan

(₹ in Crore)

Sl. No	Name of the Plan	Budget Estimate	Revised Estimate	Expenditure by GOI (November 2012)
1	National River Conservation Directorate (NRCD)	7.05	7.05	4.30
2	National River Conservation Plan (NRCP)	187.25	168.25	157.14
3	National Ganga River Basin Authority (NGRBA)	512.50	193.50	4.53
3	National Lake Conservation Plan (NLCP)	52.50	52.50	52.30
	Total	759.30	421.30	218.27

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.

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.

Activities under MAPs of identified wetlands

Main Activities under MAPs of Wetlands for which funds are provided, include:

- Survey and demarcation, Catchment area treatment, Protection measures, Fisheries development, Weed control, Wildlife conservation, Pollution abatement,

Research on various aspects of Wetlands, Eco-development activities, Education and awareness, etc

To supplement the Management Action Plans, assistance is also given for research & developmental activities in various thrust areas of research which include:

- 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 (NWCP)

- During the year 2012-13, Management Action Plans of 36 wetlands were approved and financial assistance released to the concerned State Governments. So far, an amount of Rs 10.59 crores has been released (till 31.12.2012) against the total allocation of Rs 13.00 crores. Funds were also released for three ongoing research projects under the NWCP.
- One meeting of Central Wetlands Regulatory Authority (CWRA) held under the chairmanship of Secretary (E&F).
- One training workshop was to be held in Shillong for training of senior wetland managers dealing with wetlands in North-Eastern sector. This workshop has been postponed and will be organized after finalization of new dates.
- World Wetland Day- 2012 was organized at Thiruvananthapuram, Kerala where Chief Minister Kerala was the chief guest. This was followed up with technical workshop

on "Tourism and Wetlands" which was the theme for the year 2012 for Ramsar Convention on Wetlands.

- Under Prime Minister's Reconstruction Plan three wetlands were identified from Jammu & Kashmir and assistance for executing conservation activities in these wetlands was released to State Government in case of Tso Morari in Laddakh and Mansar-Surinsar in Jammu.
- Draft guidelines for notification of wetlands under the Wetland Rules -2010 were finalized in the meeting held on 03.09.2012 and will be distributed after its approval by the competent authority

International issues and Ramsar Convention

- 26 sites have already been designated as Ramsar sites in India till date. (Annexure-VI A). Six more wetlands are under process of being designated as Ramsar sites.

- India represented Wetlands International on the Board of Directors and was elected as member of Supervisory Council of Wetlands International twice which is a partner organization of the Ramsar Convention.
- India is also a partner to the Himalayan initiatives along with other Himalayan countries. Himalayan initiative was endorsed by the Indian Government in 2008.
- Indian delegation participated in Ramsar Convention COP11 meeting held at Bucharest, Romania from 6th to 13th July, 2012 and intervened in almost all 22 resolutions passed during the convention. India's views on monitoring of Ramsar sites, strategic plan 2009-2015, suggestions for partnerships and synergies with multilateral environmental agreements, their views on socio cultural issues,



Fig-30. Rivers Indus (top) and Zaskar (below) confluencing in Ladakh

appropriate environmental flows, linking conservation with poverty eradication, suggestions on climate change in relation to wetland on regulations of use of harmful pesticides considering their ecological and social implication etc. were highly appreciated and incorporated in the final text.

Comparison of progress vis-à-vis that achieved in the previous year's supported by time series data drafts and chart etc.

- 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. Funds were released to concerned organizations for three ongoing research projects.

State wise status

115 wetlands covering 24 States and 2 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.

Regulatory Acts/Rules governing the programme and promulgation of new acts

Ministry 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 4th 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 ₹ 13.00 crore has been made during the year 2012-13 for conservation and management of identified wetlands. An expenditure of ₹ 10.59 crore has been incurred till 31.12.2012.



CHAPTER-6
REGENERATION AND
ECO-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 four major schemes:

- (a) National Afforestation Programme (NAP) Scheme
- (b) NAEB Scheme: The major components of the Scheme are:
 - i. Support to Regional Centres (RCs)
 - ii. Monitoring and Evaluation (M&E)
 - iii. Communication
 - iv. Grants in Aid for Greening India Scheme
- (c) Eco Development Forces (EDF) Scheme
- (d) Green India Mission

(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 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 ₹ 2939.73 crores to treat a total area of 18.88 lakh ha. (as on 31.12.2012). 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 Odisha.
- As on 31.12.2012, ₹89.36 crore was released to State Forest Development Agencies (SFDA) during the year 2012-13 for implementation of National Afforestation Programme (NAP).

Year-wise and State-wise progress of National Afforestation Programme in the Tenth and Eleventh Five Year Plan and during the current year is given in Table-48 and Table-49 respectively.

New initiatives under the Scheme

A number of initiatives have been taken by the Ministry to expedite the implementation of the scheme as well as 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

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Table-48. Year-wise progress of National Afforestation Programme (As on 31.12.2012)

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	26 SFDA Projects	—	57126	309.99
2011-12	26 SFDA Projects	—	141448	303.00
2012-13 (As on 31.12.2012)	23 SFDA Projects	—	—	89.36

* Area approved for advance soil work/preparatory plantations during the year for all ongoing FDA projects.

- 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. Support to Regional Centres (RCs)
- ii. Monitoring and Evaluation (M&E)
- iii. Communication
- iv. Grants in Aid for Greening India Scheme

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, Bengaluru,

Table-49. State-wise status of SFDA projects (from 1.4.2010 to 31.12.2012)

S. No.	State	Total Cost	Amt. Released	Approved Advance Work*
		(Rs. in crore)		(in Hectares)
1	Andhra Pradesh	40.83	28.34	7794
2	Bihar	13.43	12.40	5647
3	Chhattisgarh	73.39	64.16	9547
4	Goa	0.00	0.00	0
5	Gujarat	84.70	66.95	12910
6	Haryana	47.12	40.32	4245
7	Himachal Pradesh	18.10	8.67	4212
8	Jammu & Kashmir	22.61	10.88	4857
9	Jharkhand	50.05	23.84	4815
10	Karnataka	40.81	25.85	9523
11	Kerala	32.00	15.21	3613
12	Madhya Pradesh	86.46	58.04	23219
13	Maharashtra	89.55	53.80	9854
14	Odisha	40.24	21.59	7410
15	Punjab	3.93	1.22	625
16	Rajasthan	22.44	13.05	3700
17	Tamil Nadu	16.77	11.99	2984
18	Uttar Pradesh	68.27	54.37	15775
19	Uttarakhand	26.75	11.09	10225
20	West Bengal	15.36	12.28	5175
	Total (Other States)	792.81	534.05	146130
21	Arunachal Pradesh	10.32	7.18	3125
22	Assam	25.84	15.50	0
23	Manipur	28.32	25.71	7849
24	Meghalaya	22.94	15.04	8730
25	Mizoram	32.03	28.87	4970
26	Nagaland	30.72	26.26	10000
27	Sikkim	24.87	23.17	5279
28	Tripura	33.77	26.58	12491
	Total (NE States)	208.82	168.30	52444
	G. Total	1001.63	702.35	198574

*Approved advance work is updated till 31.04.2012

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 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 interdepartmental 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. The financial assistance provided to Regional Centres during financial year 2011-12 and 2012-13 (current financial year upto 31.12.2012) is given in Table-50.

Monitoring and Evaluation (M&E)

It is proposed to undertake evaluations of the ongoing projects and schemes 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;

A sum of ₹0.64 crores is the budgetary outlay of 2012-13. Out of which ₹5.18 lakh has been released till 31.12.2012.

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. This includes print publicity, advertisements, audio spots, audio-visual spots and TV commercials in regional and local.

During 2012-13 an amount of ₹1.20 crores has been provided as the outlay for various items under Communication out of which ₹5.58 lakhs has been released upto 31-12-2012.

Grants in Aid for Greening India Scheme

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

Table-50. Financial assistance provided to Regional Centres during financial year 2011-12 and 2012-13

S. No.	Name & Address of Regional Centre	State/UTs covered as per MOU	Financial Assistance (Rs. In lakh)	
			2011-12	2012-13 (upto 31.12.2012)
1.	Regional Centre for NAEB Agriculture Finance Corporation Ltd. B-1/9, Community Centre, Janakpuri, New Delhi-110058	Haryana, Rajasthan, Uttar Pradesh, Uttrakhand and UT of Delhi	90.81	76.00
2.	Regional Centre for NAEB Agriculture Finance Corporation Ltd. Dhanraj Mahal, 1st Floor, CSM Marg, Bombay-400001	Maharashtra, Gujarat, Goa and UTs of Daman & Diu, Dadar & Nagar Haveli	69.94	72.00
3.	Regional Centre for NAEB North Eastern Hill University, Shillong - 793 014	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura	77.00	75.00
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	77.31	70.00
5.	Regional Centre for NAEB Indian Institute of Forest Management, Nehru Nagar, Post Box no. 357, Bhopal-462003	Chhattisgarh, Madhya Pradesh and Orissa	71.81	64.00
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	55.88	70.00
7.	Regional Centre for NAEB Jadavpur University, Kolkata-700032	Bihar, Jharkand, Sikkim, West Bengal and UT of Andaman & Nicobar Islands	68.56	74.00

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:-

Table-51. 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
2012-13	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 on-going projects as no new project was sanctioned.

- Raising mass awareness about QPM and tree planting
 - Enhancing the capacity for QPM production
 - 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. The Budget Estimate for ongoing projects under the Scheme for 2012-13 is ₹0.50 crore.

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 were implementing majority of Tree Planting projects.

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 and managerial

Table-52. The progress of ETF Battalions during the year 2011-12

Battalion	Location	No. of plants planted (in lakh)	Plants survived (in lakh)	Survival % age	Area Covered (in ha.)
127 Inf. Bn(TA) Eco	Jaunpur District Tehri Garhwal (Uttarakhand)	4.01	4.28	70.00	400
128 Inf. Bn(TA) Eco	Shri Mohangarh District Jaisalmer (Rajasthan)	4.00	2.92	73.07	500
129 Inf. Bn(TA) Eco	Bahu Jindra Project (J&K)	1.20	0.90	75.00	265@
130 Inf. Bn(TA) Eco	Pithoragarh (Uttarakhand)	5.00	4.35	87.00	500
134 Inf. Bn(TA) Eco	Gamani (Assam)	9.10	5.00	55.00	854
135 Inf. Bn(TA) Eco	Chirang Res. Forest (Assam)	9.29	8.55	92.00	929
	TOTAL	32.60	26.00		3448.00

@ 100 ha. area covered under CAMPA Project

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 2011-12 is given in Table-52.

Six ETF battalions are being supported under the EDF Scheme in the States of Uttarakhand, Rajasthan, Jammu & Kashmir and Assam. Revised Estimate for the scheme during 2012-13 is ₹ 20.60 crores out of which ₹12.60 crores has been reimbursed to Ministry of Defence till 31.12.2012.

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

The National Mission for Green India is one of the eight missions under the National Action Plan on Climate Change (NAPCC). The Mission for acknowledges the influences that the forestry sector has on environmental amelioration though climate mitigation, food security, water security, biodiversity conservation and livelihood security of forest dependant communities. The Mission is launched to enhance ecosystem services such as carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; as well as other provisioning services such as fuel, fodder, small timber and non-timber forest products (NTFPs).

Objectives of the Mission

- a) Increased forest/tree cover on 5 mha of forest/non-forest lands and improved quality of forest cover on another 5 mha (a total of 10 mha).
- b) Improved ecosystem services including biodiversity, hydrological services and carbon sequestration as a result of treatment of 10m ha.
- c) Increased forest-based livelihood income of about 3 million households living in and around the forests.
- d) Enhanced annual CO₂ sequestration by 50 to 60 million tonnes in the years 2020.

Key Core features of the Mission

The Mission addresses the qualitative improvement of the forests along with increased forest cover and focuses on ecosystem services with the emphasis on biodiversity, water, improved biomass and carbon sequestration as a co-benefit. It addresses ecosystem approach and habitat diversity like grasslands, wetlands, pastures, forests in urban and periurban areas and other critical ecosystems. An important feature of this Mission is the thrust on landscape based approach in which the interventions at a scale of 5000 to 6000 hectares is done at a time which is prioritized based on criteria including climate vulnerability. The forest and non-forest areas are simultaneously treated and the drivers of degradation are effectively addressed.

The local communities will play a key role in project governance and implementation with a bottom up participatory approach. The Mission will bring primacy to Gram Sabha as an overarching institution to oversee Mission implementation at the village level. The committees set up by the Gram Sabha, including revamped JFMCs, CFM groups,

Van Panchayats, Committees set up under Forest Rights Act; Biodiversity Management Committees etc., will be strengthened as the primary institutions on the ground for nested decentralized forest governance in rural areas.

The Mission will invest in the development of a cadre of community-based change agents from amongst educated community youth. These community foresters will facilitate planning, implementation and monitoring of the Mission activities at the local level. This will provide skilled employment opportunity to about one lakh educated community youths.

Cross Cutting Interventions

Several cross activities have been incorporated in the Green India Mission. To effectively address the livelihood enhancement, a provision of ₹ 15-20 lac for each village has been envisaged. The wildlife corridors will be identified and the mission aims at working with an array of state holder to maintain the cover and also seeks rapid agency response in case of crop raiding. The mission also strives to support the community conserved area and also envisages identifying and protecting areas/catchments of hydrological importance.

Monitoring Mechanism

The Mission will focus beyond input level/activity to outcome level over time by a combination of impact assessment at the field-unit level and application of modern technology like Remote Sensing and GIS. Monitoring under the Mission will help in timely information of planning and feedback to multiple agencies/stakeholders. In addition to on-ground self-monitoring by multiple agencies and communities, audit by Government bodies the Mission would support use of Geomatics (remote sensing with GPS mapping of boundaries) for monitoring at the

out put/outcome level. In addition, a few pilot areas will be intensively monitored to assess the impact and efficacy of different old and new practices, in tandem by the implementing agency, the Forest Department, and a support organization. The Mission will similarly require that the Gram Sabha carries out a social audit of all expenses incurred by the committees constituted by the Gram Sabha and these reports would be shared in the public domain.

The Mission Cost

Total Mission cost is ₹ 46000 crores spread over 10 years, coinciding with the Twelfth and Thirteenth five year Plan periods, with the year 2011-12 being the preparatory year for the Green India Mission. Green India Mission will partly funded through convergence with schemes/Funds like MG NREGS, National Afforestation Program (NAP), Integrated Forest Management Scheme; XIII Finance commission award and schemes of other Ministries in the identified landscapes under the Mission. Additional funding will be met through National clean energy Fund, budget support through Ministry of Environment & Forests and gaps, if any, would be met from external support.

Timeframe

The actual implementation period of the Mission will spread over 10 years, coinciding with the 12th and 13th five year plan periods. The preparatory phase of the Mission will be devoted to carrying out institutional reforms, setting up of the Mission organisation, identification of sub-landscapes/areas for the Mission interventions, identification of partners, and awareness and capacity building etc.,

Table-53. Statement of funds released for preparatory activities during 2011-12 under Green India Mission

S. No.	State	Funds released (Rs. in Lakhs)
1	Maharashtra	405.77
2	Jharkhand	147.00
3	Kerala	194.60
4	Tamil Nadu	72.15
5	Gujarat	133.80
6	Rajasthan	275.25
7	Himachal Pradesh	126.50
8	Jammu & Kashmir	64.00
9	Odisha	107.50
10	Punjab	125.50
11	Haryana	357.00
12	Chhattisgarh	972.00
13	Assam	130.00
14	Andhra Pradesh	89.53
15	Manipur	40.50
16	Nagaland	141.50
17	Tripura	350.50
18	Karnataka	267.45
19	Madhya Pradesh	823.50
20	Uttar Pradesh	119.50
21	Uttarakhand	51.00
	Total	4994.55

Approach to meet the objectives

As stated earlier decentralized Forest Governance and Polycentric approach has been envisaged with the Supremacy of Gram Sabha and its Committees and the revamped Joint Forest Management Committees (JFMC) to be the committees of Gram Sabha. The State

Forest Development Agency (SFDA) and Forest Development Agency (FDA) will be revamped to facilitate implementation by Gram Sabha, strengthened capacity of forest department to assume new roles. Other stakeholders like the NGOs and Schools/Colleges will be involved in the implementation of the mission. Private sector partnership is short especially in agro forestry, institutional lands, abandoned mines. Convergence with existing programs and other Missions and research in field of carbon capture potential by forest types, adaption options etc. will also facilitate effective implementation of the mission.

An allocation of ₹50 crore was set aside from the National Clean Energy Fund for the preparatory year 2011-12 which has been released to 21 states for 71 landscapes involving 708 Villages. The state wise release details are given in the Annexure. The interventions in the preparatory year include micro planning, entry point activities, nursery development, landscape identification awareness and outreach, etc., The funding for the major interventions would be based on the perspective plans of these landscapes.



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 to many research institutions 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. The overall objective of the R&D Scheme of the Ministry is "to promote basic and applied research in various facets of ecology and environment."

Objectives

The main objectives of research support are:

- 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 (e.g. 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 environmental Sciences.
- To promote development of infrastructure facilities, where necessary, for undertaking Environmental Research.
- To nurture trained scientific manpower and recognize established scientists through National Fellowship programmes, Chairs, National Environmental Sciences Fellows Programme and Post Doctoral Fellowship Programme
- To generate document and analyze information for taking policy decisions relating to environment and natural resources, including preparedness for international negotiations.
- To facilitate database management at one single point in the Ministry.

Revised Guidelines for Support to Environmental Research

During the year 2012-13, Ministry brought out new "Guidelines for Support to Environmental Research" which *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 revised 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. The Research projects

are to be supported in the identified thrust areas in the following two modes:-

Invited Proposals: Proposals will be invited under this category by the Ministry through a transparent procedure of an open advertisement. Selection, among the proposals received in response, will be made competitively on the basis of their technical soundness including research credentials of the proposed research team and their envisaged outcomes.

Commissioned Proposals: Depending upon specific needs of the Ministry or to focus research efforts on important areas of ecology & environment, the Ministry may directly commission research studies to one or a network of empanelled universities, research institutions, NGOs, Government ventures, public and private sector institution identified on the basis of their recognized capabilities in the concerned area through a transparent process.

The Ministry could also directly commission, through a transparent process, All India Coordinated Research Programmes through multi-disciplinary and inter-disciplinary approach involving a group of institutions on a specific subject of topical interest to the Ministry as identified by brainstorming meeting(s) with experts on the subject.

During the year an **Apex Committee on Research in Environment** has been constituted to inter-alia provide over all direction to the research endeavours of the Ministry in the broad area of ecology and the environment. The Ministry has constituted Programme Advisory Committees for three identified research programmes viz. Environmental Research Programme (EnvRP), Ecosystems Research

Programme (EcRP) and Research Programme in Socio-Economic issues of Environment (RPSE). These Committees would recommend projects for consideration of the Apex Committee.

The following new initiatives have been proposed to be launched in XIIth plan under the R&D Scheme:

- Post Doctoral Fellowship Programme in Environment and Ecology,
- Chair in the name of an eminent scientist in frontier areas of environment and ecology and
- Launching of online tracking and monitoring system for new research projects and database of research projects

Programme-wise Progress and Activities

Environmental Research Programme (EnvRP)

The EnvRP specifically deals with the "Brown Issues", i.e. problems related to pollution, climate change, hazardous waste management, agro-chemicals, waste minimization and reuse, carrying capacity studies, development of ecofriendly and cleaner technologies providing scientific inputs to address policy problems relating to environmental pollution control and management, ecological restoration and bioremediation, environmental health and toxicology etc.

The 1st meeting of the Committee was held during 17-18 December, 2012, where progress of 15 ongoing projects was reviewed and mid-course corrections were suggested on case to case basis. The Committee also appraised 28 new projects received under the Environment Research Programme (EnvRP), out of this 3 were recommended to the Apex Committee for funding, 2 Principal Investigator's (PIs) called for presentation for their respective proposal

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Fig-31. A view of Apatani plateau in Arunachal Pradesh

before the Advisory Committee, 2 proposals requested to incorporate suggestions in the revised proposals and 3 proposals were sent to Expert Peer Reviewers for their comments. The second meeting of the Advisory Committee was held on 6-7 February, 2013, where new proposals will be taken up for appraisal and for recommendation to the peer reviewers.

Ecosystems Research Programme (EcRP)

The Ecosystem Research Programme (EcRP) deals with "Green issues" relating to ecology, conservation of natural resources, Eastern and Western Ghats, aquatic and terrestrial ecosystems, Mountain ecosystems, tropical rainforests, wetlands, mangroves and coral reefs, biosphere reserves, biodiversity and the study of inter-relationships between man and environment and seeks to generate scientific knowledge needed to manage natural resources wisely.

The 1st meeting of the Committee was held during 22-23rd November, 2012, in which progress of 17 ongoing projects was reviewed and mid-course corrections were suggested on case to case basis. The Committee also appraised 33 new projects received under Ecosystem Research Programme (EcRP) out of this 21 projects were sent to Expert Peer

Reviewers for their comments. The second meeting of the Committee was held on 4th - 5th February, 2013, where new proposals were taken up for appraisal and for recommendation to the peer reviewers.

During the year 2012-2013, Six projects were completed. Details are at **Annexure-II**.

Research Programme in Socio-Economic issues of Environment (RPSE)

This programme supports research on environmental and ecological economics, socio-economic issues arising out of extant as well as new contemplated legislation (s), tribal, rural, urban issues vis-a-vis legislation, role of gram panchayats and civil society in the implementation of environmental legislation, etc. The 1st meeting of the Committee was held on 7th February, 2013, where new proposals were taken up for appraisal and for recommendation to the peer reviewers.

All India Coordinated Programmes in identified research priority areas

The Ministry also formulated and launched All India Coordinated programmes. The All India Coordinated programme would focus on particular priority area of research identified either by the concerned Programme Advisory Committee or Apex Committee of Research.

During the year an All India Coordinated Research Project on Sacred Groove Ecosystem Services Assessment (SGESA) has been launched. There are 15 centres under the project all over the country. The project is progressing well. The list of the projects is at **Annexure-___**.

National Environment Protection Training and Research Institute (NEPTRI)

The National Environment Protection Training and Research Institute (NEPTRI) would

be a joint venture between the Ministry and Government of Andhra Pradesh. The Detailed Project Report (DPR) for the establishment of NEPTRI, as joint venture, has been approved by the Ministry. The processing of SFC memo for the upgradation of Environment Protection Training and Research Institute (EPTRI) to NEPTRI as joint venture between the Ministry and Government of Andhra Pradesh is underway.

High Level Working Group to study the preservation of the ecology, environmental integrity and holistic development of the Western Ghats in view of their rich and unique biodiversity

The Ministry has constituted a High Level Working Group under the Chairmanship of Dr. K Kasturirangan, Member, Planning Commission to *inter alia* examine the Western Ghats Ecology Expert Panel Report in a holistic and multidisciplinary fashion keeping in view the comments received from the concerned State Governments/Central Ministries/Stakeholders and other related important aspects such as preservation of precious biodiversity, needs and aspirations of the local and indigenous people, sustainable development and environmental integrity of the region, climate change and constitutional implications of centre-state relations and to recommend further course of action to the Government.

Ecologically Sensitive Areas

Introduction

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, Mahabaleshwar-Panchgani, Mount

Abu and Sultanpur under the Environment (Protection) Act, 1986. The Zonal Master Plan / Area Development Plan for all notified / to be notified environmentally sensitive areas would be prepared by the concerned State Governments as per the provisions of the 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.

Programmes / achievements made during the year

The following final notifications were published during the year:

- Area around Girnar Wildlife Sanctuary, Gujarat, S.O. 1260(E) Dated 31st May 2012.
- Area around Narayan Sarovar Wildlife Sanctuary, Gujarat, S.O. 1257 (E) Dated 31st May 2012.
- Area around Purna Wildlife Sanctuary, Gujarat, S.O. 1259(E) Dated 31st May 2012.
- Area around Vansda National Park, Gujarat, S.O. 1258 (E) Dated 31st May 2012.
- Area around Bandipur National Park, Karnataka, S.O. 2364 (E) Dated 4th October 2012.
- River Bhagirathi from Gaumukh to Uttarkashi as Eco-Sensitive Zone in Uttarakhand, S.O. 2930(E) Dated 18th December 2012.

An Expert Committee has been constituted to examine and assist the Ministry in preparing

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the final notifications on Eco Sensitive Zones to be issued under the Environment (Protection) Act, 1986 and Environment (Protection) Rule, 1986 for a period of five years. The Committee will also examine the zonal master plans of the Eco Sensitive Zones submitted by the State Governments/UTs as per the provisions of the Eco Sensitive Zone Notifications.

Financial Progress for Year 2012-13 (till 31st December, 2012)

The total allocation for R&D Scheme during 2012-13 is ₹ 6.50 crores (RE). 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 settlements of accounts for completed projects during current financial year 2012-13.

Achievements during the 2012-13 (till 31st December 2012)

- New Guidelines for Support to Environment Research-2012 giving the procedure, format, thrust areas and terms & conditions of the grant, etc. have been published and displayed on Ministry's web-site for public information.
- Standing Finance Committee (SFC) Memo for continuation and Modification of the ongoing Research and Development (R&D) Scheme from 11th Five Year Plan (FYP) to 12th Five Year Plan has been approved.
- During the year an Apex Committee on research in environment has been constituted to inter-alia provide over all direction to the research endeavours of the Ministry in the broad area of ecology and the environment.
- During the year, Three Programme Advisory Committees have been constituted for different programmes of the RE-Division to

appraise the research projects submitted in identified thrust areas.

- As per New Guidelines for Support to Environment Research-2012 the Ministry has invited research proposals in identified thrust areas through open advertisement, the last date of receipt of application was 31.12.2012. The Ministry has received about 800 projects, which are under consideration.
- 5 meetings of the Programme Advisory Committees have been held in which about 45 new projects were considered and three meetings are scheduled to be held during February 2013.
- Under R&D Scheme 20 new research projects have been initiated and 19 research projects have been completed in different programmes of RE-Division and their outcomes of some of them have been published & disseminated among scientific community as well as displayed in the Ministry's web-site.
- About 50 applications have been received under the National Environmental Sciences Fellowship Programme in response to the advertisement and these are being processed.
- The 'Mahatma Gandhi Chair for Ecology and Environment' which was set up earlier at the Centre for Biodiversity Studies, Baba Ghulam Shah Badshah University, Rajouri, J&K continued during 2012-13.
- Revised guidelines for Pitambar Pant National Environment Fellowship Award and Dr. B.P. Pal National Environment Fellowship Award giving the procedure, format and terms & conditions have been prepared and under press for publication.

- New initiatives viz. Post-doctoral Fellowship Programme (PDFP) to encourage and nurture young scientist to continue working in the areas related to environment and ecology and Establishment of a New Chair in the name of Distinguished Scientist in the area of Environment and Ecology has been initiated under the R&D Scheme.

National Natural Resource Management System (NNRMS)

The scheme National Natural Resources Management System (NNRMS) of the Ministry is part of an umbrella scheme of the Planning Commission – Planning Committee – National Natural Resources Management System (PC-NNRMS) and is in operation since, 1985. The main objective of PC-NNRMS is utilization of remote sensing technology for inventorization, assessment and monitoring of country's natural resources. A Standing Committee on Bio-resources and Environment (SC-B) has been constituted by the Planning Commission under the Chairmanship of Secretary (E&F) with the following objectives:

- Optimal utilization of country's natural resources by having 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.

To fulfill the above objectives, the PC-NNRMS has constituted different Standing Committees for various themes in concerned Ministries. The Standing Committee on Bio-resources and Environment (SC-B) is one of the Standing Committees constituted by PC-

NNRMS under the Chairmanship of Secretary (E&F) with Members from concerned line Ministries / Departments. It has so far met 26 times. About 114 projects addressing key environmental and ecological issues covering eco-system inventorying and monitoring, desertification, environmental impact assessment, coastal land use and landform, snow and glaciers, wetland inventory and assessment etc. have been sponsored. Of these, 84 projects have been completed. Some of the mega projects undertaken and completed under this programme include the following:

- Forest Type Mapping on 1:50,000 scale of Entire Country Coordinated by Forest Survey of India (FSI).
- Mapping of Wildlife Sanctuaries and National Parks on 1:25,000 scale Coordinated by Wildlife Institute of India (WII).
- Coastal Studies (Land use, Mangroves, Coral Reefs, etc.) for entire Indian Coast (1:25,000 scale)
- Snow & Glaciers mapping of entire Himalayas (1:250,000/50,000 scale) Coordinated by Space Application Centre (SAC), Indian Space Research Organisation (ISRO)
- National Wetland Inventory and Assessment (1:50,000 scale) Coordinated by SAC (ISRO)

National Wetland Information System and National Coastal Zone Information System in GIS Platform have been developed and is being extensively used in wetland notification implementation and Coastal Regulation Zone (CRZ) implementation.

In order to streamline the projects NNRMS SC-B has reconstituted Technical & Financial Sub-Committee to scrutinize/review

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all the proposals submitted for funding under NNRMS SC-B from the technical and financial angle. Only those proposals recommended by the Sub-Committee are taken up by NNRMS, SC-B for financial assistance. The Committee also oversees and monitors the progress of sanctioned projects.

The potential user agencies for utilizing the outcome / information generated in the projects sanctioned by the Ministry under NNRMS programme are the Central Government Departments / Agencies and the Ministry of Environment and Forests itself including the various organizations under its administrative control like FSI, Zoological Survey of India (ZSI), Botanical Survey of India (BSI) etc.

Financial Progress for Year 2012-13 (As on 31st December, 2012)

During the financial year 2012-13, the financial outlay under NNRMS Scheme is ₹ 6.15 Crores (Revised Estimate) and the entire amount would be utilized for ongoing and new projects based on the recommendations of the Technical & Financial Sub-Committee of NNRMS SC-B and final approval of the Standing Committee on Bio-resources and Environment of NNRMS (SC-B). Servicing and funding is being provided to 29 ongoing projects.

Achievements during the 2012-13 (up to 31st December 2012)

- Standing Finance Committee (SFC) Memo for continuation of the ongoing National Natural Resources Management System (NNRMS) Scheme from 11th Five Year Plan (FYP) to 12th Five Year Plan has been approved by the Ministry.
- During the year the Technical & Financial Sub-Committee of National Natural Resources Management System (NNRMS) on Bio-resources and Environment SC-B

has been reconstituted to appraise the research projects submitted under NNRMS programmes.

- As per New Guidelines for Support to Environment Research-2012, the Ministry has invited research proposals under NNRMS Scheme through open advertisement on MoEF web-site, the last date of receipt of application was 31.12.2012. The Ministry has received about 50 projects, which are under consideration.
- During the year 2012-13 under NNRMS programme, 04 new research projects have been initiated, 06 research projects have been completed and their outcomes of some of them have been published & disseminated among scientific community as well as displayed on the Ministry's web-site.
- A first-ever publication "Forest-Type Atlases of India" has been brought out by the Forest Survey of India under the NNRMS Programme of the Ministry. This is based on the Champion & Seth classification (1968), which is the standardized forest type classification system used in India. The Forest Type Atlases contains maps that would provide a scientific and robust basis for valuation of forest and thus would be a practical application while enforcing provisions of Forest conservation Act 1980, particularly in determining NPV of forest. Forest type maps would also be useful in the studies of impact of climate change on forest and biodiversity.
- A book on "Coastal Zones of India" has been brought out by the Space Application Centre, Space Application Centre (ISRO), Ahmadabad under the MoEF sponsored project under the NNRMS Programme of

the Ministry. This book is an outcome of the national project on "Coastal Zone Studies" undertaken by the ISRO at the behest of Ministry of Environment & Forests. The project addressed the various aspect of the Indian Coastal Zone, including preparation of baseline information on CRZ inventory of coastal land use including ecologically sensitive areas for the entire Indian coast as 1:25,000 scale. These maps have been extensively used by the state environment department and the MoEF in providing environmental clearances and in implementing CRZ notification. The book provides information covering the following: (i) Inventory of the coastal land use along with demarcation of HTL/LTC and Ecologically Sensitive Areas (ESAs). (ii) Mapping and monitoring of coral reefs and mangroves (iii) impact of sea level rise on the Indian Coastal Environment and (iv) development of Coastal Zone Information System (CZIS).

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 its 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). 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

- Integrated Decision Support System (DSS) has been developed for generating water supply scenario for different years till 2030 for Upper Kosi watershed as a pilot model. A pilot scale model of

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- participatory water harvesting and supply scheme is developed to cater the need of 20 households in Chauna hamlet of Pachchisi village (Almora district) of the watershed.
- Development of a sacred landscape model for eco-restoration and biodiversity conservation accomplished in Koli Dhek village of district Champawat, Uttarakhand.
 - Database was strengthened for air quality monitoring and aerosol climatology over north-western Himalayan region.
 - Towards promotion of ecotourism through home stay operations and linking biodiversity conservation with livelihood, a consultative workshop was organized on May 3, 2012 by North Eastern (NE) Unit of the Institute. Consultation was largely focused on the preparation of guidelines for home stay operations, which can be further utilized by the state government as one of the means of improving livelihood security of the locals.
 - Organization of an International workshop cum discussion meeting entitled 'Individuals and Groups' to explore possibilities of understanding theories of group and individual behaviour was organized by the Institute in collaboration with Indian Institute of Science, Bengaluru during May 22-31, 2012.
 - Taxonomic capacity building of regional researchers was attempted through a six day on site training cum workshop on "Taxonomy of Insect Pollinators" during 26-31 May, 2012.
 - Development of a long term implementation plan for execution of transboundary 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'
 - Showcasing on the richness, Representativeness and Uniqueness of Himalayan Biodiversity through side events and exhibition during the Convention of Parties (CoP-11) at Hyderabad during October 8-19, 2012. The events included (i) Managing Biodiversity in Transboundary Landscapes in the Hindu Kush Himalayas jointly with International Centre for Integrated Mountain Development (ICIMOD), Kathmandu (October 12, 2012); (ii) Conservation of Pollinators for Improved Livelihoods and Enhanced Ecosystem Services jointly with Food and Agriculture Organisation (FAO), Rome (October 18, 2012); (iii) Showcasing of richness, representativeness, uniqueness and life support values of Himalayan Biodiversity (October 8-19, 2012) in CEPA fair, and (iv) participation in "Citizen – Science" forum organized by Earthwatch Institute (October 10, 2012), etc.
 - Preparation of a compendium on Indian Biosphere Reserves as an updated baseline on the status of reserves.
 - The participatory action Research and Training Centers (RTCs) at Head Quarters (Kosi-Katarmal) and Triyuginarayan played catalytic roles in capacity building of the user groups on various rural technologies, either introduced or developed by the Institute.
 - Execution of community based natural resource management project for the promotion of livelihood through large scale plantation of horticultural crops bringing more than 60 ha of land under

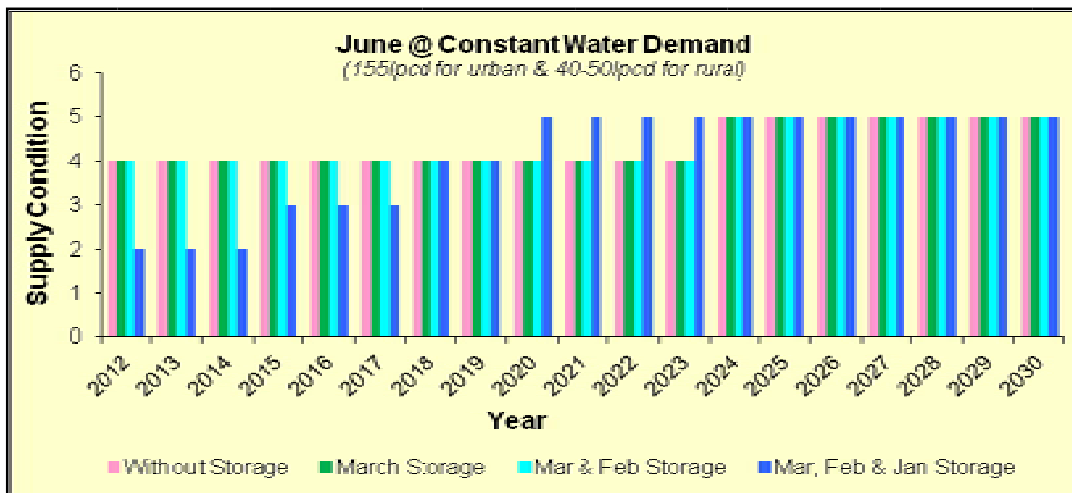


Fig-32. Projected supply and demand scenario of Kosi watershed

plantation of large cardamom (*Amomum subulatum*) and another 15 ha of land under orange (*Citrus reticulata*) and kiwi (*Actinidia deliciosa*) by the communities in Arunachal Pradesh.

Research and Development Achievements

Group 1: 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 art methodologies/approaches, models, policy briefs, etc. Achievements of this group include:

- To address water sustainability at mid-elevation Himalayan watersheds, daily discharge was recorded in selected villages of northern part of the Kosi basin. Based on the results, it is predicted that under present water availability pattern in-stream storage, urban water demand for the months of April – June can be satisfied only upto 2024. Water demand of June cannot be met fully beyond 2024 (Fig-32) even after small in stream storages as practiced today. Monsoon season storage (using large water retaining structure above 5 m height) may be required to satisfy the water demand in future.
- The R&D interventions for the maintenance and strengthening of the Sacred Landscape Model (SLM) in 14.3 ha degraded community land at 1745m elevation in Kolidhek village (Lohaghat) of Uttarakhand revealed the following: (a) The site has been dedicated to Mother Goddess 'Kali' by the villagers of Kolidhek and has become one of the religious sites; (b) The site has also become one of the sources of income generation as the farmers/women

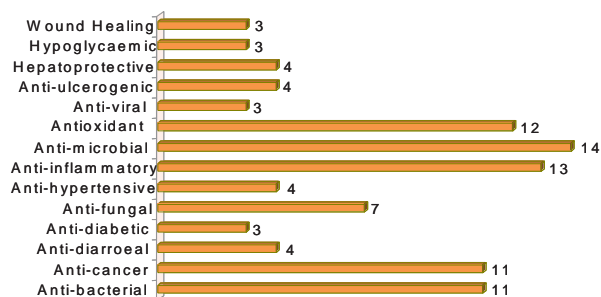


Fig-33. Therapeutic properties of medicinal plants used by the traditional *vaidyas* and village elders in Upper Alaknanda valley (Bar indicated number of species)

of 76 families (6 villages) collected almost 20 MT of green fodder from the project area in a year; (c) Eco-physiological health and leaf energy exchange characteristics of 20 promising tree species revealed suitability of *under-temperature* plants for afforestation on the exposed slopes of the mountains.

- Analyses of the energy use patterns revealed a rapid reduction in the watermills in Uttarakhand region. As per record, a total of 15,499 watermills were present in the state, however, during this year only 45% were working with an operational efficiency of 10-15%. Of the total, 600 watermills have been upgraded in the state by UREDA with an increased efficiency of 40-50%, which provides additional livelihood opportunities either through mechanical power generation or electro-mechanical operations. This has the advantage of generating 5kW power more than the traditional ones, which generate only 0.5-1.5kW.
- Restrengthening of Indigenous Knowledge (IK) and culture provides the basis for enhancement of conservation practices; 78 traditional herbal formulations used by the village elders for treatment of human ailments and 8 formulations for the treatment of cattle diseases were

documented. In order to link this knowledge with commerce, therapeutic properties of most of the ailments were attempted and a total of 101 therapeutic properties have been identified. Antimicrobial property was possessed by a large number of medicinal plants (Fig-33).

- Towards monitoring of snow and glaciers in the Himalayan Region, Gori valley and Dhauliganga region were selected (Fig-34). IRS, LISS-III data indicated that the total number of glaciers in 2001 in Dhauli Ganga region was 47 and the total area occupied was 328.92 km² in the same year, which has been found to be reduced to 326.88 km². This means a 0.99% loss of area in 9 Years. In Gori valley, a total of 75 Glaciers were digitized in 2001 with a total area of 199.32 km², which got reduced to 196.68 km², and the total loss was reported to be about about 1.32% in one decade.
- For the quantification of tectonic deformation field in the Himalayan region, functional operation of permanent and campaign mode GPS stations have been initiated. Daily up keep and data collection

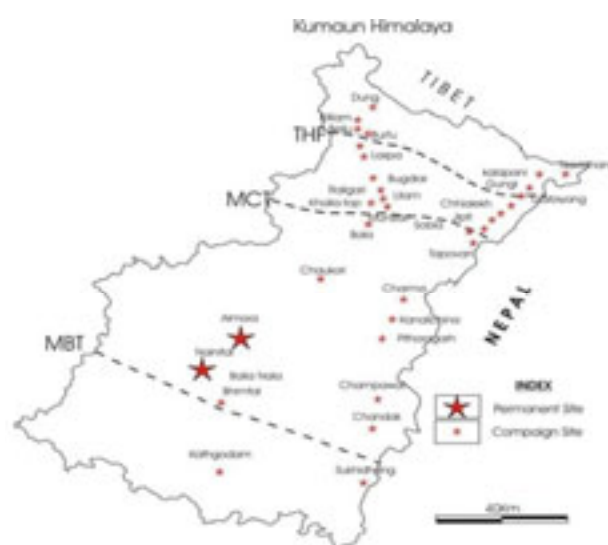


Fig-34. Map showing campaign sites along Kathgodam to Dung transect and Kali valley transect

from permanent GPS stations has been continued and V-SAT connectivity for data transfer from permanent GPS stations is under progress. The preparation for campaign mode study has started and field survey has also been conducted for finding the status of campaign stations.

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 the following:

- In-depth assessment of farming systems and their economic potential in the western Himalayan region was undertaken to identify issues and options for rural income diversification (on-farm and off-farm). Five promising farming practices, i.e., floriculture, mixed multi-layer vegetable cultivation, dairy farming, horticulture and integrated farming practices of the region were studied. Input:output ratio of these improved and somewhat “recent” farming practices were estimated to be: floriculture (1:5), horticulture (1:65) and mixed multilayer vegetable cultivation (1:7), which were found to be greater

than the cereal based traditional farming practice prevalent in the region.

- Forest ecosystem services in the central Himalayan mountains using Oak and Pine forests for their relative contribution revealed that Oak forests are rich in tree layer diversity (Shannon Wiener index) (1.6 vs. 0.23) as compared to Pine forests. Density of tree layer in Oak forests was high (1160 ind./ha) as compared to the Pine forests (1090 ind/ha). The total basal area of tree layer of Oak forests (60.75 m²/ha) was also found to be more than the Pine forests (54.11 m²/ha). Tree layer biomass (595 vs. 223 t/ha) and carbon (298 vs. 111 t/ha) stored in Oak forests was recorded to be higher as compared to Pine forests. Carbon sequestration rate was recorded to be slightly higher in Pine forests as compared to Oak forests (7.46 vs. 6.79 t/ha/yr). The total monetary value of carbon stock (@ ₹ 4160/tC) in standing above ground biomass was computed ₹12,39,680/ha for Oak forests and ₹4,61,760/ha for Pine forests. Monetary value of carbon sequestration was thus recorded to be higher for the Oak forests as compared to Pine forests (₹ 31,034 vs. 28,246 /ha/yr).
- Under the impact of urbanization on solid waste management and air pollution, ambient air quality (AAQ) was measured in different towns of Himachal Pradesh. Within ambient air, particulate pollutants like TSP (particles <100 μ), PM₁₀ (particles <10 μ) and gaseous pollutants like SO₂, NO₂ and NH₃ were monitored on diurnal basis starting from midnight (0 hr) up to morning 8 hr, than from 8 to 16 hr in a day and finally 16 hr to again midnight (24 hr IST). Many times the concentration of particulate pollutants was found to be

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Table-54. Air pollution levels at Hamirpur, Kangra and Chamba towns in Himachal Pradesh

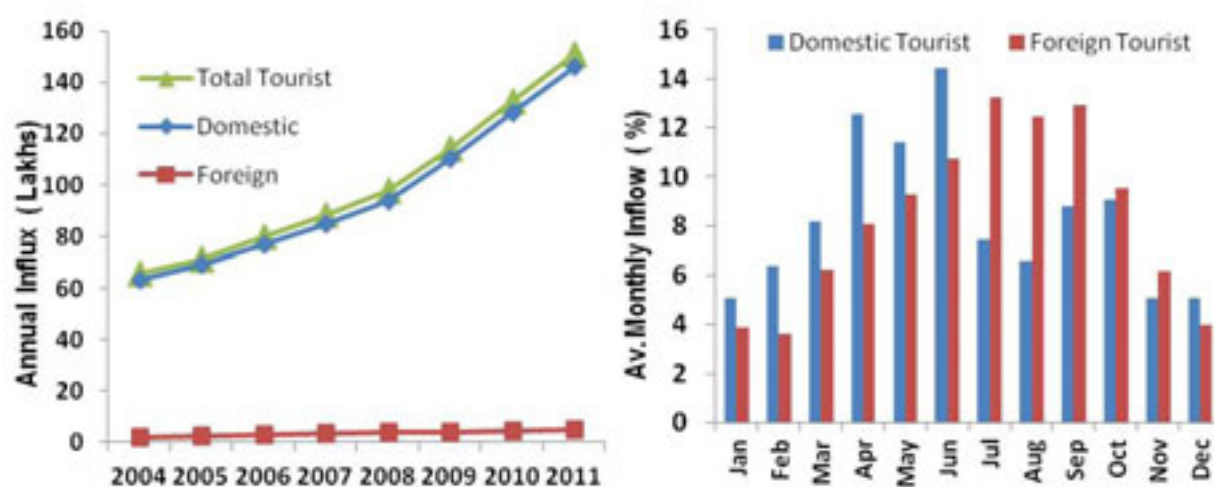
Study towns	Season/ duration	Concentration of different pollutants (in $\mu\text{g m}^{-3}$)				
		TSP	PM ₁₀	SO ₂	NO ₂	NH ₃
Hamirpur	Pre-monsoon	159.8±18.7	55.0±3.3	0.51±0.1	7.23±0.8	9.08±1.1
	Post-monsoon	196.0±18.8	111.7±4.6	0.98±0.2	17.40±1.9	20.30±3.6
Kangra	Pre-monsoon	73.5±7.3	49.2±6.0	0.39±0.1	6.34±0.4	12.32±1.1
	Post-monsoon	153.3±9.8	113.5±7.5	2.02±0.4	11.20±1.0	15.50±2.5
Chamba	Pre-monsoon	143.5±19.3	39.6±2.8	0.47±0.1	6.28±0.4	6.52±1.0
	Post-monsoon	151.4±15.0	58.2±4.4	1.22±0.1	16.00±1.4	12.60±1.9

above their permissible limits (i.e., TSP 200; PM₁₀ 100 $\mu\text{g}/\text{m}^3$) at the three studied sites. However, the gaseous pollutants were found to be well below their permissible limits (i.e., SO₂ 80; NO₂ 80; NH₃ 400 $\mu\text{g}/\text{m}^3$). The variation amongst these parameters between different towns and seasons was also recorded (Table-54).

- The tourist inflow statistics for the Himachal Pradesh state were compiled and analyzed for a broader understanding of its nature and trend-patterns. The inflow profile for the period 2004 -11 suggests nearly 2.5 times increase in tourist inflow from 6.55 million in 2004 to almost 15.09 million in

2011 (Fig. _). Linear mapping of Tourist Inflow (Y) for the subscribed period against time (X) - $Y_{2004-11} = 1212017(X-2003) + 4546102$; $R\text{-sq}=0.958$, $t\text{coeff} = 11.74$, $p=.00002$, suggests an average growth of 1212017 tourists per year. This also suggests the influence of tourism on income generation of the local people.

- In order to understand the aerosol climatology over northwestern Indian Himalayan region, conducted investigations have revealed maximum aerosol optical density (AOD) for the year 2011 and minimum for the year 2007, and thus showed 36.36% increase at 500 nm


Fig-35. Profile of annual inflow of tourists to Himachal Pradesh (2004-11).

during these years (Fig-36a). Similarly, the average value of AODs for forenoon (FN) and afternoon (AN) at ten wavelengths during the same period showed an increase in AOD values from FN to AN at 500 nm (52.38% and the overall increase: 45.16%; Fig-36b). Monthly mean value of α and β under the clear sky days was calculated and showed the maximum α value as 1.12 in February 2011 and minimum value 0.76 in December. α and β values were found to be inversely proportional (Fig-36c). The monthly mean Black Carbon Aerosol (BCA) concentrations at Mohal was maximum (4592 ngm^{-3}) in January, 2011 and minimum (1161 ngm^{-3}) in May, 2011 (Fig-36d). The BCA concentration generally showed increase with the increase in activities like biomass burning, forest fire and vehicular emission.

- For understanding the impact of policies on shifting agriculture in the northeast region of India, studies were initiated. Among the policies analysed, North East Forest Policy, 2001 revealed many positive aspects; and it acknowledges the need for increasing food production and stressed on the mandatory requirement of 33% and 66% forest cover for nation and hill areas, respectively. On the negative side, the policy failed to recognize shifting cultivation as a system of food production and a part of forestry system; it also encouraged to utilize jhum land for development activities and the practice to be replaced with other practices which may result in marginalization of cultivable land and increased social tension. The model on 'Integrated Agro-Horti-Silvicultural Cultivation' developed under the project has been adopted by Govt. of Arunachal Pradesh to address various issues in shifting agriculture. The

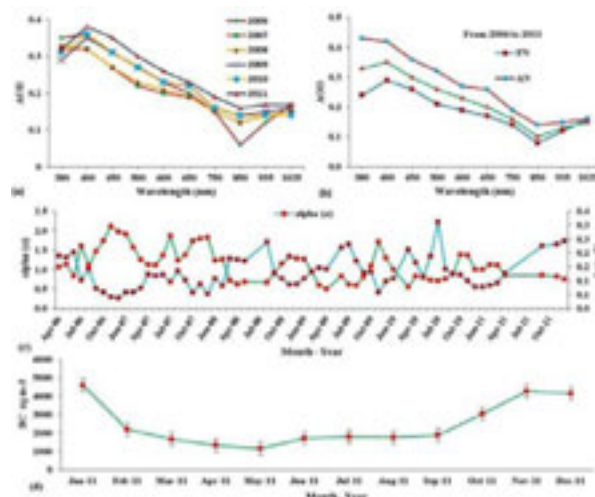


Fig-36. Aerosols at Mohal: (a) AOD, (b) FN and AN AOD, (c) monthly mean values of alpha (α), beta (β), and (d) monthly mean BCA concentration

model has been put in to practice in three districts of Arunachal Pradesh under the CAMPA programme.

- Detailed study on the adoption/adaptation of different options of improved livelihoods and management of natural resources during the last 15 years revealed that the farming system, as a whole, is under stress. Access to natural resources has been reduced, which has negatively impacted on overall farming system in the study areas. The major problems identified are shrinking water sources and basins, sectoral approach of the developmental projects, weak backstopping, poor access to science & technology know how, weak project withdrawal strategies and absence of structured monitoring and evaluation system. Marketing aspect, which was a major hurdle of the farming system, has been addressed through the establishment of 'Sunday Markets'. The State Mandi Parishad has started construction of permanent sheds which will be provided to the progressive farmers.

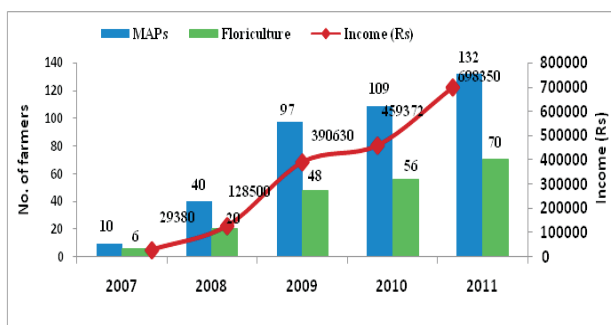


Fig-37. Adoption and monetary benefits to the cultivators of flower & MAPs of Champawat district

- Enhancement of livelihood security using cultivation of medicinal plants and floriculture in Champawat area of Kumaun Himalaya showed a positive impact. A total of 18.22 quintals of raw materials of selected MAPs and 147000 spikes of cut-flowers were harvested by farmers in three clusters after the fourth year of cultivation. This has resulted in encouraging monetary benefits after marketing to the traders in the local market (Fig-37). Over 9 ha of community land, under different clusters, has been rehabilitated through establishment of well tested prototypes during the period adopting CBNRM approach.
- To conserve biodiversity through community based natural resource management approach, 15 BMCs were constituted in Apatani plateau of Arunachal Pradesh and adopted by the Arunachal Pradesh Biodiversity Board (APBB). This has strengthened the continuity and better functioning of the BMCs, with a defined pathway for the existence of the BMCs after the exit of the project. About 57 ha and 20 ha land have been brought under *Taxus wallichiana* and *Michelia champaca* plantation, respectively, in the project villages. In addition, 500 number of *Castanopsis* spp. were also planted at 'Siikhe-Bo' CCA in Apatani plateau.

Considering the benefits of tree-crop farming system in climatically suitable regions of the area, cultivation of large cardamom has been promoted in 29.5 ha of land. Towards policy contribution, draft guidelines on Homestay and CCA have also been developed for the state.

- An attempt to link biodiversity with the livelihood of Arunachal Pradesh was initiated, which revealed that floral diversity of the area leads to the fulfillment of high dependency of various clans of Monpa and Sherdukpen tribes on the natural resources, in terms of food supplements, for fodder, fibre, material for construction & handicrafts, beverages, colouring agents (dyes) and more importantly for health care practices. Based on their utility and importance, different plants have got different cultural values and hierarchy. Documentation of 20 plant species preferred by Sherdukpen tribe was done and these were further analyzed. Eight plant species were culturally important and 12 were found to be of religious importance. Various animal body parts that are being traditionally used by Monpas in various aspects, e.g., as food, therapeutic purposes, traditional medicine and for storing various food grains and products were also documented. Various traditional institutions and their role in the management of agricultural systems amongst Monpas and Sherdukpen have also been documented.

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

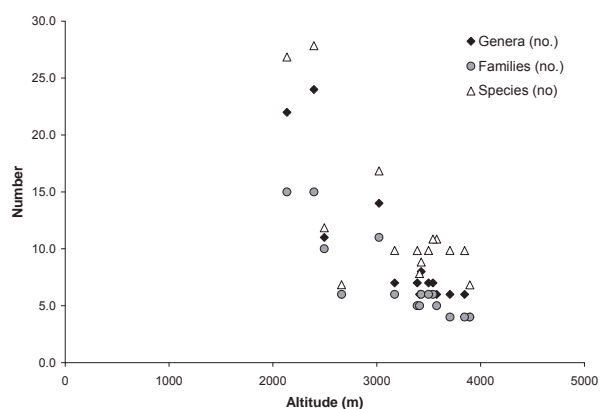


Fig-38. Number of species, genera and families for different study sites along altitudes in Yemtaar-Sukochuli-Neytham transect in Khangchendzonga Biosphere Reserve (West Sikkim)

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:

- Under the response assessment project, data sets on various aspects of biodiversity especially those suggesting/indicating changes were strengthened with respect to Nanda Devi Biosphere Reserves

(NDBR), Uttarakhand; Nargu Wildlife Sanctuary (NWLS), Himachal Pradesh; Khangchendzonga Biosphere Reserve (KBR), Sikkim; and the proposed Tawang-West Kameng Biosphere Reserve, Arunachal Pradesh. A trend of plant diversity distribution (species, genera and families) in one of representative sites has been presented (Fig-38).

- To promote sustainable utilization of high value species, suitable methods for drying of *Valeriana jatamansi* have been optimized, and the potential of their utilization in industrial sector was highlighted. Among the two different conditions (shade and hot air oven at 45°C), higher phytochemicals and more antioxidant activity in plant parts (leaves and rhizomes) dried in the hot air oven at 45°C were found (Table-55).
- Attempt was made to develop database of vascular plants of Western Himalaya in the electronic form, a total of 640 specimens belonging to 456 species, 193 genera and 40 families were digitalized and suitably edited. These specimens have been

Table-55. Effect of drying conditions of plant parts on antioxidant phytochemicals of *Valeriana jatamansi*.

Antioxidant phytochemicals (mg/g dry weight)	Plant source	Oven dry		Mean	Shade dry		Mean	LSD (P<0.05)
		Aerial Part	Root		Aerial Part	Root		
Phenol	Wild	10.99	12.79	11.89	7.44	6.21	6.82	2.33
	Planted	18.44	7.66	13.05	10.13	7.56	8.84	
Flavonoid	Wild	4.34	4.19	4.26	5.51	4.66	5.08	4.11
	Planted	4.40	4.45	4.43	6.89	4.60	5.75	
Tannin	Wild	3.13	2.94	3.03	2.96	2.74	2.85	3.26
	Planted	3.09	2.65	2.87	2.90	2.53	2.71	



Fig-39. Calico flower (*Aristolochia littoralis*)
– commonly used in traditional medicine

housed in the herbarium of GBPIHED. The nomenclature was authenticated with the help of relevant floras and monographs.

The valid names have been incorporated in the data sheet. The complete data sets of 640 specimens have been entered as per GBIF format and the digitalized images have been incorporated along with the data sets.

- Towards promoting the use of *Ginkgo biloba* in pharmaceutical industries, antimicrobial activities against different organisms were conducted; it was found that bacteria are the most sensitive to antimicrobial substances, followed by actinomycetes and fungi. Methanolic extracts exhibited maximum activity, followed by ethyl acetate and n-butanol extracts. The results obtained in minimal inhibitory concentration (MIC) experiments were found to be in line with those obtained from antimicrobial activity plate assays.
- Propagation protocols, multiplication and field evaluation of selected species for the production of quality planting material

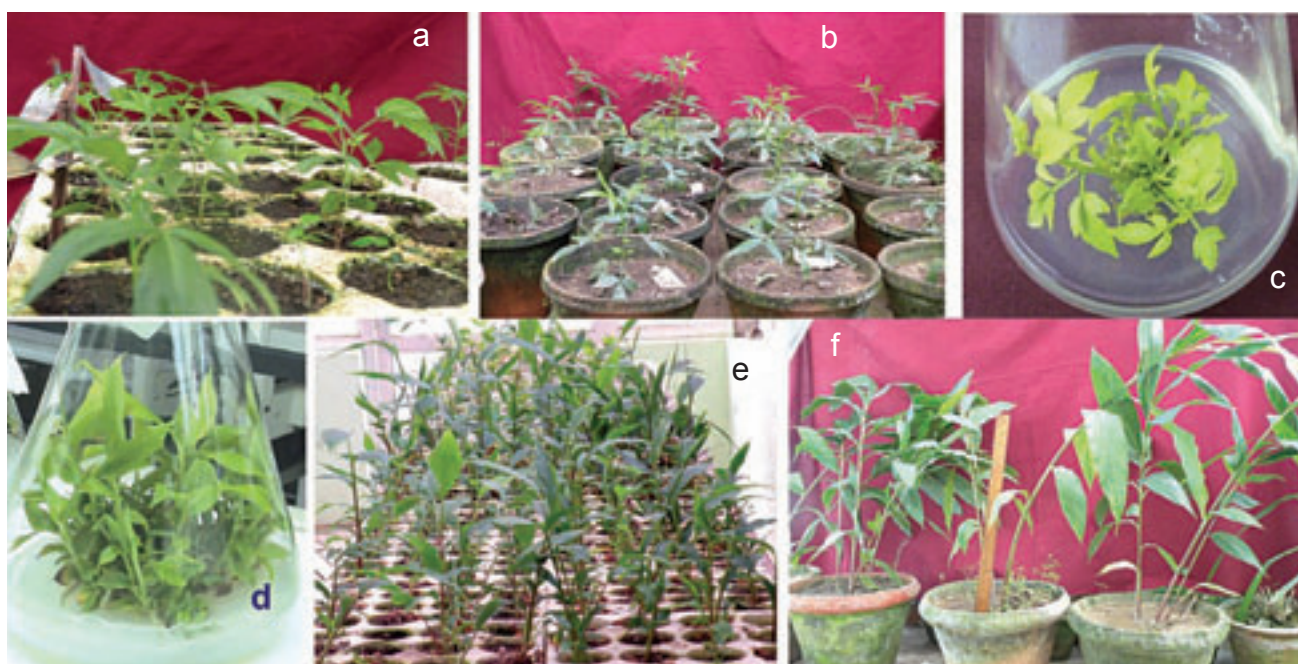


Fig-40. Propagation of *Z. armatum* and *A. subulatum*. (a) Seedlings obtained following acid treatment to *Z. armatum* seeds, (b) saplings of the same in pots under green house conditions, (c) multiple shoot formation in *Z. armatum* following culture on MS medium supplemented with growth regulators, and various stages during in vitro propagation of *A. subulatum* (d-f).

were carried out. In case of *Zanthoxylum armatum* large number of plants were obtained following seed treatments with different concentrations of sulphuric acid after 140 days (Fig-40 a&b). Nodal explants taken from branches of *Z. armatum* trees were multiplied in MS medium supplemented with auxins and cytokinins; following shoot proliferation and further multiplication, different treatments were provided to induce root formation in these shoots (Fig-40c). Multiple shoots of *A. subulatum* were cultured on the MS medium supplemented with different concentrations of cytokinins. Shoots were multiplied, rooted, hardened and planted in soil; over 1000 plants are now ready for field transfer (Fig-40d-f).

- In order to characterize different species of *Podophyllum*, 20 AFLP markers used in the study showed 88.01% polymorphism amongst the species and the paired relationship of intercontinental species in the *Podophyllum* group [*P. hexandrum*, and *P. sikkimensis* (Indian May apple)

vs. *P. peltatum* (American May apple)] appears to be paraphyletic (Fig-41). Of the 60 RAPD markers, 4 were able to clearly differentiate the species. These markers were eluted and cloned in *Eco RI* site. *Podophyllum hexandrum* germplasm collected from Kullu, showed high amount of podophyllotoxin (1.5%) as compared to *P. sikkimensis* (0.336%).

B. 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 have received wide popularity and played a catalytic role in capacity building of the user groups on the utility of various rural technologies, either introduced (and locally modified) or developed by the Institute. A total of 30 on-site training, capacity building and awareness programmes were conducted for various stakeholders at HQs and Triyuginarayan. More than half (53%) training/awareness programmes were for farmers/officials selected by Govt. organizations, 21% for NGOs, 15% for students, and 11% were in relation to institute programmes. A total of 933 persons (285 female, 648 male farmers) from 11 districts and 161 villages under this initiative in the reporting period (Table-56).
- The capacity building programme at Triyuginarayan has made significant contribution in the field of off-season vegetable cultivation and bioprospecting of wild bioresources. More than 170 progressive farmers of 15 villages have started off-season vegetable cultivation using low cost polyhouses. The economic

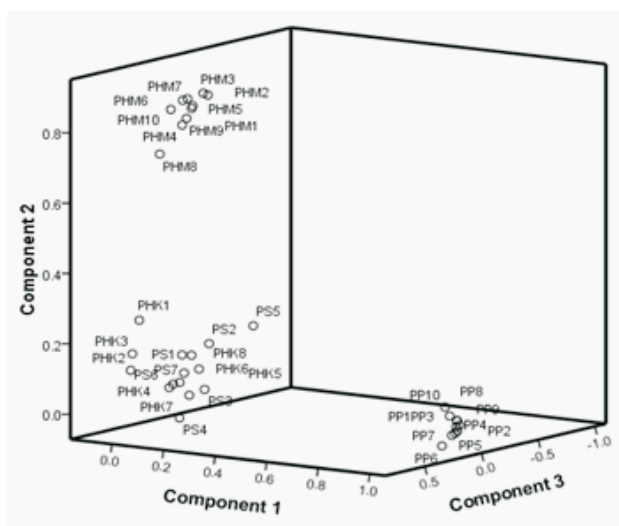


Fig-41. Principle component analysis (PCA) amongst 35 genotypes of three species of *Podophyllum*. PP1-10 (*P. peltatum*), PHM1-10 (*P. hexandrum*-Munsiyari genotypes, Uttarakhand), PHK1-8 (*P. hexandrum*-Kullu genotypes, Himachal Pradesh), PS1-7 (*P. sikkimensis*).

Table-56. Training organized for different users

Users	Total	Male	Female
Farmers selected by Govt. organizations	319	272	47
Farmers selected by NGOs	144	72	72
Institute programme	352	225	127
Students	118	79	39
Total	933	648	285
Districts covered	11		
Villages covered	161		

benefits by selling vegetables during the period 2009-12 have increased many fold. Similarly, more than 96 youth/people of about 7 villages have adopted value addition practices for wild bioresources and their income has been increased significantly, while selling the eco-tourism related products in the local market.

- Promotion of livelihoods have been achieved through large scale plantation of horticultural crops by bringing in more than 60 ha of land under plantation of large

cardamom (*Amomum subulatum*), and another 15 ha of land under orange (*Citrus reticulata*) and kiwi (*Actinidia deliciosa*) by the communities in Arunachal Pradesh.

- Towards certification of the raw material of medicinal plants grown by the farmers and local producers of the area, a quality assurance laboratory has been established. In the initial phase prioritized medicinal plants of Uttarakhand will be taken up for developing chemical profiles.

Table-57. Cost-benefit analysis of wild herbal spices.

Plant species	Input (Rs/kg)		Output (Rs/kg)	
	Cost of raw materials	Other expenditure (grinding/ packing & labour)	Cost of local value added spices	Net return after value addition at the local level
Allium stracheyi	210+5.7	30+2.2	470+11.6	230+6.1
Allium humile	230+7.7	40+2.9	500+13.2	230+8.3
Allium rubellium	230+6.4	40+1.8	500+15.3	230+8.3
Angelica glauca	300+16.1	40+3.2	550+22.6	210+5.1
Pleurospermum angelicoides	300+14.6	40+2.1	560+23.7	210+7.2
Rheum emodi	300+14.6	50+3.8	560+23.7	210+7.2
Carum carvi	250+14.6	40+4.7	500+23.7	210+7.2
Cinnamomum tamala	35+0.9	30+1.2	150+10.6	85+2.2

- Under the demonstration programme spices from local areas and plants were developed and their cost-benefit analysis after value addition revealed that various products made from about 7 plant species provide higher economic returns and could be a good source of economic upliftment in rural areas of higher altitudes (Table-57).
- Institute has also strengthened facilities of physico-chemical, biological, heavy metal analyses of drinking water, raw & waste

water, and the quantification of volatile compounds of soil and plant samples. The heavy metals in the water and soil samples have been detected through Atomic Absorption Spectrophotometer (Make-Varian AA280Z, equipped with graphite tube atomizer). For the quantification of aromatic and volatile compounds, institute has facility for gas chromatography (make- Chemito, Ceres 800⁺). Institute is also having the facility of detection

Progress of R&D Activities

Prioritized R&D activities			
R & D Themes	Research	Demonstration	Dissemination
Environmental Status Assessment and Monitoring	<ul style="list-style-type: none"> • Land and water resources assessment, monitoring of climate sensitive areas • Studies on dynamics of sensitive biodiversity elements (species/ habitats) • Impact of development initiatives on natural systems • Resource-use surveys for rural planning • Documentation of IKS and database development 	<ul style="list-style-type: none"> • Eco-Restoration and conservation • Arboretum, herbal gardens, multipleuse garden and Vriksh Vatika 	<ul style="list-style-type: none"> • Capacity building/ skill development • Networking
Environmental Conservation and Management	<ul style="list-style-type: none"> • Strengthening conservation of priority areas/species • Eco-restoration of degraded sites/areas • Factors and processes for mountain hazard management • Microbial diversity, potential application & culture collections 	<ul style="list-style-type: none"> • Livelihood options • Testing/development of IHR specific technologies 	<ul style="list-style-type: none"> • Publications / documentation
Developmental options/ strategies/ plans	<ul style="list-style-type: none"> • Resource management interventions • Propagation of economically important plants • IERP for IHR 		

Table-58. The core competence / services available with GBPIHED

Competence	Services
<ul style="list-style-type: none"> Village Environment Action Plan (VEAP) 	<i>Laboratory Analysis</i>
<ul style="list-style-type: none"> Natural Resource Assessment & Management 	<ul style="list-style-type: none"> Plant, soil, water and air quality Meteorological data analysis Biochemical investigations on medicinal/edible plants Microbiological and biotechnological experimentation
<ul style="list-style-type: none"> Water Resource Conservation 	<i>Capacity Building</i>
<ul style="list-style-type: none"> Biodiversity Characterization and Monitoring 	<ul style="list-style-type: none"> Natural resource management Nature protection and conservation education RS/GIS training
<ul style="list-style-type: none"> Documentation of IKS 	<ul style="list-style-type: none"> Training on low-cost rural technologies Disaster management
<ul style="list-style-type: none"> Environmental Physiology and Plant Adaptation 	<ul style="list-style-type: none"> Doctoral/Masters and Graduate level dissertations
<ul style="list-style-type: none"> Biotechnological and Microbiological Applications 	<i>Consultancies</i>
<ul style="list-style-type: none"> Environmental Impact Assessment & Environmental Management Plans 	<ul style="list-style-type: none"> Water resource management – catchment area protection Hydropower - EIA/EMP
<ul style="list-style-type: none"> Wasteland Development/ Restoration 	<ul style="list-style-type: none"> Project formulation on bioresources Watershed management strategies
<ul style="list-style-type: none"> Resource Mapping for Rural Planning and Management 	<ul style="list-style-type: none"> Environmental guidelines and monitoring plans for watershed management Landscape planning for mountain risk engineering
<ul style="list-style-type: none"> Institutional Networking 	<ul style="list-style-type: none"> Biodiversity assessment and Monitoring Impact of agricultural diversification
<ul style="list-style-type: none"> Resource Mapping for Rural Planning and Management 	<i>Other Services</i>
<ul style="list-style-type: none"> Institutional Networking 	<ul style="list-style-type: none"> Gene bank and identification of plants Know how for propagation of elite planting material of selected herbs & multi-purpose trees (MPTs)
	<ul style="list-style-type: none"> Library & Information, and dissemination through books, journals, periodicals, etc.

of C, H, N & S through CHNS-O analyzer (make- Elementar, Vario EL-III) and UV-Vis spectrophotometer (make- UV 5704, Electronics corporation of India Ltd.) for soil, water & plant analysis. The Institute has extended these services to other organizations (NGO's and other Government Organization) on payment basis.

- Based on the participatory discussion, training manuals on various technology packages have been 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.
- Based on the competence gained over the years on different aspects of mountain-specific environment and development issues, the Institute is equipped to extend services in diverse sectors; some of the areas have been given in Table-__.

Forestry Research

Introduction

Research & Training Division (RT) is a nodal division for two major central sector plan schemes namely "Grants-in-Aid to Forestry & Wildlife Sector" and "Capacity Building in Forestry Sector". This division looks after the administrative, financial and other matters of four research & training institutions viz. Indira Gandhi National Forest Academy

(IGNFA), Dehradun, Indian Plywood Research and Training Institute (IPIRTI)- Bengaluru, Indian Institute of Forest Management (IIFM)- Bhopal, Indian Council of Forestry Research & Education (ICFRE)- Dehradun. The scheme of Capacity Building includes training of members of Indian Forest Service, State Forest Service, Range officers, Forest Guard etc. Awareness program through short term training/workshops/study tours for personnel of various departments such as police, revenue, custom, agriculture, etc. are also one of the component of the capacity building scheme. Training of other stakeholders like Panchayat Members, elected representatives, teachers, social activist, NGOs, and Media personnel is also arranged by various institutions under the capacity building schemes. The RT- Division is also implementing externally aided project on "Capacity Development for Forest Management & Training of Personnel (IDP.199)".

Following two umbrella schemes are being implemented by RT division through various institutions/ organisations.

Grants in aid to Forestry & Wildlife Institutions

This scheme is a merged scheme of four ongoing central sector "Grants-in-Aid Schemes" of Ministry of Environment and Forests. The individual schemes of 10th Five Year Plan which have been merged include:

- Grants-in-aid to Indian Council of Forestry Research & Education (ICFRE), Dehradun.
- Grants-in-aid to Indian Institute of Forest Management (IIFM), Bhopal
- Grants-in-aid to Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru.

Indian Council of Forestry Research & 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 research through need based planning, promoting, conducting and coordinating research, education and extension 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 the ability of forest managers and researchers to successfully handle challenges related to natural resources management. The council also imparts forestry education through Forest Research Institute (FRI), a Deemed University, supports forestry education in Agricultural Universities and organize training programmes for the personnel of the State Forest Departments and other stakeholders in the field of forestry and allied sectors.

Evaluation of the Scheme: Indian Council of Forestry Research and Education (ICFRE) has eight Regional Research Institutes and four Research Centers located in different biogeographical 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

Indian Institute of Forest Management (IIFM), Bhopal

Established in 1982 as an Autonomous Institution under the Ministry of Environment & Forests, Govt. Of India, the IIFM was conceptualised in response to recommendations of National Commission on Agriculture (1972). Further in 1974, Govt. of India accepted the recommendations of Food and Agriculture Organization of the United Nations and Swedish International Development Agency. Besides, emphasis on renewable national resource system under Business Management was also suggested by Ford Foundation. All this necessitated the creation of Autonomous Institute to provide a formal identity in the field of Management Education in Forest & Allied Sectors.

Recognizing the need, Government of India entered into agreement with Indian Institute of Management, Ahmadabad, to

share the responsibility of establishing an independent and Autonomous Institute. The impetus generated by the recommendations culminated in an alliance with the Indian Institute of Management, Ahmadabad (IIMA) with the establishment of programme office at Indian Institute of Management (IIM), Ahmadabad during 1978 – 1981. The first, Ten Years Perspective Plan (1981 to 1991) of IIFM was prepared by IIM Ahmadabad. In August 1981 the programme office was shifted at Bhopal and IIFM Society was registered on 15th January 1982. The current/second perspective plan (2006-2016) of IIFM is under implementation and gives tremendous thrust on increased research, expansion of educational programmes, increased national and international linkages along with supporting infrastructure and resource base for effective implementation.

Since its establishment, in 1982 as an autonomous institution of the Ministry of Environment & Forests, the Institute has developed as an educational, research, training and consultancy organisation at national as well as international level. The IIFM aims to provide leadership in professional forestry management aimed at environmental conservation and sustainable development of Ecosystems. This institute is also trying to be among the leading international institutions in the area of forest and related environment development management and be respected, both nationally as well as internationally, for its outstanding contributions in the field of education, training, research, consultancy, and thought leadership.

The Institute, as a sectoral management institute, imparts education in forest management, which is a judicious combination of management, social, and forestry sciences.

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 forest management and ensures proper integration of external and indigenous knowledge suitable to Indian context. The specific objectives of the Institute are:

In consideration of the major objectives, the vision of the Institute has been translated into the following mission statement:-

- To serve different stakeholders of forestry, environment, and Development sectors and the society, in general, through development and dissemination of knowledge, human resource development through its education and training activities, and providing assistance in formulation and advocacy of relevant policies and strategies,
- To be a national institution with international perspective and outreach, and
- To build culture of excellence, achievement, cooperation and service within a framework of strong ethical patterns of behavior informed by universal values.

Indian Plywood Industries Research & Training Institute (IPIRTI), Bengaluru

IPIRTI was established for undertaking research and development of technologies for plywood and panel products made from wood and other lignocellulosic materials including plantation timber, bamboo and other natural fibres. The technologies developed have been made available to the forest based industries (mostly plywood manufacturing units) and other stakeholders. Institute is also responsible for providing training to meet human resource

7

development needs for plywood and other allied industries. IPIRTI is also a recognized Institute from Bureau of Indian Standards (BIS) for undertaking testing and formulating standards related to wood based panel products.

Capacity Building in Forestry Sector

It is a Central Sector Scheme formulated by merger of different existing, Central Sector Forestry Training Schemes into a single Scheme with additional components. The Planning Commission approved the merger proposal in principle at an outlay of ₹110.00 crores for the Eleventh Five Year Plan and Cabinet Committee on Economic Affairs (CCEA) approved the scheme along with additional Externally Aided Projects (EAP) component of ₹225.00 Crore from Japanese International Cooperation Agency.

Training of IFS Officers

This scheme is for capacity building of Indian Forest Service (IFS) officers through sponsoring of short-term refresher courses of one/two week(s) duration in the premier institutions in the country for keeping them up to date on latest technologies, new ideas and change of the attitude for managing the natural resources of the country. The institutes organize specialized tailor-made courses on various topics/themes as decided by the Ministry of Environment and Forests (MoEF). The courses cover a wide range of topics relating to management and administration of forests, wildlife and environment and general administration in the government. The topics include human resource development, financial management including micro-financing, environmental impact assessment & auditing, joint forest management, intellectual property rights issues in forestry, policy and legal issues,

good governance, managing of non-timber forest products for addressing livelihood concerns of local communities, effective leadership and conflict resolution, impact of global warming and climate change on forests and biodiversity, geographical information system – a decision tool for forestry planning and management, captive management of wild animals, eco-tourism assessment and development, economics of conservation areas, enhancing the effectiveness for implementation of government policies and programmes, wildlife management – issues, concerns and practices, eco-tourism – strategies for success, learning lessons from externally aided projects, conservation and development of medicinal plants, natural resources accounting, bamboo resource development for livelihood generation for tribal and rural communities, role of forestry in conservation, development and management of water resources, role of agro-forestry in increasing tree cover etc. Besides this, IFS officers are also sponsored to pursue long-term training courses in the areas of interest offered by premier institutions of the country.

In addition to sponsoring short-term refresher courses for the IFS officers, it is proposed to continue sponsoring 1-3 day training workshops and seminars for the IFS officers on emerging topics of regional, national and international importance like professionalizing the forestry service, water conservation, training curricula and effectiveness review, forest invasive species, bio-prospecting, interventions required for scientific management of Non-Timber Forest Produces (NTFPs) and livelihood concerns of local communities, changing needs of forestry administration and management etc. The training workshops/seminars will be sponsored in the premier institutions/organization in the

country depending upon their expertise in a particular field/discipline.

Indira Gandhi National Forest Academy (IGNFA), Dehradun

IGNFA was constituted in the year 1987 by renaming the erstwhile Indian Forest College vide Ministry of Environment and Forest order No. 1-6/87-RT dated 25.05.87. This Academy is engaged in imparting induction training to IFS (Probationers) and in service training of one week/two week/three weeks to the in-service officers. Academy has also started professional skills upgradation training for the officers promoted to Indian Forest Services from State Forest Service (SFS) and officers of other services including judiciary. Brief objective/activities of the Academy are as under:

- Conducting initial training of IFS probationers extended over a period of three years (changed to two years from 2005).
- Organizing Professional skill upgradation training programme for officers of SFS promoted into IFS.
- Conducting compulsory course for in service IFS officers at middle/senior level.
- Organizing thematic seminar/workshop on relevant sectoral issues.
- Conducting Advanced Forest Management Courses for in service officers with 10, 17 and 21 years of service in IFS.
- Organizing Senior Foresters Workshop for senior IFS Officers of 50 years (retired foresters) and 30 years of service.
- Conducting Mid Career Training Programme for IFS officers of 7-9(Phase-III), 16-18(Phase-IV) and 26-28 years (Phase-V) of service.

State Forest Service and Ranger's College

The Directorate of Forest Education, a subordinate office directly under the Ministry of Environment and Forests has been involved in capacity building of forestry personnel of the states and union territories in the country other than IFS since 1991. The forestry training institutes under the direct administrative control of the Directorate of Forest Education are:

- Central Academy for State Forest Service, Dehradun (Uttarakhand)
- Central Academy for State Forest Service, Coimbatore (Tamil Nadu)
- Central Academy for State Forest Service, Burnihat (Assam)
- Eastern Forest Rangers College, Kurseong (West Bengal)

The mandate of the Directorate of Forests Education is :

- To ensure 'Standard and quality' of training being imparted to the forestry personnel of all levels other than Indian Forest Service personnel.
- To help develop 'Capacity and Infrastructure' of desired standard for training of various levels of personnel in forestry sector other than IFS.
- To assist develop appropriate and relevant training modules/ content/evaluation formats for forestry training at various levels of personnel.
- To sensitize the stakeholders about forestry and forest conservation through conducting custom made training modules.
- To assist Government of India and State Governments to develop training policy for efficient human resource

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- management and development.
- To assess the 'Changing Training Needs' of forestry personnel for quality and standard training.
 - To ensure a pool of professionally competent and qualified Forestry Personnel.

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. The trainings can be organized at two levels one for the senior officers (Group A/class I) at IGNTA/Lal Bahadur Shastri National Academy of Administration (LBSNAA)/WII/Customs Academy or any other reputed training institute and the other one for the class II/class III state level officers at the State ATIs/Forest Training Institutes (Regional) and institutions under ICFRE etc. For participation in these courses, a provision has been kept for meeting expenses on TA/DA in the budget proposals.

Foreign Training of Forestry Personnel

Present-day foresters have to deal with non-technical issues e.g. inter-sectoral policy and programme linkages. 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 and SFS Officers and also for providing opportunities to them (including the Forest Range Officers (FROs) for participating in international seminars, workshops and study tours abroad on emerging issues and challenges in forestry sector is therefore, proposed.

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 the people from developing a sense of belonging to the forests. There is a need to sensitize other 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.

Capacity Development for Forest Management and Training of Personnel

It is a Central Scheme (in a project mode) to be implemented with the assistance of a

loan component to be provided by the JBIC as reimbursement.

The scheme is not location specific and is intended to be implemented, gradually, in all the States/UTs of the country. However, in the first phase, due to limited project money, JBIC and MoEF have decided to limit the coverage of the scheme in the following Twelve States:

- Assam
- Bihar
- Chhattisgarh
- Jharkhand
- Kerala
- Madhya Pradesh
- Maharashtra
- Uttarakhand

- West Bengal
- Mizoram
- Arunachal Pradesh
- Nagaland

The project is for the human resource development of forestry personnel and the infrastructure development to meet these human resource development needs. As such the output of the project is going to be in the form of (i) infrastructural up-gradation/creation of new infrastructure for the forestry training schools/institutes of the country and (ii) enhanced output of the training schools/institutes, quantitatively by the number of trainees trained and qualitatively, by the quality of training inputs. The estimated physical targets for (i) & (ii) are given in Table-_. 7

Table-59. Estimated Physical Targets

Items	Activities	Physical targets
(i) Infrastructural upgradation/creation of new infrastructure (Rehabilitation of Training Institutes/Schools)	<ul style="list-style-type: none"> • Rehabilitation of Training Institutes/Schools of target states. • Improvement of Infrastructure of SFSC (Central Academy for State Forest Services - CASFOS) Dehradun. 	<ul style="list-style-type: none"> • No of State Forest Training Institutes (SFTIs) to be rehabilitated: 27 No of STIS to be newly constructed: 3. • One
(ii) Activities for Strengthening of Training System.		
(a) Qualitative inputs	<ul style="list-style-type: none"> • Creation of Steering Committee and Project Monitoring Unit (PMU). • Revision of Training Guidelines. • Preparation of sample course materials and teaching notes. 	<ul style="list-style-type: none"> • One each. • National-1 State- 10. • State-20.
(b) Qualitative yield (improved).	<ul style="list-style-type: none"> • Master Trainers (MT) Training. • Training of Trainer (TOT). • Training for Field Staffs (TOF). 	<ul style="list-style-type: none"> • 40 (MTs). • 100 trainers. • 1500 trainees/year.

The RT-Division is implementing externally aided project on "Capacity Development For Forest Management & Training of Personnel (IDP.199)". During last one year-

- Capacity freezing for trainees of frontline staff done for 11 states and 20 existing and 2 new State Forestry Training Institutes. Nagaland has been included as 12th state in the project and capacity has been frozen.
- Detailed Project Reports (DPRs) of 18 existing SFTIs have been sanctioned and 80% of the sanctioned amount transferred to SFDA's of concerned states. DPRs of 2 new SFTIs (one for Bihar and one for WB) are under consideration in the Ministry.
- 50 Potential Master Trainers (PMT) from 11 participating states (Arunachal Pradesh, Assam, Bihar, Chhatisgarh, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Uttarakhand and West Bengal) and Sikkim (included only for soft component) are identified from the originally nominated more than 100 officers from state cadres
- Out of 50 PMTs, 41 PMTs from 11 States and Sikkim are given intensive training on Training Methodologies who will in turn conduct Training of Trainers (ToTs) for faculties of SFTIs of their respective states
- Each PMT prepared Lesson Plans for 2 Lecture Hours on forestry subjects of syllabus for frontline staff
- National level consultants are in position and State Level Consultants are in place in Kerala, Maharashtra and MP already and under process in rest of the states.
- Renovation /new construction are in progress at Kerala, Maharashtra, Andhra Pradesh, Assam, MP etc.

- National Training Guidelines for frontline staff are under revision.

The plan for the next six month include following activities-

- Completing 2 DPRs and their approval expeditiously and Visit to Nagaland for guiding the DPR preparation
- Inclusion of Himachal Pradesh and Goa after due formalities
- Persuading remaining States to engage their State Consultants
- Conducting ToT in 11 States and Sikkim and Conducting new MT Development Program for new states and left out PMTs
- Monitoring of project activities in states.

Indian Council of Forestry Research and Education (ICFRE), Dehradun

Introduction

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 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 their applications
- 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

Progress/achievements made during 2012-13

New initiatives

- ICFRE revisited its thrust areas to make research people-centric, primarily focusing on the livelihoods of the rural tribal population, along with a focus on food and water security. Six thrust areas and 35 themes were identified. The new thrust areas are the following:
 - Thrust Area 1: Managing Forests and Forests Products for Livelihood Support and Economic Growth
 - Thrust Area 2: Biodiversity Conservation and Ecological Security
 - Thrust Area 3: Forests and Climate Change
 - Thrust Area 4: Forest Genetic Resource Management and Tree Improvement

- Thrust Area 5: Forestry Education and Policy Research to Meet Emerging Challenges
- Thrust Area 6: Forestry Extension for Taking Research to People
- National Project Directors (NPDs) have been nominated in all six thrust areas to oversee the implementation and execution of national programmes.
- Projects in the form of All India Coordinated Projects (AICPs), inter-institutional projects and networked projects, where scientist of all the ICFRE institutes will work together to achieve common goals by pooling resources, have been envisaged and implemented.
- The Council restructured the erstwhile Project Formulation Division into the Panchayat and Human Dimensions Division, headed by an officer of ADG rank, for broadening its activities by having an interface with Panchayat Raj institutions in the country with a special focus on developing a baseline of forest and non-forest land use practices. Work in this direction is going on in 275 districts of the country.
- A new innovative scheme, "Direct to Consumer", for quick transfer of technologies to consumers/stakeholders on completion of research projects has been launched by the ICFRE so that the end users can get immediate benefits from the research findings. Seventeen projects from various institutes of the ICFRE have been identified for extension under the Direct to Consumer scheme.
- The composition of Forest Types of India in the field have changed a lot since last revision in 1969. Their revision was

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- long overdue. ICFRE constituted a task force to prepare a change matrix of forest vegetation in the country. All the institutes of the ICFRE are involved in this massive national-level exercise. The task is almost complete and the outcomes will be published in due course. This monumental work will be beneficial for the policy makers, field foresters, forest managers and researchers and would also act as a base line for the climate change negotiations.
- An all-encompassing study titled "All India Coordinated Climate Change Forestry Research Programme (AICFP-INDIA)" has been launched to assess the impacts of climate change on forest ecosystem processes and functioning.
 - All India coordinated Project under FRA, 2006 for Conservation of Biodiversity and enhancing livelihood options for Tribals and other Forest Fringe communities, at a cost of about ₹ 5 crores is being initiated. The project will focus on enhancing livelihoods through NTFPs like Honey, Tassar and Lac, Water harvesting, capacity building, growing of medicinal plants and socio economic upliftment of tribals and fringe forest dwellers.
 - ICFRE has prepared the HRD Plan for Capacity Building of Scientific Personnel for the XII Five Year Plan. The document is available at the website of ICFRE at www.icfre.org.in.
 - On the directions of Hon'ble Supreme Court of India, preparation of Reclamation and Rehabilitation Plans of the mine areas in Bellary, Tumkur and Chitradurga districts of Karnataka being carried out for which ICFRE has been awarded with a consultancy worth ₹ 14 crores by the Government of Karnataka.
 - ICFRE organized 24th Session of International Poplar Commission (IPC) and 46 meeting of its executive committee in October 2012 at Dehradun. It is for the first time that such a prestigious event of the IPC was held in India. 227 Delegates from 23 countries participated in the Session.
 - As the Research Thrust Areas have been revamped, and six thrust areas and 35 themes have been identified. National Subject Matter Coordinators (NSMCs) have been appointed for each theme, and 35 State of Knowledge Reports (SKRs) on various themes of forestry describing national and international work carried out with ICFRE contributions are under preparation.
 - Taking a further step in the directions of benefiting the farmers from the technologies/processes evolved by the Council and with a specific aim of extension of agroforestry the networking of Van Vigyan Kendras (VVKs) with Krishi Vigyan Kendras (KVKs) is in process. The ICAR has shown interest in the joint venture in a meeting held between DDG (Extension), ICFRE and DDG (Agricultural Extension), Indian Council of Agricultural Research (ICAR). Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore has already initiated networking of VVKs with KVKs.
 - Published a coffee table book "Forest Biodiversity in India" which covers various parameters of biodiversity including the hotspots, diverse forest types and drivers of change. The book has been beautifully presented with a large collection of photographs from all over India and has been praised by one and all.
- In addition, "Forest Sector Report India 2010" was published by ICFRE with



Fig-42. Smt. Jayanthi Natarajan, Hon'ble Minister of State (I/C) releasing "Forest Biodiversity in India" and "Forest Sector Report India 2010"

the funds provided by the Ministry of Environment and Forest, Government of India. The report covers six important sub sectors associated with forestry namely Forest Management and Community Participation; Conservation of Forests, Wildlife and Biodiversity; Development of Forest Resources: Schemes and Achievements; Application of Science and Technology in Management; Production and Utilization of Forest Resource and Human Resource and Capacity Building. Both the books were released by Smt. Jayanthi Natarajan, Hon'ble Minister of Environment and Forests, Government of India during COP-11, Hyderabad on 17th October 2012.

- ICFRE released a compendium "Changing Frontiers of Research Programs in ICFRE based on XIII Research Policy Committee (RPC) 2012 Meeting". This compendium is the compilation of the outcome of the new initiatives taken recently in the research planning and prioritization system and highlights the process of formulation of bringing the scattered and piece meal projects into the National Programmes as All India Coordinated Projects/ Inter institutional Projects and Networking Projects
- During the World Forest Week Event on Strengthening forestry in land use decisions, Dr. V. K. Bahuguna, Director General, ICFRE, Dehradun INDIA, chaired a session on "Strengthening forestry in land use decisions" at the COFO 2012 Meet at Rome on 25 September 2012.
- Dr. V.K. Bahuguna, DG, ICFRE has been elected unanimously Vice Chairman of Asia Pacific Association of Forestry Research Institutions (APFRI) during the Sixth General Assembly of APFRI held on 31-08-2012 at Guangzhou, China.
- The Forest Research Centre, Hyderabad has been upgraded to Institute level and renamed as Institute of Forest Bio-diversity. The Institute will focus on the biodiversity



Fig-43. Dr. V.K. Bahuguna, DG, ICFRE chaired the session at COFO 2012 Meet, Rome

of Andhra Pradesh, Maharashtra and Eastern Ghats.

- ICFRE Pensioners' Welfare Health Scheme (ICFREPHS) 2012 launched on 31st December 2012.
- ICFRE has come up with a novel concept for helping the tribals and forest based artisans through creation of *PRERNA* Souvenir Shop at ICFRE – by offering a platform for marketing their products.
- The Third Sub-Committee of Committee of Parliament on Official Language including Hon'ble Members of Parliament Prof. Alka Balram Kshatriya, Shri Hukumdev Narayan Yadav, Dr. Raghuvansh Prashad Singh and Dr. Ram Prashad visited FRI, Dehradun on 29th May 2012 and reviewed the progress in implementation of Rajbhasha Hindi in the FRI and ICFRE, Dehradun.
- Parliamentary Committee on Science and Technology, Environment & Forests visited FRI, Dehradun on 4th July 2012. Committee headed by Dr. T. Subbrammi Reddy appreciated the efforts of ICFRE in the field of forestry research, education and extension towards meeting the livelihood needs of the people living in forest fringe areas and also focusing on emerging issues of biodiversity conservation and climate

change. Chairman of the committee has written letters to the Hon'ble Prime Minister, Hon'ble Forest Minister and Chairman Planning Commission regarding the recent initiatives by ICFRE and requesting for addition allotment of budget to take forestry research to higher levels.

- To encourage young Forestry Researchers from South Asian Association for Regional Cooperation (SAARC) countries, 10 Fellowships announced by Hon'ble Prime Minister. SAARC center proposed creation of SAARC research net work to be hosted by ICFRE.
- ICFRE successfully carried out Mid Career Training on behalf of IGNFA, Dehradun for IFS officers for Phase III (Third Course), by providing best institutional arrangement and partnership with Institutions like WII, Dehradun, FSI, Dehradun, Indian Institute of Management (IIM) Ahmedabad, Colorado State University (US) and Swedish University of Agricultural Sciences (SLU) Sweden.
- One week training programme for scientists and technologists on "Climate Change and Carbon Mitigation: Mitigation and adaptation" was organized by Biodiversity

and Climate Change Division at ICFRE, Dehradun. The training programme was sponsored by the Department of Science and Technology New Delhi, and scientists and technologists from all over India participated in the training programme.

- One week training programme for scientists and technologists on "Climate Change, Forest Eco-systems and



Fig-44. Parliamentary Committee on Science and Technology, Environment & Forests at FRI, Dehradun

Biodiversity” was organized by Biodiversity and Climate Change Division at ICFRE, Dehradun. The training programme was sponsored by the Department of Science and Technology New Delhi, and scientists and technologists from all over India participated in the training programme.

- A training workshop for IFS officers on “The significance and scope of REDD/ REDD+ for Indian forest” was organized by Biodiversity and Climate Change Division at ICFRE Dehradun. The training workshop was sponsored by the Ministry of Environment and Forests, Government of India, New Delhi.

Forest Research Institute (FRI), Dehradun

Research

- Forest Research Institute (FRI), Dehradun obtained thirteen isolates of *Alternaria* species from diseased eucalyptus samples, amplified and sequenced for ITS region of nrDNA.
- Forest Research Institute (FRI), Dehradun observed that three clones of *Dalbergia sissoo* are showing resistance against *Fusarium solani* wilt disease.

Extension

- FRI, Dehradun organized a regional workshop on “Revision of National Working Plan Code” from 28th and 29th May 2012 at Kolkata. Senior Working Plan. Officers from North East states attended the workshop.
- Under ‘Direct to Consumer’ programme of ICFRE, technology developed by FRI, Dehradun for ‘Reshaping of exudates gums’ was transferred to M/s Anand Gond Udyog, Nagpur on a license fee of ₹ 1.4 Lakhs.

Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore

Research

- Root rot disease on *Melia dubia* caused by *Fusarium* sp. was recorded for the first time in 6-months old plantation in Chennimalai, Tamil Nadu.
- Six bacterial isolates were isolated and identified from textile dye effluents. Assessed the efficacy of all these bacterial isolates for heavy metal degradation and it was observed that most of the isolates were able to degrade the textile dye effluents and maximum degradation was observed by *Bacillus* sp. under *in vitro*.
- Leaf blight disease on *Gmelina arborea* caused by species of *Alternaria*, *Cuvularia* and *Colletotrichum* were recorded for the first time in SFD Research Nurseries at Villupuram and Dindugal, Tamil Nadu.
- 55 PGPR isolates were isolated from 12 contaminated soil samples and it was pure cultured and maintained in nutrient agar slants for further studies under *in vitro*.
- Three full length CDS sequences from *E. tereticornis* were submitted to NCBI.
- IFGTB, Coimbatore currently making efforts to develop organic biobooster from plant based products. The use of biobooster which are highly safe and act as induced plant defenses. It is observed that Coir pith with Farmyard manure and effluent compost influence the better growth *Casuarina junghuhniana* seedlings raised in different treatments viz. Coir pith with Farm Yard manure, Effluent compost, Vermiculite, green manure in nursery. The results were confirmed after 30 days of observations.

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Extension

- IFGTB, Coimbatore organized a five day refresher training programme for the Indian Forest Service officers on "Forest Genetic Resource Management" from 10th to 14th September 2012, sponsored by the Ministry of Environment and Forests, Govt. of India. A total of 25 IFS officers participated in the training programme.
- IFGTB, Coimbatore organized an "Awareness Training Workshop on The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)" on 30th and 31st August 2012 for various agencies involved in CITES implementation in South India. About 42 participants from various State Forest Departments, Customs and Excise, Police, Directorate of Revenue Intelligence and Forestry Research Institutes had attended the training.
- IFGTB, Coimbatore organized a stakeholders meeting on Validation of Descriptors of Casuarinas and Eucalyptus on 15th June 2012 with the funding support of the PPVFR Authority to complete the validation process of the draft DUS guidelines.
- IFGTB, Coimbatore through a national consultative process has brought out the country report on the state of Forest

Genetic Resources (FGR). This report was released by Smt. Jayanthi Natarajan, Hon'ble Minister of State (Independent Charge), Environment and Forests, at Chennai on 22nd December 2012.

Institute of Wood Science and Technology (IWST), Bengaluru

Research

- Institute of Wood Science and Technology (IWST), Bengaluru started nursery activities for raising of sandal QPM at Nagroor Nursery. Total 33 kgs of sandal seeds were sown in 4 sand beds (1 mx10m) after treatment. Seeds are germinating. Root trainers are being filled with potting mixture for producing 60,000 seedlings.

Extension

- Institute of Wood Science and Technology (IWST), Bengaluru organized workshop on Wood & Engineered Wood Working Units under "Design Clinic Scheme" with the sponsorship of National Institute of Design (NID-MSME) from 10th to 14th September 2012.
- IWST, Bengaluru organized 'Two Technology Marketing Meets' for prospective buyers of IWST technologies on 5th December 2012 (Technologies demonstrated - Wood Polymer composite: new age material, Sap displacement technique for treating small girth timber and bamboo, Improved utilization of lesser known and plantation grown timbers from South India and Treated catamarans : a boon to fishermen) and on 14th December 2012 (Technologies demonstrated - Portable distillation unit to extract essential oils, Package of practices for raising quality stock of sandalwood, Macropropagation technique for raising



Fig-45. Smt. Jayanthi Natarajan, Hon'ble Minister of State (I/C) releasing the country report on the State of Forest Genetic Resources

Dendrocalamus stocksii, Development of Metarhizium based mycoinsecticide (PETSTAT) for management of forest pests, Ecofriendly AM fungi in forestry to get good planting) at IWST, Bengaluru. The scientists of the institute explained/demonstrated about the technologies developed by the institute. About 11 business men/women attended the meeting on 5th December 2012 and 19 business men/women attended the meeting on 14th December 2012.

Tropical Forest Research Institute (TFRI), Jabalpur

- Organized two training programme on collection value addition and marketing of Non-timber forest products is organized from 17th to 21st & 24th to 28th September 2012 for the members of Rajiv Gandhi Mission for watershed management.
- Organized one day workshop on 'Strengthening Network for Outreach of Research Findings' on 30th November 2012 to extend the research findings of TFRI, Jabalpur and other ICFRE Institutes. Research findings of various technologies were disseminated to forest department, NGOs, SHGs and others. Technologies include, *Sustainable harvesting of Arjuna Bark, Integrated Pest Management of white grubs in forest nurseries, Biological control of insect pest of teak in plantations, Teak-turmeric silvi-medicinal system, Draught type drum dryer techniques of drying seeds of important Non Wood Forest species, Tree species suitable for different stress sites (viz. water logged, Bhata land and Mine overburden sites etc.) in central India, VAM and Azospirillum production techniques for teak stump production, Micro-propagation of R. serpentine, Development of a Metarhizium based Mycoinsecticide (peststat) for management of forest pests, Biopesticide product – Vilvekam – Agle marmelos seed oil based bio-pesticide, Micro-catchment for plantation establishment and Apparatus for preservative treatment of bamboos.*

Rain Forest Research Institute (RFRI), Jorhat

- Trap culture of elite strains of entophytes collected from 3 samples i.e. AMS/RM-19, AMS/PH- 20 & AMS/PH-21 has been initiated and sub culturing of some useful rhizospheric bacteria and fungi is under progress.
- During the field survey at Mokokchung, Nagaland 62 species of mushroom were collected. Out of these following 16 species were identified *Hebeloma pusillum, Delicatula integrella, Diplomitoporus flavescens, Geoglossum cookeianum, Hemimycena lacteal, Marasmiellus candidus, Marasmiellus vaillantii, Ramaria acrisiccescens, Coprinus silvaticus, Scutellinia scutellata, Cyathus striatus, Xylaria longipes, Lentinus bertieri, Coprinus disseminates, Armillaria tabescens and Galerina autumnalis.*
- A species of pathogenic bacteria *Bacillus* sp. was detected from the naturally infected cadavers of *Pyrausta coclesalis* Wlk. a major defoliator of *Bambusa tulda* and *B. balcooa*. Laboratory evaluation of the pathogenic bacteria revealed that 2.6×10^8 CFU/ml was found to be effective on the host as well on other important bamboo leaf roller *Crocidophora* sp. The record of this native pathogenic bacteria on the host *P. coclesalis* was found to be a new record.

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Arid Forest Research Institute (AFRI), Jodhpur

- Studies on carbon sequestration in different forest types of Rajasthan was conducted. Jhalawar, Bundi, Karauli, Sawaimadhopur, Jodhpur and Kota Forest Division were surveyed where dominant forest types are *Anogeissus pendula*, *Acacia catechu* and *Boswellia serrata*. In the forests of these divisions, soil organic carbon stock in 0-90 cm soil layer ranged from 41.5 tone ha⁻¹ in Kota to 18.3 tone ha⁻¹ in Jhalawar. Soil inorganic carbon ranged from 57.72 tones ha⁻¹ in Karauli to 2.9 tonnes ha⁻¹ in Bundi forests.
- DNA extraction and purification protocol for mapping genetic diversity of *Prosopis cineraria* was optimized.
- *In vitro* rooting was achieved in microshoots of *Hardwickia binata*.
- Under the study 'Enhancing productivity of saline wastelands in Ran Of Kuchch', the *S. persica* proved to be best species amongst *A. bivenosa*, *Acacia ampliceps* with 83.7% mean survival after 50 months under the extremely harsh conditions of high salinity, heat stress. Treatments improved the growth; height, crown and collar diameter after 50 months. Results after 50 months indicate that *S. persica*, *A. bivenosa* and *A. ampliceps* have the potential to revegetate the bare highly saline black silty soils. They maintain good survival, attained significantly higher growth than sandy soils. Management practices enhanced the growth of all the three species.
- Under the study 'Induction of systemic acquired resistance in rohida (*Tecomella undulata* (Sm.) Seem.) against stem canker', the isolates of fungus had been identified by IMTECH Chandigarh as *Chrysosporium*

eratinophilum and *Paecilomyces variotii*.

- Improved rooting without application of growth regulators in *Commiphora weightii*.
- *Ganoderma lucidum* inoculum has been inoculated in the khejri saplings and symptoms of top dying were recorded after 3 weeks of inoculation.

Himalayan Forest Research Institute (HFRI), Shimla

- This institute was awarded a consultancy titled, "Redrafting of Catchment Area Treatment Plan for Shongtong-Karchham Hydroelectric Project" by Himachal Pradesh Power Corporation Limited, Shimla to the tune of ₹ 5.60 Lakhs.
- The institute organized two days training and demonstration programme on 'Cultivation of Important Temperate Medicinal Plants - An Option for Diversification and Additional Income for Farmers' at Wildlife Interpretation Centre, Manali, District Kullu (HP) on 18th and 19th November 2012 and a one day training programme on "Nursery Techniques of Atish and Chora - important temperate Medicinal Plants" at village Khatnol of Distt. Shimla (HP) on 25th November 2012 to develop specific skills of the targeted farmers. About 25 participants attended the same.

Institute of Forest Productivity, Ranchi

- The institute participated in 17th Year Rural Exhibition-cum-Fair "Sunderban Kristi Mela O Loko Sanskriti Utsab" organized by Kultali Milon Tirtha Society, Vill. Kultali, P.O. - Narayantala, P.S.- Basanti, Dist - 24 Pgs (S). West Bengal - 743329 from 20th to 29th December, 2012 at Kultali Milon Tirtha Society Campus. Many Central &

State Government Departments displayed their stall. Among 23 Central Government stalls, the stall of IFP, Ranchi received big appreciation and got 4th prize in terms of their livelihood generation.

- Thrust areas in research have been revised. Studies were conducted on the Forest Types of India. A new innovative scheme 'Direct to Consumers' has been launched with a view to deliver the outcomes of the research projects to the stakeholders. For broadening its activities by having an interface with Panchayat Raj institutions in the country, a new Division, 'Panchayat and Human Dimensions Division' has been created.

Activities including publication of literature, training and exposition, setting up model nursery etc. have been undertaken in Van Vigyan Kendras. Besides, the regular activities, Initiatives have been taken towards the networking of VVKs with KVKs of ICAR.

Budget allocation and Progress of expenditure during 2012-13

Budget Component	Budget allocation by MoEF for 2012-13 (Rs. in crore)	Progress of Expenditure upto
Plan	134.50 (RE)	72.0
Non-Plan	25.97	19.48

Empowerment of women/ weaker sections matters

- A comprehensive Agroforestry Project titled, "Samudai Adharit Samanvit Van Prabandhan Evam Sanrakshan Yojana in Bihar State" commonly known as Bihar Project being implemented by ICFRE in collaboration with Environment and

Forest Department of Bihar State. Presently, Phase-I of this project approved for ₹51.00 crores by Planning Commission (ICFRE share-₹18.94 crores, Bihar SFD share-₹32.06 crores) is being implemented. Under Phase-I, ICFRE is undertaking Poplar based Agroforestry Programme in Vaishali District in North Bihar by providing technical know-how, training and extension, raising quality planting stock, establishment of model / high – tech nurseries, kisan nurseries, demonstration plots and clonal seed orchards etc. Till now 78000 plants have been distributed under the project.

- Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore organized an awareness meeting on "Sexual harassment of Women at workplace (Prevention, Prohibition and Redressal) Bill, 2012" by the Internal Complaints Committee, IFGTB on 1st October 2012. The meeting was organized to spread awareness on the Bill which was recently passed by the Lok Sabha on 3rd September 2012.
- IFGTB, Coimbatore and KVK, Villupuram organized the interactive meet of Tree Growers and distribution of casuarina seedlings developed by IFGTB for the Thane Cyclone affected farmers organized under Networking of VVK and KVK at Krishi Vigyan Kendra, Villupuram located at Tindivanam, Tamil Nadu on 10th December 2012.
- Socio-economic survey work was carried out in 61 villages of Pali district & ecological survey conducted in forest fringe areas of 21 villages. It was observed that forest fringe area in Pali is dominated by Meena, Bhil and Gharasia tribes. *Euphorbia caducifolia* and *Prosopis cineraria* were found as dominant forest types in forest areas of Manpur

and Ghanaroo villages. In the outskirts of Ghanti and Dhurasni village dense forest of *Prosopis juliflora* was observed. Mixed forest of *P. Juliflora*, *Cassia tora*, *Capparis Deciduas*, *Anogeissus pendula*, *Calotropis procera*, *Argemone Mexicana* were found in Wandar, Magartalab, Lolawas and Bariyala villages. However, in some of the villages like Berkalan, Mandigarh density of vegetations were very sparse to almost nil.

- FRI, Dehradun organized a 5 days' specialized training on "Bamboo, Ringal and Grass based Jewellery making" for 26 farmers/ Artisans of Uttarakhand at FRI, Dehradun from 18th to 22nd June 2012.
- Institute of Forest Productivity (IFP), Ranchi organised training programme on "Lac cultivation through scientific method in kusum trees" to the farmers at Gutuhatu of Khunti district on 26th June 2012 to the farmers at Kurdapurti, 3rd July 2012 wherein 36 farmers participated.
- Institute of Forest Productivity (IFP), Ranchi organized three days training on "Scientific Methods of Lac Cultivation" on 17th to 19th August 2012. Different aspects of Lac cultivation including Pruning, Host Management, Quality of Brood lac, Inoculation, Pest control, Harvesting, Lac Cultivation on *Flemengia Semialata* were covered in the training. The institute in 1st phase distributed 2000 *Flemengia Semialata* plants on 30th August 2012 to the farmers at Jeevari village for lac cultivation with inter cropping under 'Direct to Consumer Project'.
- IFP, Ranchi organized a 5-day training programme on "Scientific lac cultivation for sustainable livelihood" from 18th to 22nd September 2012 wherein 23 progressive farmers attended the training and on "Bamboo propagation, cultivation and management for sustainable livelihood" from 24th to 28th September 2012 wherein 31 progressive farmers attended the training. The training programme was sponsored by State Institute of Rural Development (SIRD), Ranchi, Jharkhand.
- IFP, Ranchi organized a 5 days training program "Livelihood Generation through Non Timber Forest Product and Medicinal Plants" from 12th to 18th October 2012 wherein 27 progressive farmers attended the training. The training programme was sponsored by State Institute of Rural Development (SIRD), Ranchi, Jharkhand.
- Forest Research Institute (FRI), Dehradun organized a National Seminar on "Livelihood Opportunities in Fringe Forests: Research and Management Prospective" on 10th August 2012. The seminar was inaugurated by his Excellency Shri Shekhar Dutt, Hon'ble Governor of Chhattisgarh.
- Rain Forest Research Institute (RFRI), Jorhat conducted awareness generation programme on "Livelihood development and creation of carbon pool through bamboo plantation in degraded jhum land" in Jilangso village (Kohora) Karbi Anglong on 18th October, 2012. Fifty two farmers from Jilangso village, Rongtara village and Phumen Ingti Village actively participated in the programme.
- Socio-economic and vegetation studies in forest fringe villages of Kota district showed the dominance of *P. juliflora*, *S. urens*, *Z. numularis*, *A. leucophloa*, *Aistida*, *C. deciduas*, *S. oleiodes*, *T. purpuria* etc. among vegetation whereas, among different tribes these villages are dominated by Meena, Gujjar and Bheels. Their main source of

livelihood is agriculture and they grow soybean, wheat, bajra as their cash crop. Almost every village has primary school, electricity and drinking water facility, agriculture land is fertile and rich in humus at most of the places.

- Eight medicinal plants species were planted at Demo village nursery, Salawas for knowledge and use of local people. The five medicinal plants are *Nyctanthus arbortrestus* (Harsingar), *Cytopogon citrates* (Lemongrass), *Asparagus racemosus* (Satawari), *Crinum asiaticum* (Sudarsan), *Adhatoda beddomei* (Adusa) and three creepers are *Tinospora cordiflora* (Neem giloi), *Argyreia nervosa* (Tambeshwar Ghav Bel) and *Tylophora asthmatica* (Dama Bel).

Agreements with countries/ international organisations

ICFRE has initiated International Cooperation with a number of organizations including International Centre for Integrated Mountain Development (ICIMOD), Nepal; Japan International Cooperation Agency (JICA), Japan; UK Forestry Commission, Britain; Chinese Academy of Forestry, China; Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia; LM Fletcher Research Institute etc.

- The Memorandum of Understanding has now been signed between the Indian Council of Forestry Research and Education and the Chinese Academy of Forestry to foster cooperation between the two nations in identified fields of research. The MoU was signed by Dr. VK Bahuguna Director General, ICFRE and



Fig-46. Mountains Leh-landscape

Mr. Zhang Shougong, CAF president, on 31st August, 2011 in Beijing. The MoU signed between the two institutions will facilitate cooperation between two countries on identified areas of research. Dr. VK Bahuguna and Mr. Shougong discussed emerging areas of mutual interest like climate change, forest ecosystems, forest hydrology germ-plasm conservation, sustainable forest management and tree improvement.

- Proposals for Cooperation with ICIMOD and FRIM, Malaysia are under process.

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.

The specific objectives of the Institute are:

Education and Training

- To meet the demand for the trained human resource with managerial and analytical skills in the areas of forestry, environment and development management through regular educational courses.
- To update the knowledge and managerial skills of the serving professionals in the above areas through short-term training Programs.

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.

Dissemination

- To disseminate the research-based information/knowledge and meet the information needs of the forestry, environment and allied sectors through training, seminars and publications.

Databases and Information Systems

- To generate and maintain relevant databases that are essential for policy formulation, project planning and strategy development in forestry, environment and allied sectors
- To develop an Information Management System, which is compatible with and easily accessible for all users, i.e. from local (community) to global level.

Policy Formulation, Analysis and Advocacy

- To function as a national 'think tank' on forestry and environment aimed at developing appropriate policies and strategies.
- To play an advocacy role in the sectors of concern to promote adoption of appropriate policies and implementation strategies and safeguard the genuine interests of the disadvantaged stakeholders whenever necessary without compromising national interests.

Research

- Research constitutes one of the core activities of the Institute and during the year IIFM completed 12 research projects, out of which one was sponsored by IIFM and 11 were externally sponsored projects. Currently, there are 20 ongoing research projects at the Institute, out of which 15 projects are externally sponsored.

Centres of Excellence

International Centre for Community Forestry (ICCF)

The International Centre for Community Forestry (ICCF), functioning as a "Centre of Excellence" was established at the Institute's Campus on January 14, 2000 to cater to the growing need and interest in Community Forestry initiatives. The centre emphasizes upon strengthening the country's community forestry policy, rural livelihoods support system and development of small scale enterprises to support millions of people who depend and care for forests and its management. Following activities were undertaken by the Centre during the current year.

- A batch of 25 trainees of Regional Centre of Organic Farming, Jabalpur (National Centre of Organic Farming, Ghaziabad,

Department of Agriculture, Cooperation, Ministry of Agriculture, Govt. of India) visited ICCF on 6.7.12. Dr. A.S. Rajput, Scientific Officer led the group while from ICCF Prof. A.K. Dharni and Dr. Manoj Kr. Singh briefed the trainee participants about IIFM and IICF.

- ICCF is presently negotiating an agreement with Indo-European Chamber of Commerce & Industry (IECCI), Bhopal for the purpose of collaboration in various fields of Research & Development at regional, national and international level on case-to-case basis.

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 Natural Resource Management (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 Government of India.

The center is expected to generate the pool of knowledge and understanding on the emerging field of Sustainable Forest Management & Forest Certification for the benefit of forestry sector in the country.

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 Non-Governmental Organization (NGO) and Civil Society organisations, representatives of Panchyati Raj Institutions and Communities. A proposal of Action Plan for M.P. State Rural Livelihood Forum worth ₹ 3.48 crore has been submitted in December 2012.

Regional Center for National Afforestation and Eco-development Board (RCNAEB)

The Regional Centre for National

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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) and IIFM.

The main focus area of this Regional Centre is National Afforestation Programme (NAP) 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 current year, the Centre conducted five workshops, completed five research projects and commenced 10 new projects.

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 10 Management Development Programmes and organised three workshops.

Consultancy

Faculty members of the Institute undertake consulting assignments to provide solutions to the sector-specific problems and as inputs for policy making. An analysis of consulting assignments undertaken by IIFM faculty during the year 2012-13 include projects in areas such as Ecological studies, Environmental-Economic studies, Socio-economic studies (Developmental plans, programmers and projects), Evaluation of schemes and programmers and cross-functional areas of Forest Certification and sustainable forest resource management including Non-timber forest products. Among the sponsors of consulting assignments to IIFM include United Nations Environment Programme (UNEP), United Nations International Children's Fund (UNICEF), Gesellschaft für Internationale Zusammenarbeit (GIZ), Government of India (MoEF), State Forest Departments and Corporations. During the current year, two consultancy assignments were completed and six new assignments were received. In all, 14 consultancy assignments are going on. List of new assignments and completed assignments is given in Table-60.

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

Table-60. List of new & completed Consultancy Assignments (1.4.2012 to 31.12.2012)

Title of the Consulting assignment	Name of Team Leader & Team members	Name of the sponsoring organisation
New Assignments started during 2012-13		
Facilitation for Rubber Wood Certification	Dr. Manmohan Yadav Dr. R.B. Lal Prof. A.K. Patil	Tripura Forest Development and Plantations Corporation LTD
Assessment of Environmental services, vulnerability reduction and Institutional Arrangement of MGNREGA in MP	Dr. Bhaskar Sinha	GIZ New Delhi
Capacity building in National Planning for food security	Dr. Madhu Verma Dr. R.B. Lal	Division of Environment Policy Implementation, Ecosystem Services & Economics; United Nations Environment Program, Nairobi, KENYA
Strengthening capacity of District Level Officials on Social Protection Schemes and Conducting Social Audits in Guna and Shivpuri	Dr. Rekha Singhal Dr. Amitabh Pandey	UNICEF, State of Madhya Pradesh Bhopal
Landscape survey and developing micro plan for enhancement of forest quality and improvement of ecosystem services in the identified districts of Odisha	Dr. D. Debnath Dr. M.D. Omprakash & External consultant (Jadhavpur University)	Odisha Forest Department, Bhubaneswar
Revision of rates of NPV applicable for different classes/category of Forests	Dr. Madhu Verma and External Expert	IGF & CE- Adhoc-CAMPA, MOEF, New Delhi
Completed Assignments		
An evaluation of implementation of the scheduled tribes and other traditional forest dwellers forest rights Act 2006 (FRA)	Dr. D. Debnath Dr. Vijay Kumar Dr. K.N. Krishna Kumar Prof. P Jadhav	Department of ST & SC, Govt. of MP
Technical Agency for Development of Clusters-Lac cluster Hoshangabad and Bamboo cluster Balaghat in Madhya Pradesh	Dr. Manmohan Yadav Dr. Amitabh Pandey	Government of India, MSME, KVIC (Directorate of SFURTI), Mumbai

participated and presented research papers in national and international conferences.

Other Activities

The year 2012-13 was marked by significant progress in different areas of academic activities necessary for the holistic development of the students. The Students Council of IIFM has been very active during this year and organized number of extra and co-curricular activities based on themes like entrepreneurship, Forest, Environmental & Social issues and Sports events.

Budget Allocation & Progress of Expenditure

₹ 75 crores has been approved for the Institute for the XXII Five Year Plan period.

During the F.Y. 2012-13, the total grant sanctioned to the Institute was ₹13.15 crores, out of which ₹10.50 crores was towards Plan Expenditure and ₹2.65 crores towards non-plan expenditure. The Corpus fund of the Institute as on 31.3.2012 was ₹ 46.61 crores. Till 31.12.2012, an expenditure of ₹ 9.98 crores was incurred by the Institute for the F.Y. 2012-13.

Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru

Introduction

IPIRTI's vision is to become an apex institution of international repute by equipping itself with concurrent state-of-the-art technology and develop in-house frontline expertise to be able to carry-out necessary R&D towards advising and/or providing competitive consultancy to the academia as well as wood & other lignocellulosic based panel industry sector regarding the conservation of natural forests through development and adoption of efficient technologies in the field of wood and panel products from renewable fibres including

plantation timbers and bamboo while meeting the vital needs of the developing society.

To achieve this vision, IPIRTI is engaged in Research & Development, Training & Education, Testing & Standardization and Extension on all aspects related to plywood and panel products from wood and other lignocellulosic materials from renewable natural fibers.

The research activities are periodically reviewed and rationalized to keep pace with changing needs of the industry, national policies, raw material scenario and needs of the people for panel products.

Global concern for protection of environment and conservation of bio-diversity are reflected in the research programmes. The important views kept in mind while deciding the project activities are conservation of natural forests and meeting the needs of the people for panel products from wood and other lignocellulosic materials.

Research work done in the Year 2012-2013

- Development of Technology for manufacture of particle board from bamboo and bagasse

Due to the increasing shortage of industrial wood and also associated policy changes in recent years, agro residues like Bagasse has become an important raw material alternative to wood for panel products. In this study, investigations were carried out to manufacture particle boards from depth bagasse, pith bagasse and replacing 30-40% of bagasse by wood. From the test results of particle boards made, it is found that the bagasse with pith and without pith 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.

– **Efficacy of Copper–Ethanolamine-Boron based wood preservative against wood destroying organisms**

The main aim of this project was to find out the alternative fixing agent to chromium. Chromium is being used to fix copper and boron in the wood. Chromium is carcinogenic in nature. Moreover it has been banned in many European countries and hence attempt was made to use ethanolamine in place of chromium to fix the copper and boron in the wood. A new environ friendly formulation by using copper-ethanolamine-boron (CEB) has been developed. The percentage of chemical incorporation in glue line has been optimized. From the toxicological studies it was found that CEB 2.5 percent performed excellent against the various wood destroying organisms. Factory trial was done at M/s. Green ply India Limited, Kolkata.

– **Study on the suitability of the manufacture of Medium Density Fibre board from rice straw**

The main aim of this study was to assess the suitability of rice straw for the manufacture of medium density fiber board with conventional resins. This study will help in efficient utilization of rice straw as an alternate resource for the industrial manufacture of particleboards and fiberboards. From the results of the study it was found that either 100% rice straw fibers bonded with MDI or 50% replacement of rice straw fibers with wood fibers blended with synthetic formaldehyde based resin systems can be adopted by the industries

for commercial production. Adopting synthetic formaldehyde resin systems for making rice straw MDF would result in the cost reduction of adhesive by 40% -60% when compared with MDI resin

– **Life Cycle Assessment of Plywood and Bamboo Composite Products – Sponsored by Clean Technology (CT) division of MoEF, Govt. of India.**

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 collected during the production have indicated negligible level of solids and the toxic chemicals.

Completed Research Projects

- Development of technique for production of face veneer from reconstituted plantation timber.
- Study on fire performance of door and shutter assemblies and formulation of standards in line with international standards.
- Evaluation of earthquake resistant feature of bamboo housing system using shock table.

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- Development of bio-adhesive with less emission of formaldehyde for wood and panel products.
- Up-scaling of Technology for manufacture of single/3 layered particle Board from Rice Husk
- Efficacy of Copper-Ethanolamine-Boron based wood preservative against wood destroying organisms
- Establishment of Pilot Scale Facilities for R & D and Training in MDF

Completed Sponsored Project

- Evaluation of wood preservative- Protecto against Moulds, Termites and Borers for solid wood and plywood by glue line poisoning.
- Study on the Hygroscopic Nature of Medium Density Fibre Board – sponsored by M/S. Greenply Industries Ltd. , Kolkata.
- Energy Auditing and Carbon Footing in Manufacture of Bamboo Mat Corrugated Sheet (BMCS) and Bamboo Mat Ridge Cap (BMRC).
- Study on the Feasibility of the manufacture of Medium Density Fibre board from rice straw.
- Evaluation of wood preservative -PILOT chemical against wood destroying Fungus, Termites and Borer for plywood by glue line poisoning.

Wildlife Research

Wildlife Institute of India (WII), Dehradun

Introduction

Wildlife Institute of India (WII) was established in 1986 as an autonomous institute of the Ministry of Environment & Forests, Government of India. 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 products in wildlife science and mainstream it in capacity building programmes for various target groups and provide advisory support to Central and State Government.

Research Projects

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 2012-13, 7 research projects were completed and 41 research projects were ongoing in the Institute. The Institute worked on the following important research activities during the reporting period:

Tiger reintroduction project in Sariska

On 7th August, 2012, the first reintroduced tigress (ST2) was photographed with two cubs signifying the success of the tiger reintroduction

project in Sariska, carried out by the Institute. During January 2013, Wildlife Institute of India re-introduced 2 sub-adult tigresses to Sariska from Ranthambhore Tiger Reserve as part of supplementation to the existing population of 7 tigers in Sariska.

Initiatives on Trans-boundary Landscape Management

The Hindu Kush-Himalayan (HKH) region forms one of the most fragile mountain chains of the world. The region is endowed with diverse ecosystems that provide numerous goods and services to the millions of people within and outside its geographical boundaries. However, population growth and increasing anthropogenic pressures on these resources are increasingly besieging the irreplaceable biodiversity of the region. The International Centre for Integrated Mountain Development (ICIMOD), an intergovernmental, regional knowledge centre based at Kathmandu, Nepal has initiated efforts in developing transboundary landscape management approach to conservation by involving concerned country's.

Seven transboundary landscapes have been identified in the HKH region and four of them – (i) Kailash Sacred Landscape, (ii) Kangchenjunga Landscape, (iii) Brahmaputra-Salween Landscape, and (iv) Cheerapunjee- Chittagong Hill Tract Landscape are relevant to India. The Wildlife Institute of India is one of the partner institutions

in such priority conservation efforts on transboundary landscape management and conservation. During the reporting period, several Workshops/ Consultative Meetings/ Training were conducted by ICIMOD at Nepal and India and participating scientists from the Institute participated in such activities viz. Kailash Sacred Landscape Conservation Initiative Implementation Phase – Regional Inception Workshop during 01-05 May, 2012 in Kathmandu, Nepal; Expert Consultation on Transboundary Biodiversity Management in Kangchendjunga Landscape at Gangtok, Sikkim during August 16-18, 2012; and Field Training Course on GLORIA Experiment under Kailash Sacred Landscape Conservation Initiative organized during August 22-September 6, 2012 in Upper Humla, Nepal.

Convention on Migratory Species

Wildlife Institute of India provided required technical inputs in the 17th meeting of the Scientific Council of Convention on Migratory Species, which took place prior to



Fig-47. Greyleg Goose (*Anser anser*) – beautiful migratory bird

Conference of the Parties (CoP), in November 17-18, 2011, in Bergen, Norway. Wildlife Institute of India has been assisting the Ministry of Environment and Forests, Government of India in implementing the United Nation Environment Programme (UNEP)/CMS Dugong Memorandum of Understanding (MoU) in India. As part of Dugong MoU, Wildlife Institute of India organised the First South Asia Sub-Regional Workshop and now conducting 'All India Dugong Survey' to finalize the 'National Action Plan of Dugong Conservation in India'.

Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA)

IOSEA Sub-regional Focal Points were appointed at the Sixth Meeting of Signatory States (Bangkok, January 2012). India is the sub-regional Focal Point for Northern Indian Ocean, which includes Bangladesh, India, Maldives, Pakistan and Sri Lanka. Coincidentally, these countries are also part of the South-Asia Sub-region of CMS Dugong-MoU, in which India is again the focal point. WII assisted MoEF in implementing various actions recommended by IOSEA which include the identification of priority sites for sea turtles conservation in India.

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

CITES Cell of the Wildlife Institute of India has been assisting the Ministry of Environment and Forests, Government of India on various issues related to CITES. In this reporting period, WII assisted the Institute of Forests Genetics and Tree Breeding to organise CITES Awareness Training Workshop for various enforcement agencies in the country. Further, WII also reviewed the existing lists of various Schedules

of the Wildlife (Protection) Act, 1972 in line with CITES Appendices in collaboration with the Zoological Survey of India.

Landscape Approach to Conservation

The World Bank and Global Environment Facility (GEF) supported 'Biodiversity Conservation and Rural Livelihood Improvement Project (BCRLIP)' is being implemented in two conservation priority landscapes. The Wildlife Institute of India has been assigned a major task on National Capacity Building on Landscape Approach to Conservation. During the reporting period, as a knowledge management centre on development and practice of landscape approach to conservation, WII began supporting the Askot and LRK landscapes in preparing micro-plans for the local communities, incorporating conservation and livelihood improvement programmes. Spearhead teams in both the sites were trained. For scientific backstopping at Askot, work on ecological mapping and identification of biological indicators was started. The Field Learning Centres at Gir, Periyar and Kalakkad were visited and documentation of good practices began. An approach paper was prepared and presented in CoP 11, highlighting principles and approach to landscape management in India.

Support provided by for inscription of Western Ghats as a Serial Natural World Heritage Site

The Wildlife Institute of India provided technical support in the nomination and final inscription of Western Ghats a Serial Natural World Heritage Site. In the 36th Session of the World Heritage Committee held in Saint Petersburg, Russian Federation during June 24-July 6, 2012, the Western Ghats was inscribed as the sixth Natural World Heritage property

in India. It was inscribed for Criteria IX - for being an outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; and Criteria X - for containing the most important and significant natural habitats for *in-situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation. The highlight of this Natural World Heritage Site is that it is the first Serial Nomination made from India and it has seven sub-clusters representing the bioclimatic, bio-geographic and biological diversity in the Western Ghats. There are 39 elements that were identified within the seven sub-clusters covering a total area of 7953.15 sq. km. that is being managed by the State Forest Departments of Tamil Nadu, Kerala, Karnataka and Maharashtra.

Macro level EIA study of Bellary district in Karnataka

In response to the directives of the Hon'ble Supreme Court of India to carry out a macro level EIA study of Bellary district in Karnataka, WII partnered with Forest Survey of India (FSI), Indian Council of Forestry Research Education (ICFRE), The National Environmental Engineering Research Institute (NEERI) and National Remote Sensing Centre (NRSC) for the study 'Macro Level Environmental Impact Assessment Study Report of Chitradurga and Tumkur Districts, Karnataka'.

Assessment of Cumulative Impacts of Hydroelectric Projects on Aquatic and Terrestrial Biodiversity in Alaknanda and Bhagirathi Basins, Uttarakhand

The MoEF requested the Wildlife Institute of India (WII) to conduct the study on the

cumulative environmental/ecological impacts of hydro electric projects in the Bhagirathi and Alaknanda river basins on the riverine ecosystem including terrestrial and aquatic biodiversity in collaboration with specialized institutions. In response to this, WII conducted the above study that had the following objectives: (i) to assess the baseline status of rare, endangered and threatened (RET) species of flora and fauna dependent on riverine habitats and floodplains of Alaknanda and Bhagirathi river basins; (ii) to identify the critical wildlife habitats along the existing and planned hydroelectric projects located on rivers Alaknanda and Bhagirathi up to Devaprayag; (iii) delineate river stretches critical for conservation of rare, endangered and threatened (RET) aquatic species; and (iv) to assess the key habitat variables for RET species, including minimum flows and volume of water for ecological sustainability of the two rivers.

The final report entitled 'Assessment of Cumulative Impacts of Hydroelectric Projects on Aquatic and Terrestrial Biodiversity in Alaknanda and Bhagirathi Basins, Uttarakhand. Wildlife Institute of India', was submitted to the Ministry of Environment and Forests, Govt. of India.

Wildlife Forensic Cell

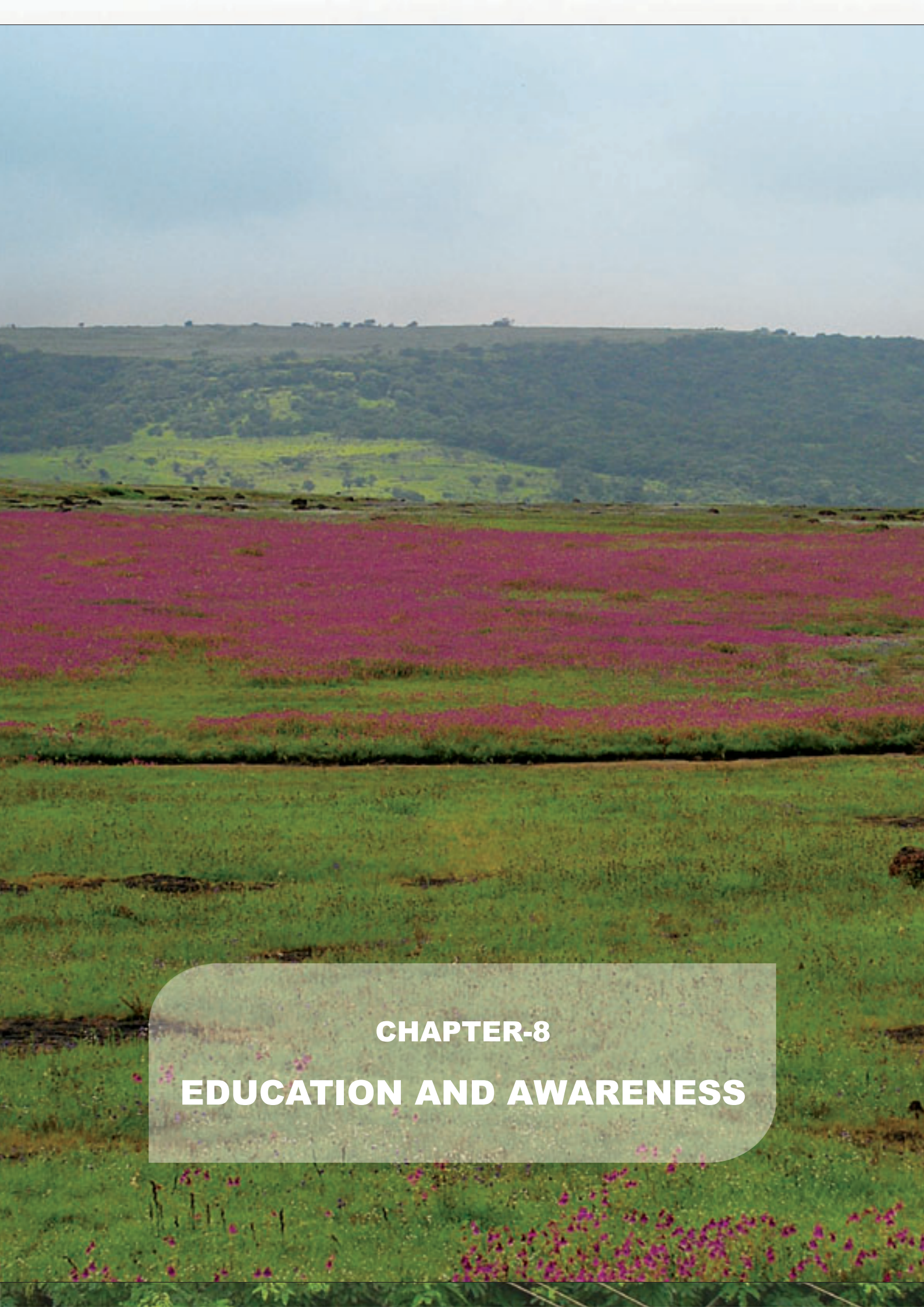
Since its inception, the Wildlife Forensic Cell (WFC) at the Institute aims to develop and disseminate the techniques relevant to wildlife forensics so as to cater the needs of various law enforcement agencies. Activities of the WFC during the year mainly pertain to: (i) Case analysis of wildlife offences, (ii) development of protocols, and (iii) sensitization of enforcement agencies through appropriate hands on training.

Altogether, 254 wildlife offence cases were referred during the reporting period to

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WFC by the State forest departments, Police & Central Bureau of Investigation (CBI), Court(s), Department of Customs and Central Excise, etc. One hundred and four (104) wildlife offence cases were analyzed using morphometric and DNA based techniques and subsequently reports were submitted to the concerned law enforcement agencies. The WFC received around 60 court summons for appearance as expert scientific witness under wildlife offence cases in various courts within the country. Based on the previous wildlife offence investigation reports submitted, convictions have been reported from Khatima, Uttarakhand and Allahabad, Uttar Pradesh. During the reporting period, the WFC successfully developed a protocol for forensic differentiation of the biological samples of Indian wild pig (*Sus scrofa cristatus*) and domestic pig (*Sus scrofa domestica*). The Indian wild pig (*S. s. cristatus*)

is a protected species and listed in the Indian Wildlife (Protection) Act, 1972. The wild pig is often hunted illegally and sold in market as meat warranting punishment under law. Nine forensically informative nucleotide sequence (FINS) variations were observed between Indian wild and domestic pigs. The overall genetic variation exhibited by this study will be helpful in forensic identification of the biological samples of wild and domestic pigs. Study also helped in differentiating the Indian wild pig from other wild pig races. Furthermore, hands on training relevant to wildlife forensics was provided to various visiting classes of the Indian Forest Service/ State Forest Service officers, and also of the officials from the Indian Revenue Service so as to identify various parts, products and derivatives those are usually encountered in various wildlife offence cases.



CHAPTER-8
EDUCATION AND AWARENESS

Environmental Education, Awareness and Training

Introduction

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. The phenomenal response that NGC has received has made the network of more than 1,00,000 Eco clubs across the country in 12 years, making it one of the largest conservation networks. The unique partnership between the MoEF, the states Government agencies alongwith the dedicated Non Governmental Organisations (NGOs), working in the field of Environmental Education has contributed to the success of the programme. During financial year 2012-13 (as on 21.01.2013), 75,797 Eco-clubs were supported by the Ministry across the country.

Also in order to strengthen monitoring mechanism of NGC programme, MoEF is in process to establish Management Information system (MIS) which will open up vistas in sharing and accessing the information on NGC among all stakeholders. The MIS reporting and monitoring would be interactive and creative in ensuring NGC mobility and services.

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 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 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 'Biodiversity & Conservation'. The following sub-themes were considered for financial assistance:

- Critical, endangered and endemic species conservation
- Conservation of critical and fragile habitats & corridors
- Forest conservation
- Wetlands conservation
- Conservation of Mangroves & Coral Reefs

- Land degradation & biodiversity
- Conservation and promotion of Medicinal plants
- Renewable energy - solar, wind, biogas, etc
- Vermi-composting & organic farming
- Agro forestry
- Cultivation of Fruit trees
- Germplasm conservation
- Restoration of Grasslands
- Livestock- indigenous breed conservation
- Biodiversity conservation in Urban & peri-Urban areas
- Maintaining people's biodiversity registers
- Biodiversity & traditional knowledge and equitable benefit sharing
- Biodiversity based traditional crafts
- Biodiversity and sustainable practices (rainwater harvesting, use of eco-friendly bags, etc)
- Sustainable Tourism
- Gender in Biodiversity conservation

Thirty three Regional Resource Agencies (RRAs) appointed by the Ministry are involved in conducting, supervising and monitoring the NEAC activities during the year. A total of 13,676 organisations have been involved in the campaign across the country during the year 2012-13 and the Ministry has sanctioned an amount of ₹12.09 Cr to the RRAs for further disbursement among the approved participating organisations.

Mass Media

The Media Cell of the Ministry is mandated to take 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).

Science Express: Biodiversity Special (SEBS)

The Ministry of Environment & Forests (MoEF), in a unique partnership with Department of Science & Technology (DST), launched an innovative exhibition mounted on a 16 coach air conditioned train rake. It envisaged running this innovative train mounted exhibition in two phases to cover at least 100 locations on Broad Gauge network of Indian Railway across the entire length and breadth of the country.

Eight coaches of *Science Express-Biodiversity Special* are solely dedicated to showcasing the myriad biodiversity spread across the bio-geographical zones, viz. Trans-Himalaya & the Himalayas, Gangetic Plains, North East India, the Desert & Semi-Arid Zone, Western Ghats, Deccan Peninsula and Coasts & Islands with a focus on range of Biological diversity, critically endangered species, biodiversity hotspots, domesticated biodiversity, biodiversity & livelihoods, bio-culture; threats/challenges, conservation measures, success stories & unique experiences. Four other coaches have interesting & informative exhibits on Climate Change, Energy and Water conservation while another coach has the *Joy of Science* Lab in which students are guided to perform various experiments and activities to understand concepts in science besides a demonstration-cum-training facility for capacity building of teachers. About 40 young Science/Biodiversity Communicators remained on-board in another coach throughout the journey and explained



Fig-48. Flagging -off SEBS by Hon'ble Minister of Environment & Forest (I/C) Smt. Jayanti Natarajan & Smt. Sheila Dixit, Hon'ble Chief Minister of Delhi on World Environment Day, 2012

the content and purpose of the exhibition to curious visitors.

SEBS was launched on World Environment Day (5 June 2012) from Delhi Safdarjung by Smt. Sheila Dixit, Hon'ble Chief Minister of Delhi and Smt. Jayanti Natarajan, Hon'ble Minister of State (I/C), (MoEF). During its first phase which ended on 22 December 2012 at Ahmedabad, it made halts of 3-4 days duration each at 51 locations and over 23 lakh people visited SEBS, this was way above the envisaged target of 15 lakhs visitors. It includes 6 lakh students and 32000 teachers from 7000 schools. The train was also stationed at Secunderabad during 9-19 October 2012 to showcase it to delegates to CoP-11.

Wherever the train traveled, activities were planned beforehand to engage visitors across different age groups to reinforce the message of SEBS and specific Outreach Programme were

conducted at local schools and institutions associated with the National Environment Awareness Programme (NEAC) and National Green Corps (NGC) of MoEF and associates & partners of DST. In addition, a variety of interesting and informative take-away material was made available for wider distribution among visitors.

The train also reflected the dedication, diligence and dynamism of the knowledge partners who contributed immensely to bring forth the essence of 'biodiversity' and conservation practices as well as issues of 'climate change' in our country. Vikram A Sarabhai Community Science Centre (VASCSC) and Centre for Environment Education (CEE), Ahmedabad along with the lead knowledge partner including Bombay Natural History Society, Centre for Ecological Sciences, Indian Institute of Science, G. B. Pant Institute of Himalayan



Fig-49. School Students visiting the SEBS

Environment and Development, Indian Council of Forestry Research and Education, National Centre for Sustainable Coastal Management, National Museum of Natural History, Wildlife Institute of India and Wildlife Trust of India, and several others contributed to give extremely useful information in this unique exhibition on wheel.

Print, electronic and digital media gave special attention to this programme with over 500 stories/ news items in all leading national & regional newspapers including vernacular besides most TV Channels and major related websites. Thus through this innovative venture, MoEF was able to reach out to even those who could not physically visit the train but were made aware of its content by the extensive coverage in media.

Green Haat-2012

Green Haat 2012 is an initiative of Ministry of Environment and Forests (MoEF) Government of India to showcase different products made by various NGO's, Artisans and various State Forest Development Corporation/ Federations Forest based products constitute a significant segment of the decentralized/ unorganized Sector of our economy.

Its objective is to raise awareness on the rich forest and bio diverse heritage of the country among the growing urban population often living far off from the forests. The initiative is to showcase various value added forest based products developed by Rural Artisans, Community Self Help Groups, NGOs, and State Federations and thus provide support to biodiversity conservation and sustainable livelihoods

- The first Green Haat was organised on the eve of World Environment Day 2011 where India played as a Global Host. Encouraged

by the response received, a decision was taken to make it an annual event.

- This year, the event is providing platform for exhibition of forests based handicraft, and Bio diverse and Organic Food & Herbal remedies under different categories of value added forest products.
- Through Green Haat the MoEF intends to build and capitalize upon the rich traditional knowledge to the local communities to augment their forest based livelihood and generate awareness about the economic significance of forests among all sections of the society.

Green Haat 2012 was organised at Dilli Haat opposite INA Market, New Delhi for fifteen days with effect from 1st March 2012 to 15th March 2012. About 1.25 lakh people visited Green Haat 2012. The Forest based products put up in the fifty stalls in Green Haat 2012 can broadly be classified in following mentioned three categories:

- Forests based handicrafts (bamboo, cane, grass and others)
- Herbal Medicine/Health/Cosmetics etc.
- Food item (forest/agro biodiverse food.

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 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 2012-13, thirty six organisations were approved for financial assistance for conducting Seminars/ Symposia /Workshop/Conferences etc.

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. During the financial year 2012-13, twenty one organisations were approved for financial assistance for conducting other awareness programme.

Performance/ Achievements/ Progress made in year 2012-13

- 75,797 Eco-clubs under NGC programme were supported with the financial assistance of ₹ 20.4 Crore during 2012-13 (as on 21st January, 2013).
- The financial assistance of ₹ 12.09 crore was sanctioned under NEAC & number of participating organisations in NEAC reached upto 13,676.
- *Science Express: Biodiversity Special* - a collaborative initiative of MoEF and Department of Science & Technology was launched to generate environmental awareness among 2.5 lakh people. We crossed the target and achieved the number of 2.5 million visitors.

State-wise status

- Number of eco-clubs established in States / UTs is given in Table-61.
- A detail of financial assistance released under the NGC programme is given in Table-62.
- Amount sanctioned under NEAC programme and participating organisations is given in Table-63 & 64.

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Table-61. Number of eco-clubs established in States/ UTs (*as on 21st Jan 2013)

S. No.	State/UT	No. of Eco-clubs		
		2012-13*	2011-12	2010-11
1.	Andhra Pradesh	5750	5750	5750
2.	Arunachal Pradesh (NE)			
3.	Assam (NE)	5407	5207	5207
4.	Bihar		8871	8971
5.	Chandigarh (UT)			
6.	Chhattisgarh		4000	3932
7.	Dadra & Nagar Haveli (UT)			
8.	Daman & Diu (UT)			
9.	Delhi (NCT)	1796	1796	1796
10.	Goa			
11.	Gujarat	6500		6750
12.	Haryana		5250	
13.	Himachal Pradesh		3000	
14.	Jammu & Kashmir			
15.	Jharkhand		2842	2842
16.	Karnataka			8500
17.	Kerala	3500	3500	3500
18.	Lakshadweep (UT)			
19.	Maharashtra	8819	8905	8905
20.	Manipur (NE)		1750	
21.	Meghalaya (NE)			
22.	Mizoram (NE)		1235	1235
23.	Madhya Pradesh	12500	12500	12500
24.	Nagaland (NE)	2275	2280	2275
25.	Odisha	7500	7500	7500
26.	Puducherry (UT)			
27.	Punjab	5500	5000	5000
28.	Rajasthan	8250	8250	8000
29.	Sikkim (NE)			
30.	Tamil Nadu	8000	8000	7500
31.	Tripura (NE)		750	600
32.	Uttar Pradesh			
33.	Uttaranchal			
34.	West Bengal		3912	
	Total	75797	100298	100763

Table-62. Financial assistance released under the NGC programme (as on 21st Jan 2013)

(in ₹)

S. No.	STATE/UT	2012-13	2011-12	2010-11
1	Andhra Pradesh	15697500	15697500	15697500
2	Andaman & Nicobar Islands (UT)			
3	Arunachal Pradesh (NE)			
4	Assam (NE)	14877125	14102125	14377125
5	Bihar		24283875	24546375
6	Chhattisgarh		10911500	10741500
7	Chandigarh (UT)			
8	Dadra & Nagar (UT)			
9	Daman & Diu (UT)			
10	Delhi (NCT)	5025750	4950750	4791182
11	Goa			
12	Gujarat	15651250		18372375
13	Haryana		14300000	
14	Himachal Pradesh		8107976	
15	Jammu & Kashmir			
16	Jharkhand		3507481	4100985
17	Karnataka			12562262
18	Kerala	9555000	9555000	9450000
19	Lakshadweep (UT)			
20	Madhya Pradesh	34125000	34125000	34125000
21	Maharashtra	23460122	23714781	23718362
22	Manipur (NE)		4780000	
23	Meghalaya (NE)			
24	Mizoram (NE)		3451875	3451875
25	Nagaland (NE)	7036250	6273125	12097125
26	Odisha	20372260	20193734	20474511
27	Puducherry (UT)			
28	Punjab	14950000	13650000	13650000
29	Rajasthan	22306369	22522154	21840000
30	Tamil Nadu	21651248	21744654	20475000
31	Tripura (NE)		2055000	1680000
32	Sikkim (NE)			
33	Uttarakhand			
34	Uttar Pradesh			
35	West Bengal		10767750	
	Total	204707874	268694280	266534495

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Table-63. Amount sanctioned under NEAC programme since 2010-11

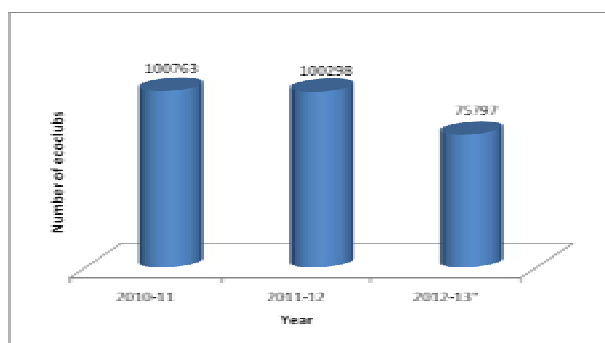
(in ₹)

S. No.	State/UT	Amount sanctioned (2012-13)	Amount sanctioned (2011-12)	Amount sanctioned (2010-11)
1	Andhra Pradesh	7553000	6917500	6687600
2	Andaman & Nicobar Island	2620000	232000	162000
3	Arunachal Pradesh	40000	57000	164000
4	Assam	3694000	3364400	3708000
5	Bihar	6592000	6500000	6000000
6	Chhattisgarh	1162000	1247000	844000
7	Dadar & Nagar Haveli		14000	-
8	Daman & Diu	81000	68000	85000
9	Delhi	1214000	1151000	1560000
10	Goa	110000	8000	7000
11	Gujarat	6488000	5222000	4485000
12	Haryana	4077000	12500000	10035500
13	Himachal Pradesh	3665000	3011000	1735500
14	Jammu & Kashmir	9757300	9170000	8376500
15	Jharkhand		4807000	4456000
16	Karnataka	2275000	3273000	2784600
17	Kerala	2811000	2606000	2230000
18	Lakshadweep			
19	Madhya Pradesh	8609000	6313000	6551000
20	Maharashtra	6305000	5743000	5307500
21	Manipur	2600000	2445000	2383000
22	Meghalaya	30000	97000	88000
23	Mizoram	2540000	2278000	2065000
24	Nagaland	1605000	1601000	1339000
25	Odisha	9076000	8416000	8112000
26	Puducherry	515000	543000	571000
27	Punjab & Chandigarh	5622500	3472300	3536000
28	Rajasthan	2512100	2168000	3044000
29	Sikkim	886000	852000	507000
30	Tamil Nadu	6243000	5760000	6230300
31	Tripura	2533000	2400000	2148000
32	Uttar Pradesh	11487000	11556000	10772000
33	Uttarakhand	1087500	664000	624000
34	West Bengal	7151000	6787000	5881000
	Total	120941400	121243200	112479500

Table-64. Number of participating organisation in 2010-11, 2011-12 and 2012-13

S. No.	State/UT	Participating Organisations (2012-2013)	Participating Organisations (2011-2012)	Participating Organisations (2010-2011)
1	Andhra Pradesh	845	837	844
2	Andaman & Nicobar Island	22	22	
3	Arunachal Pradesh	4	4	
4	Assam	725	465	582
5	Bihar	950	972	594
6	Chhattisgarh	116	169	110
7	Dadar & Nagar Haveli			
8	Daman & Diu	7	6	
9	Delhi	120	133	
10	Goa	11		
11	Gujarat	638	563	486
12	Haryana	393	1041	846
13	Himachal Pradesh	315	291	141
14	Jammu & Kashmir	894	1174	827
15	Jharkhand		513	445
16	Karnataka	216	464	425
17	Kerala **	255	255	300
18	Lakshadweep			
19	Madhya Pradesh	1059	707	805
20	Maharashtra *	862	861	599
21	Manipur	350	306	303
22	Meghalaya	3	10	
23	Mizoram	508	432	299
24	Nagaland	138	170	155
25	Odisha	974	1014	765
26	Puducherry	45	59	67
27	Punjab & Chandigarh	479	220	261
28	Rajasthan	231	229	305
29	Sikkim	118	111	45
30	Tamil Nadu	665	610	738
31	Tripura	316	269	243
32	Uttar Pradesh	1147	1397	1230
33	Uttarakhand	93	56	57
34	West Bengal	1177	937	583
	Total	13676	14297	12055

(* It includes Dadar Nagar Haveli ; **Kerala includes Lakshadweep)



*As on 21st Jan 2013

Fig-50. Number of ecoclubs supported under NGC programme

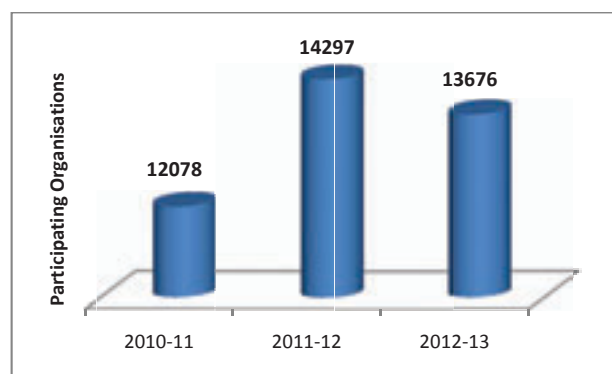


Fig-51. Year wise support and number of participating organisations under NEAC

Comparison of Achievements with previous years/progress made in 2012-13

Number of ecoclubs supported under NGC since 2010-11 to 2012-13 is shown in Fig-50.

The number of participating organisations in NEAC from 2010-11 to 2012-13 (Fig-51).

Budget Allocation and progress of expenditure during 2012-13; XII Plan Outlay

The budget allocation of the scheme and progress of expenditure from 2010-11 to 2012-13 (as on 21st January 2013) is given in Fig-52.

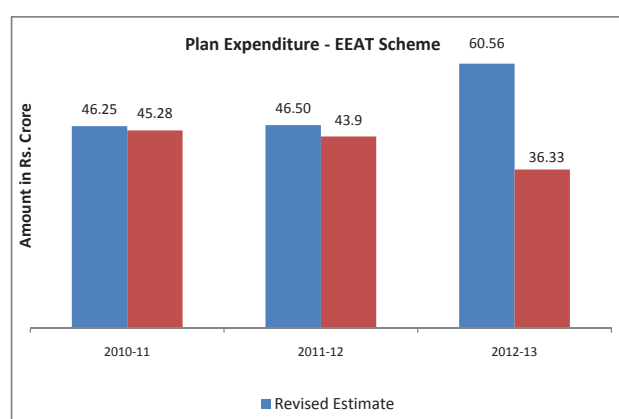


Fig-52. Budget allocation and progress of expenditure

The XII plan outlay for the EEAT scheme is Rs 428.20 cr. and for the CoE is Rs 110.00 cr.

National Museum of Natural History Introduction

The National Museum of Natural History (NMNH), New Delhi is an institution devoted to Environmental Education (EE) and 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 Disabilities. The Museum also undertakes many outreach programmes such as Temporary Exhibitions, Mobile Exhibitions and a large number of Nature Camps. It also arranges many local and National level competitions leading to Young Environmentalist of the Year Award (YEYA).

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).

Objectives

- To implement the policies of the Ministry under the scheme of environmental education, training and awareness.
- To develop scientific temper in the society on environment and natural history/ heritage of the country.
- To innovate in natural history museum curatorship consonant with the scope of the Museum.
- To create human resource in natural history museum curatorship.
- To develop the NMNH as an institution of international standard.

The NMNH has been undertaking various Environmental educational programmes through the educational activities. These also include various programmes and competitions on the following occasions.

- World Environment Day
- Summer Programme-Green Teens and Green Cubs
- Earth Day
- International day for Preservation of Ozone Layer
- Wildlife week
- Teacher orientation workshop
- Programme for disabled children
- World Wetland Day

In addition, the NMNH has excelled in Communication, Education and Public Awareness (CEPA) about Biodiversity. It has also developed thrust areas on Museum Accessibility (Social inclusion) and Traditional Knowledge about Biodiversity (Intangible Natural Heritage)

Performance/ achievements/ progress made in 2012-2013

- **Educational Activities:** NMNH along with its Regional Museums of Natural History (RMNH) organises a number of in-house and outreach programmes for the benefit of school children, college students, teachers, challenged 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 day, Wildlife Week, were observed and different programmes for school children and challenged children were also organised. The Museum organises 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 Regional Centres 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 has been printed on the prize winning entries of poster making competition on the "Biodiversity of Western Ghats" organised by NMNH and RMNH. The NMNH and its Regional Museums also published posters and booklets including the 'Tryst with Nature' A Green Magazine on Explore Nature & Environment on Museums Programme, 2012.

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Exhibitions

- **Mobile Exhibition:** Exhibition on Wheels on the theme “Forest Wealth” was on display on 28th and 29th April, 2012 at Capital High School, Unit-III, Bhubaneswar on the occasion of Diamond Jubilee celebration of the school, 7th & 8th June 2012 at Shri Aurobindo Navodayama Siksha Niketan, Markona, Balasore, Odisha, at Adivasi Exhibition ground, Bhubaneswar from 2nd to 6th November 2012 during 11th Anjali International Children’s Festival 2012 and at Government High School, Unit – I Bhubaneswar on 11th November 2012, to create an understanding and awareness among the students and general public about the forest resources, their role, and sustainable use of forest resources. Expenditure incurred for the programme was ₹15,000/-.
 - **Exhibition of Baleen Whale Skeleton:** During the 8th Anniversary of the RMNH Bhubaneswar on 10th August 2012 an Exhibition of 47.3ft. Baleen Whale skeleton and some Interesting Marine Creatures was inaugurated by Shri Naveen Patnaik Hon’ble Chief Minister of Odisha in the presence of Shri Bijayashree Routray, Hon’ble Minister, Forest & Environment, Labour & Employees State Insurance, Government of Odisha, Shri Debi Prasad Mishra, Hon’ble Minister, Agriculture, Fisheries and Animal Resource Development, Govt. of Odisha, Dr. (Mrs) P. Mohanty-Hejmadi, Former Vice Chancellor, Sambalpur University, Dr. G.V. Subrahmanyam, Advisor Ministry of Environment & Forests, Govt. of India and Dr. B Venugopal Director, National Museum of Natural History. As a part of this programme, painting competition and Quiz competition was also organized for children. Total expenditure for the programme was Rs 60,000/-.
 - **Temporary Exhibition on “Wildlife and Tourism:** RMNH, Bhopal conducted a Temporary Exhibition on “Wildlife and Tourism” on the occasion of Wildlife Week 2012. Expenditure for the programme was Rs 2.00 lakhs.
 - **Temporary Exhibition on “Namma Mysooru”:** A Temporary exhibition on “Namma Mysooru” was opened in RMNH, Mysore. The exhibition was inaugurated by Shri P.S. Vastrad, IAS., Deputy Commissioner & District Magistrate, Mysore District on 17.11.2012. Shri B.P. Ravi, IFS., Chief Conservator of Forests & Executive Director, Sri Chamarajendra Zoological Gardens, Mysore presided over the function. Expenditure for the programme was Rs 2.00 lakhs.
- Workshops:
- **NMNH New Delhi:** A national workshop on “Evaluation of Museum Visitors and Exhibitions” is organised by the NMNH on 30th and 31st July, 2012. It is a capacity building training programme for the staff from the NMNH and other Museums as well as students of Museology/Heritage etc. Expenditure for the programme was Rs 30,000/-.
- The NMNH organised an International Conference on “Natural History of Indian Biodiversity” during 4th-5th October 2012 in Hyderabad as a side event of UN CoP 11 (Biodiversity).
- Two days workshop was conducted during 22nd– 23rd August, 2012 at NMNH, New Delhi for getting expert guidance from National Council of Education Research and Training (NCERT), District Institute

of Education and Training and In-service teachers of Navyug Schools to develop and evaluate Learning Kits for teaching Environmental Studies at Primary level based on NCERT curriculum. Trainee teachers from DIET (Daryaganj, R. K. Puram) also participated in this workshop. Expenditure for programme was Rs 30,000/-.

In order to sensitize the school children regarding understanding the human-nature relationship, a workshop was organised by NMNH with children to make "Seed Balls" from 29th November to 6th December, 2012. The objective of the workshop was to explain the technique of making "Seed Balls" and its use. The focus was on the Indian history of plants especially food crops and influences and value in today's urban context, that seed have life and how it grows and become food on our plate. An interactive installation with thousands of seed packed mud balls is prepared by the children. The mud balls consist of food crops, herbs, vegetables and flowering seeds. The seed balls are installed in the form of exhibit in the first floor gallery of the museum from where the visitors can take away the seed balls and throw them on any cultivable soil in their locality or in the flower pots at their home and see the natural growth of the plant from a seed. The workshop was open for the children from classes IV – VI. Expenditure for the programme was Rs 30,000/-.

- **RMNH Bhubaneswar:** The Museum organized a two days Teacher Training Workshop during 4th–5th October, 2012 in collaboration with Regional Institute of Education (NCERT), Bhubaneswar to develop Learning Kits in Biology for classes

of V to VII Standard level based on NCERT curriculum. Main objective of the workshop is to identify the content, text, activities, information sheets and write up to be incorporated in the form of user's guide for the Learning Kits in Biology with the guidance, interaction and inputs from experts and the participating teachers based on their classroom experiences. Expenditure for the programme was Rs 30,000/-.

- **RMNH Mysore:** A teacher's workshop was organised during 14th–15th Sept., 2012 in order to train the biology teachers in Mysore for making Biology Kits. Expenditure for the programme was Rs 30,000/-.
- **RMNH Bhopal:** Workshop on Biological Preservation Technique and Taxidermy was organized during 28th–29th September, 2012 as a part of regular training programme for in-service Museum Professional/ Biology Teachers/ Laboratory Assistant of various Museum/Schools/Colleges. Expenditure incurred for the programme was ₹30,000/-.

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. Expenditure for the programme was Rs 30,000/-.

NMNH was one of the venues of the popular TV event "Save Our Tigers" campaign by NDTV– Aircell on Sunday, 15th July, 2012. It was aimed at spreading awareness about the state of tigers and the threat to their survival. The event was collaboration among NMNH, Sanctuary

India magazine and NDTV and was covered live during the telethon. The activities included Drawing competition, Collage making, Mask making and Clay modeling. Many Units of the Museum (Education, Art, Modelling etc) along with Scientists were involved. A large number of school children from Delhi and National Capital Region (NCR) and their teachers, parents/guardians participated in this event. The event started at 10:00 am and continued till 6:00 pm. Special films based on nature, environment and wildlife especially on Tigers were screened in the Museum auditorium. School children were involved in making a large collage of Tiger in the Museum. Shri Nitin Gadkari, the President BJP and Dr. R. K. Pachauri, the DG of TERI visited the Museum during the programme and their opinion about saving the tigers were telecast by NDTV. Expenditure for programme was borne by NDTV-Aircell and Sanctuary India Magazine

Outreach Programmes

- **NMNH New Delhi:** A special out-reach programme was conducted for the children from Sapera community (Snake charmers) of Delhi during 5th-7th July, 2012 to make them aware of their environment and help them use the Museum resources to enhance their knowledge about nature and wildlife through various activities and visits. The programme included exposure to the Museum resources, creative programmes in the Museum, interactive sessions in the Sapera colony, visit to Aravalli Biodiversity Park, Vasant Vihar etc. In addition to the Education, Art and Modelling units, a few outside experts and NGO "Khushi" were involved in organising the programme. There was an interesting session on

evolution of snakes, snakes of India, types of poisons, poisonous & non-poisonous snakes and their habits & habitats by the Snake expert. The snake charmers shared their knowledge about the herbs that they use for treating snake bite victims and also played tune on their Been. Expenditure for the programme was ₹30,000/-.

- **RMNH Bhubaneswar:** Environmental Awareness Programmes-2012 were held at Jawahar Navodaya Vidyalaya (JNV), Khordha on 18th July 2012, at JNV, Cuttack on 20th July 2012, at JNV Konark, Puri District on 18th August 2012, at JNV, Salbani, Mayurbhanj District on 19th August 2012, at JNV, Panikoili, Jajpur District on 14th September-2012, at JNV, Rahama, Jagatsinghpur District on 18th September-2012, JNV, Sarang, Dhenkanal District on 11th October 2012, at JNV, Bagudi, Balasore District on 13th October 2012, JNV, Baro, Kendrapara District on 8th Dec. 2012 and at JNV Belpada and Bolangir District on 16th December 2012. The programme included a written quiz on environment followed by film show on nature, environment & wildlife, presentation on poisonous and non-poisonous snakes and interaction with the participants. Expenditure for the programme was ₹ 2.00 lakhs.

Earth Day

- On the occasion of Earth Day a National Level "**Poster Making Competition**" was conducted in NMNH New Delhi and its regional centres at Mysore, Bhopal, Bhubaneswar and Sawai Madhopur on 22nd April 2012 for the students of IX & X Classes to select the candidate for the Young Environmentalist of the Year Award-2012. The theme of the contest was "**Green Economy: Does it include**

you?” Expenditure for the programme was ₹ 1.10 lakhs.

World Environment Day

- **NMNH, New Delhi** World Environment Day and the 34th Anniversary of the NMNH Foundation Day were organised on 05 June, 2012. On this special occasion Smt Sheila Dikshit, Chief Minister, National Capital Territory (NCT) Delhi conferred “Young Environmentalist of the Year Award -2012 to Shri Tushar Sahay, a class XII student of Lilawati Vidhya Mandir Senior Secondary School, Shakti Nagar, New Delhi. The day also marked with flagging off of the Science Express: Biodiversity Special (SEBS) by the Ministry of Environment and Forests in collaboration with Department of Science & Technology. The Hon’ble Minister of State (I/C) for Environment and Forests, Smt. Jayanti Natarajan along with Chief Minister of NCT of Delhi, Smt. Sheila Dikshit flagged off the train from Delhi Safdarjung Railway Station. The flag off function was coordinated by the NMNH.
- **RMNH Bhubaneswar-** On the occasion of Valedictory function of summer programmes on 5th June, 2012, prizes and certificates were distributed to the participants of Green Cubs and Poster making competition held on 22nd April, 2012. Expenditure for the programme was ₹ 22,000/-.
- **RMNH Mysore-** World Environment Day was organised by a guest lecture by Dr. M. D. Madhusudan on “Wildlife conservation in a Crowded Country”. Expenditure for the programme was ₹ 22,000/-.
- **RMNH Bhopal-** Regional Museum of Natural History (RMNH), Bhopal organized World Environment Day on 5th June 2012. Shri Surinder Singh,

Director General of Police (Jail), Bhopal was the Chief Guest. The Participants of poster making competition and summer vacation programmes attended the session along with their parents. The Chief Guest distributed the prizes and certificates to the winners of poster making competition and participants of summer vacation programmes. Expenditure for the programme was ₹ 22,000/-.

- **Rajiv Gandhi RMNH, Sawai Madhopur-** Prize distribution function was organized on 5th June, 2012 for the winners of Poster Design Contest held on 22nd April 2012. Expenditure for the programme was ₹ 22,000/-.

Summer vacation programmes

- **NMNH New Delhi-** NMNH HQ New Delhi organised Summer Vacation Programme-2012 from 18th to 31st May, 2012. The programme involved orientation by Education staff and interactive sessions with Art and Modelling Units. The activities included Nature Painting, Still Life/Pencil Shading, Creating Art out of Waste, Animal/Bird Mask making, Talk/Slide Presentation on Nature in our surrounding, Nature Quiz, Artificial Flower making, Clay modeling in Round/3D Model, Making your own Relief Model in Clay, Nature Painting Contest and Visit to Nehru Planetarium. Valediction and Prize Distribution was held on 31st May 2012. Expenditure for the programme was ₹ 25,000/-.
- **RMNH Mysore-** The RMNH Mysore organized Summer Vacation Programme for Children. The programme included various activities like Mural painting using M-Seal base and Acrylic paints, Science behind Magic, Model preparation, lecture on Flora & Fauna of Chamundi Hills, Zoo

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visit, Nature trail to Karanji Lake, field trip to Ranganathittu bird sanctuary and skit on Nature. Expenditure for the programme was ₹ 25,000/-.

- **RMNH Bhopal-** The RMNH Bhopal inaugurated Summer Vacation Programme for Children on May 18th, 2012. Students from various schools of Bhopal attended the inaugural session along with their parents. Expenditure for the programme was ₹ 25,000/-.
- **RMNH Bhubaneswar-** The RMNH Bhubaneswar organised Summer Vacation Programme for Children during 22nd-31st May 2012. Children from various parts of Bhubaneswar attended the various programmes. Expenditure for the programme was ₹ 25,000/-.

Van Mahotsava

- **RMNH Mysore-** The RMNH Mysore organised various programmes in connection with Van Mahotsav 2012. The Programme was held at various Schools and Colleges of Mysore during the month of July with an expenditure of ₹ 30,000/-.
- **RMNH Bhubaneswar-** The Museum organised Van Mahotsav during 1st week of July 2012 by planting saplings of different



Fig-53. Winter Nature Camp at Aravalli Biodiversity Park,

species in the campus. No expenditure was incurred in this programme.

International Ozone Day

- **NMNH New Delhi-** To commemorate this day, Poem and Essay Writing Competitions were held for the children from Classes VIII to X of Delhi and NCR schools for sensitizing children about the importance of Ozone Layer and to inculcate awareness about Climate Change and other environmental issues. The theme for Essay writing was: "Protecting our atmosphere for generations to come". The Topics for Poem writing were: Saving the Ozone layer, Effects of Climate change, Biodiversity and Conserve our forests. Expenditure for the programme was ₹ 60,000.
- **RMNH Bhubaneswar-** Written and Oral quiz competitions were organized by the Museum to create awareness among children about the ill-effects of ozone layer depletion, green house gases, global warming etc. for the students of Class VIII to X on the occasion of International Day for Preservation of Ozone Layer on 16th September, 2012. Expenditure incurred for the programme was ₹ 25,000/-.

Wildlife Week

- **NMNH New Delhi-** In order to sensitize the school children on the matters for preservation and to arouse a general awakening in favour of protection of wildlife, schools in Delhi/NCR were invited to NMNH where education staff interacted with them and made them aware about the wildlife of India through guided tour of the museum galleries. This included a talk on wildlife of India followed by exhibit interpretation in the museum galleries and film show in the museum auditorium. The special guided tour was available on prior

- booking and registration by the schools.
- **RMNH Mysore-** To create awareness among the student community about wildlife, Painting competition, Elocution Competition, Film show, and visit to Mysore Zoo were organized at Vivekananda Shikshana Samasthe, Bannur, Mysore. Expenditure incurred for the programme was ₹ 30,000/-.
 - **RMNH Bhopal-** Quiz and Poster making competition on the subject Climate Change and Biodiversity was organized on 24th November 2012 for hearing impaired students. Expenditure incurred for the programme was ₹45,000/-.

Winter Programme

- **NMNH and** its RMNH organised Winter Nature Camp for Children during December 2012 in various Regional venues (New Delhi, Mysore, Bhopal, and Bhubaneswar). Expenditure incurred for this programme was ₹1,20,000/- (₹30,000/- for each Regional Museum).

Budget Allocation and Expenditure

During the current financial year (2012-13, up to end of December 2012), the position of Plan budget expenditure is given in Table-65.

Empowerments of women/ weaker sections

- A large number of educational programmes and competitions for children with **disabilities** were organised by all the Museums under the NMNH located at New Delhi, Mysore, Bhopal and Bhubaneswar. In addition, the NMNH New Delhi organised 3 days special programme for socially excluded community of Sapera.
- **NMNH New Delhi-** Essay writing in Braille, declamation contest for visually challenged students. 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.
- **RMNH Mysore-** Painting Competition, Singing Competition, Modelling Competition, and Museum Visit for 10 days, Prize Distribution Function will be organised during the month of February 2013.

Important Committees/ Commissions

An Advisory Committee common to all Museums under the NMNH was recently

Table-65. Position of Plan Budget Expenditure

(in ₹ lakh)

2012-13			Budget Estimates	Revised Estimates	Total Exp. up to end of Dec 2012	% of Exp. to B.E.
	PLAN		1315.00	1720.00	1034.88	78.70
	Revenue		815.00	820.00	598.62	73.45
		NMNH HQ	410.00	404.00	280.83	68.50
		RMNH	405.00	416.00	317.79	78.47
	Capital		500.00	900.00	436.26	87.25

constituted with Dr. Saroj Ghose (Former President of International Council of Museums) as Chairman and Experts members (non-officials) are

- Prof. S.C. Batla, Head, Department of Botany, University of Delhi
- Dr. S.D. Biju, Associate Professor, Department of Environmental Biology, University of Delhi
- Sh G. S. Rautela, Director General, National Council of Science Museums, Kolkata

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; Indian Council of Forestry Research and Education (ICFRE), Dehradun; Indian Institute of Forest Management (IIFM), Bhopal; and Indian Plywood Industries and Training Institute (IPIRTI), Bengaluru.

Progress of activities undertaken by various institutes

Indira Gandhi National Forest Academy (IGNFA), Dehradun

Indira Gandhi National Forest Academy (IGNFA) is the training centre of Indian Forest Service (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 Forest Research Institute (FRI) campus in Dehradun. This institution earlier functioned as Indian Forest College during 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.

The following is the brief account of the main activities during the financial year 2012-13:

Mid-Career Training Programme

- Started in the year 2012-13, the Academy this year has conducted three Phase-V Mid-Career Training Programmes.
- 2011-13 Indian Forest Service Probationers batch underwent Indian Military Academy attachment for Weapons' Training, Horse-riding and Swimming

The Convocation of 2011-13 batch

- The 2011-13 batch of Indian Forest Service Officers passed out in August 2012. The Convocation Ceremony was held in August 2012, in Convocation Hall of FRI building. As done last year, this year award of 'Hari Singh Fellows' was given to four shortlisted Probationers for pursuing specialization in wildlife/ and Remote Sensing and Geographic Information System (GIS).

Coordination Training Programmes

- During the current year, IGNFA undertook three coordination training programmes for the three All India Service Officers. The

four days' training programmes for Indian Administrative Service (IAS), Indian Police Service (IPS) and IFS Officers included one day field visit to Rajaji National Park. These training programmes were well received.

2011-13 batch of IFS trainees

- Four members of this batch resigned to join other services. The batch size is currently 67. 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 on Her Excellency, the President of India. They have undergone South & West India Tours and would be undergoing East, Central and Working Plan Exercise.

Induction Training

- Induction training of forest officers inducted into the Indian Forest Service by promotion from State Forest Service began 7th January, 2013.

Reunion of Old batches

- One reunion workshops for the forest officers of 1982 batch were held in the Academy during the year. In this workshop, the 'Green India Mission' was discussed and the Probationers interacted and benefitted from the experiences of senior officers. One reunion workshop for officers of 50 years of Service was held during 8-9 May, 2012.

Training of members of Higher Judiciary and Indian Revenue Service Officers

- A three day sensitization course for members of higher judiciary was held in the month of November, 2012 in which 22 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, 2013.

New Batch of 2012-14 Course

- Eighty three Probationers of IFS 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, 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 (upto 31st Dec., 2012)

- One fresh batch (course 2012-14) commenced at Central Academy for State Forest Service (CASFOS), Dehradun with effect from 07.09.2012 for Induction training in the form of "Two year Diploma Course" for the newly recruited SFS Officers of various States/Union Territories.
- One batch (course 2011-13) commenced from 14.07.2011 of newly recruited SFS Officers is undergoing training at Central Academy for State Forest Service (CASFOS), Dehradun and two batch (course 2011-13 & course 2012-14) commenced from 21.07.2011 & 05.01.2012 respectively are undergoing training at Central Academy for State Forest Service (CASFOS), Coimbatore.

- One batch (course 2010-12) of newly recruited SFS officers passed out from CASFOS, Dehradun on 30.06.2012.
- Three fresh batches (course 2012-14) commenced from 02.07.2012/ 09.07.2012/ 28.08.2012 respectively at Central Academy for State Forest Service (CASFOS), Burnihat (Assam), Forest Rangers College, Balaghat (Madhya Pradesh) & Forestry Training Institute, Sundernagar (Himachal Pradesh) for Induction training in the form of "Eighteen months certificate course" for the newly recruited FROs of various States/ Union Territories.
- Two batches (course 2011-12) of newly recruited FROs commenced from 01.07.2011 and 06.05.2011 respectively are undergoing training at Forest Rangers College, Balaghat (Madhya Pradesh) and Uttarakhand Forestry Training Academy, Haldwani (Uttarakhand). One batch (course 2011-13) commenced from 15.11.2011 is undergoing training at CASFOS, Burnihat (Assam) & one batch (course 2012-13) commenced from 14.02.2012 at Andhra Pradesh Forest Academy, Dulapally (Andhra Pradesh) respectively.
- One batch (course-2010-12) of newly recruited FROs passed out from CASFOS, Burnihat (Assam) on 27.04.2012.
- Sixty two Participants attended in four thematic area General Refresher Course, each of two weeks duration, for in-service SFS Officers at CASFOS, Dehradun, Burnihat and Coimbatore.
- Fifty one participants attended three thematic area General Refresher Courses, each of two weeks duration for in-service FROs at Eastern Forest Rangers College, Kurseong/Central Academy for State Forest Service ,Burnihat.

- Thirty two participants attended in three one week workshop on community Forestry and JFM/ Policy legal issues in Forestry & wildlife for inservice FROs at Eastern Forest Rangers College, Kurseong/ Central Academy for State Forest Service, Burnihat.
- Ninety one participants attended in seven Workshops, each of one week duration, on workshop community Forestry & JFM/ Human resource management Wildlife Management/ Training of Trainers/ Legal issues in Forestry for in-service SFS Officers at CASFOS, Dehradun/Coimbatore.
- Around 1900 participants participated in **sixty nine General Refresher Courses**, each of two weeks duration conducted for in-service Forest Frontline Staff (Deputy Rangers, Foresters & Forest Guards) through 49 Forestry Training Institutions of 29 States.
- Around 80 participants participated in **Two Theme based Workshop** of one week duration conducted for in-service FROs through State Forest Training Institute.
- Forty one Master Trainers participated in two weeks Master Trainers Training courses funded by Japan International Cooperation Agency (JICA) Project conducted at CASFOS, Dehradun.
- 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 5th 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.

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- 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.

Budget Outlay and Expenditure

12 th Plan Outlay :	₹ 38.30 crore
Allocation for 2012-13 :	₹ 4.83 crore
Expenditure during 2012-13 : (till 27.12.2012)	₹ 3.68 crore

Indian Institute of Forest Management (IIFM), Bhopal

Brief Objectives

The Institute offers three academic programmes, Post Graduate Programme in Forestry Management (equivalent to Masters Degree), Fellow Programme in Management and M.Phil (Natural Resource Management). The Institute is also recognised as a Nodal Centre for Research by Forest Research Institute, Deemed University (FRI), Dehradun for Doctoral programme.

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) 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).

Activities of PGDFM 2011-13

The 89 students of PGDFM 2011-13 batch completed their summer internship during April 05 – June 08, 2012 in 49 organisations for 10 weeks out of the 151 internship offers received.

Field Work – II component for PGDFM 2011-13 batch was organized during 25.11.2012 to 8.12.2012, wherein the *Environmental Management Group* was exposed to the concepts of environment friendly energy

production, environmental care, energy conservation, ecological aspects, wildlife management, ecotourism, research and conservation aspects, nursery management etc. in Haryana and Uttarakhand. Similarly, *Conservation and Livelihood Management Group* was taken to Uttarakhand giving them exposure to many conservation and livelihood aspects such as water conservation, biodiversity conservation, sustainable agriculture, environmental sanitation, depot management and timber trading, silvicultural aspects etc. and *Development Management Group* was taken to Madhya Pradesh, Uttar Pradesh, Rajasthan and Uttarakhand to get firsthand knowledge about socioeconomic analysis, opportunities and challenges in development sector, women empowerment aspects, watershed development, organic farming, entrepreneurship development, capacity building, land productivity development and rural infrastructure development.

In the batch of PGDFM 2011-13, as on 31st December 2012, 60 students out of 89 have been placed in 16 companies (Table-66). The placement process is on and rest of the students are likely to get placed by January end.

Activities of PGDFM 2012-14

The programme of PGDFM 2012-14 commenced from July 02, 2012 with 89 students selected following the reservation policy as per the Government of India norms. For admission of this batch, 1607 applications were received and 516 candidates were shortlisted for Group Discussions/Personal Interview conducted at Bengaluru during April 9-10, 2012 and at Bhopal during April 9-12, 2012.

Field work – I component for PGDFM 2012-14 batch was organized during 10.12.2012 to 28.12.2012. Students were given

Table-66. Number of Students placed in Various Companies after Completing Summer Internship

Name of the organization	No. of students placed
Madhya Pradesh Eco Development Board	2
Sambodhi Research and Communication Private Limited	2
NABARD Financial Services	2
NR Management Consultants India Private Ltd	1
Access Development Services	2
SRIJAN	4
Neuerth India Private Limited	6
Annapurna Microfinance Private Limited	3
Greenply Industries Ltd.	1
Madhya Pradesh Forest Department	4
ICICI Foundation	3
FINO Paytech Limited	10
Sahyog Microfinance	4
Society for Elimination of Rural Poverty, Andhra Pradesh	10
Odisha Rural Livelihood Project	5
Sudiksha Knowledge Solutions	1
Total	60

exposure to forestry operations management, fundamentals of forestry, wildlife conservation, ecotourism, social aspects of Joint Forest Management (JFM), forest settlements etc. in Madhya Pradesh, Gujarat and Maharashtra.

Admissions

The admission announcement for 2013-15 batch was published in leading national dailies. A total number of 1546 applications were received with CAT registration number.

M.Phil (Natural Resource Management)

The programme is affiliated to Saurashtra University, Rajkot, Gujarat. The degree shall be granted by the Faculty of Science, Saurashtra University, Rajkot and the course will be conducted at IIFM Bhopal.

The programme of M.Phil. (NRM) 2012-13 commenced from July 02, 2012 with seven candidates selected against the admission announcement. During the admission process, the Institute received 37 applications, out of which 26 candidates were called for Group Discussion/Personal Interview.

Fellow Programme in Management (FPM)

The FPM 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 offers financial assistance and contingency grants to selected non-sponsored candidates.

Five students have been inducted in the FPM 2012-16 batch which commenced from July 02, 2012. During the admission process, the Institute received 81 applications, out of which 54 candidates were called for Group Discussion/Personal Interview.

Ph.D. Programme

The Institute functions as one of the research centers of the FRIDeemed University for higher studies leading to Doctor of Philosophy. Currently, 14 candidates are pursuing doctoral programme under the centre of which three candidates joined this year.

Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru

Training is an important tool to facilitate the industries for efficient utilization of manpower resources, increase the productivity and reduce the overall cost of production. Human Resources Department 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 is the only training institute of its kind in the county in the field of mechanical wood industries.

Progress/Achievements made during the year

Post-graduate Diploma in Wood and Panel Industry Technology:

During the period, 23rd Training Course for One year Post-graduate Diploma in Wood and Panel Industries Technology for graduates in Science and Engineering was conducted wherein all the 19 candidates completed the course successfully and 100% placement was arranged through Campus selection process.

Short term vocational training courses

Nineteen training courses on Resin manufacture and Plywood Technology were conducted in Bengaluru, IPIRTI Field Station, Kolkata and IPIRTI Field Station, Mohali for fresh graduates and technicians from plywood factories.

International Training Course:

A course on "Plywood Manufacturing Technology" was conducted for ten Trainees from M/s. Rai Plywoods (K) Ltd., Kenya at IPIRTI, Bengaluru during 2012

Special Training Course for Students of Kannur University

One training course was conducted on Saw milling & Saw Doctoring, Wood working & Wood finishing for M. Sc. Final year students from Kannur University, Kerala. Ten students attended the course.

Training Workshop for IFS Officers

Two training courses were conducted for senior IFS officers from various states and union territories of India.

New Facilities Established At Institute

Fire check door testing facility

Keeping future requirements of building bye-laws in our country and to facilitate testing of fire check doors, the facility has been 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. Door samples received from outside agencies were tested as per national/ international standards.

Formaldehyde emission/VOC measurement chamber

It is used to evaluate the organic emissions from wood and wood based panel materials. This helps in developing techniques for screening of products for organic emissions. Data useful to manufacturers and builders for assessing the product emissions can be developed including the control options for further improvements in products

International Conference

An International Conference on "Future of Panel Industry-Challenges and Key Issues"

was held during 26th – 28th September 2012 at IPIRTI campus, to commemorate the Golden Jubilee Year of the Institute. The Conference gathered nearly 150 - 200 experts from the Scientific, Technical and Industrial communities and exchanged information on the latest advances and future challenges in the field of plywood and panel industries. Address by Chief Guest Hon'ble Secretary, Dr.T.Chatterjee, Secretary, MoEF, followed by Address by Guest of Honours Dr.AbdLatifMohmod, D.G, FRIM, Malaysia, Dr.MaharajMuthoo, President, Roman Forum, Shri. SajjanBhajanka, President, FIPPI, Mr.Ladislaus Dory, President, European Panel Federation (EPF) were delivered during inaugural session. Speakers from India and Abroad presented Scientific Research papers on the theme of the Conference viz. Status of Panel Industry-Country Scenario, Raw Material: Demand & Supply, Certification, Policy & Legal Issues, HRD & Marketing, Technological Innovation and Value Addition.

Agreements with Countries/International Organizations

- An MOU signed between IPIRTI and WKI Germany to promote "co-operation in the field of research and education
- IPIRTI signed MOU with M/s. Habitate for humanity international (HFHI) Nepal, for transfer of technology on bamboo mat corrugated sheet and bamboo mat ridge cap
- An agreement was signed between IPIRTI, Sarda plywood industries ltd (SPIL) of India and faculty of forestry, bayview flowers ltd of Canada for R &D related to the commercialization of biopanel manufacturing from rice straw and digestate using green adhesives.

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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

- **XIII M.Sc. (Wildlife Science) Course, June 2011 to June 2013.** The XIII M.Sc. Wildlife Science course commenced on June 29, 2011. A total of 14 students (12 Indian and 2 foreign students) joined the course. The students were taken for High Altitude Tour to Kedarnath Wildlife Sanctuary and Nanda Devi Biosphere Reserve from April 30, 2012 to May 10, 2012. They were taken to Southern India (Tamil Nadu & Kerala) from October 16, 2012 to November 5, 2012 for Conservation Practice & Management Tour to train them on different wildlife techniques and provide knowledge regarding identification of flora & fauna. The students also defended their dissertation proposals during the reporting period.
- **XXXIII Post Graduate Diploma Course in Advanced Wildlife Management concluded, September 1, 2011 to June 30, 2012.** The course commenced on September 1, 2011 at the Institute with nine officer trainees. During the reporting period, the Management Term Paper Exercise was held at Kanha National Park

in Madhya Pradesh from April 4-18, 2012. The Management Plan Exercise was held at Dandeli - Anshi Tiger Reserve in Karnataka from May 3 - June 1, 2012. All the officer trainees have successfully completed the course and seven of them were awarded the Honours Diploma for securing 75% and above marks.

- **XXXIV Post Graduate Diploma in Advanced Wildlife Management, September 1, 2012 to June 30, 2013.** The XXXIV Course commenced on September 1, 2012 for a duration of 10-month at this Institute with a total of 20 officer trainees of the rank of Deputy Conservator of Forests/Assistant Conservator of Forests and equivalent levels. Among them, 17 officers under training representing different States within country and three foreign nationals (2 from Nepal and 1 from Bangladesh) joined the course. These foreign nationals are sponsored by the Global Tiger Forum, New Delhi.
- **XXVIII Certificate Course in Wildlife Management, November 1, 2012 to January 31, 2013.** The course commenced on November 1, 2012 for the duration of 3 months. Ten officer trainees (2 each from Madhya Pradesh, India; Malaysia, Bhutan; 1 each from Lao PDR; Nepal; Vietnam; and Thailand) joined the course. The trainee officers were taken to Haridwar on November 11, 2012 to see Science Express Biodiversity Special Train. They were taken to Dhanaulti-Kaddukhal area on December 23, 2012 to familiarize them to the vegetation, altitudinal succession of vegetation and management of Eco-park. The officer trainees were taken for their Orientation-Cum-Techniques Tour at Sariska Tiger Reserve and Keoladeo National Park, Rajasthan from November

25, 2012 to December 7, 2012. The officer trainees were taken to various protected areas in West Bengal, such as Mahananda Sanctuary, Senchal Sanctuary, Gorumara National Park, Jaldapara Wildlife Sanctuary, Buxa Tiger Reserve, Darjeeling Zoo, Ramsar sites at Bhitarkanika and Chilika and a visit to Nandankanan Zoological Park for their Management Tour during January 11-25, 2013. The course concluded on January 31, 2013. All the officer trainees successfully completed the course and awarded certificates in a valedictory function held on 31st January, 2013.

Meetings, Workshops, Seminars and Other Activities

- **Training workshop on “Mainstreaming biodiversity in impact assessment” for Indian Forest Service Officers, Dehra Dun, August 27–28, 2012.** Training workshop conducted by Wildlife Institute of India for the IFS officers was sponsored by the Ministry of Environment and Forests, Government of India, New Delhi. The objectives of the workshop were: (i) improving the mechanisms for mainstreaming biodiversity in impact assessment for sound decision making and long term gains for conservation; (ii) improve better appreciation of the issues and conflicts related to developments in ecologically sensitive areas; and (iii) review options for professionalizing Environmental Impact Assessment (EIA) for positive outcomes for biodiversity. A total of 26 Indian Forest Service officers participated in the workshop.
- **XXVI Annual Research Seminar (ARS) of WII, Dehradun, September 17-18, 2012.** Prof. R. Sukumar, Chairman, Training, Research and Academic Council (TRAC), chaired the Annual Research Seminar. A total of 18, presentations were made in five technical sessions. The presentations were based on the ongoing/completed research studies. About 225 delegates 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 P.G. Diploma Course officer trainees of WII.
- **Two-day workshop for IFS officers on “Ecodevelopment for Biodiversity Conservation: Assessment and way forward”, Dehradun, December 3-4, 2012.** The course was conducted by Wildlife Institute of India for the IFS officers sponsored by the Ministry of Environment and Forests, Government of India, New Delhi. A total of 21 officers participated in the course. The course was planned keeping in mind the fundamental principles and latest happenings in ecodevelopment in the field with reference to the empowerment of local communities and protection of Forests/Protected Areas/ Natural Ecosystems. The entire course was designed in the form of panel discussions.
- **A three-day Training Programme on ‘Wildlife Conservation: Issues & Concerns’ for Representatives of Indian Army in the State Boards for Wildlife, Kabini River Lodge, Karnataka. December 12-14, 2012.** A total of 14 Senior Army Officers, mostly of the rank of Brigadier, who represent the Army in various State Boards for Wildlife, participated in the programme. Col. Michael James,

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- Director, Policy (Ecology), Land Works and Environment, Directorate Integrated Headquarter of Ministry of Defence (MoD) (Army) also participated from the Army Headquarters. Shri V.B. Sawarkar, Former Director, WII, and Lt. (Retd.) Gen Baljit Singh were invited as the resource persons. Shri B.G. Hoshmath, APCCF (Project Tiger) Karnataka inaugurated the programme. The training programme included indoor interactions as well as field tours including nature walk guided by the Head Naturalist, Jungle Lodges and Resorts.
- **Celebration of World Environment Day, Dehradun, June 5, 2012.** A joint program of the World Environment Day on the year's theme "Green Economy: Does it include you?" with the Indian Society of Remote Sensing, Dehra Dun Chapter (ISRS-DC) and Indian Meteorological Society, Dehra Dun Chapter (IMS-DC) was organized at the Institute on June 5, 2012. The event was attended by faculty and students of Indian Institute of Remote Sensing and Wildlife Institute of India and members of ISRS-DC. Shri P.R. Sinha, Director, Wildlife Institute of India (WII) while addressing the gathering discussed about the issue of equity. He stressed that the major problem of wildlife sector is the approach towards conservation. Speaking about the ecotourism practices, he said that ecotourism requires lot of skills and investment. A popular talk was delivered by Dr. Anand Sharma, Director, Meteorological Centre, IMD, Dehradun on 'Weather & Climate'. A documentary on "Monsoon - India's God of Life" was also screened and a poster exhibition was organized displaying significant case studies and applications of remote sensing technology in various fields of natural sciences.
 - **Celebration of Hindi Fortnight, Dehradun, September 25, 2012.** Hindi Fortnight was celebrated in the Institute. A lecture was delivered by Dr. V.P. Uniyal, Scientist, WII on this occasion. A Hindi poem recitation competition was also organized for the staff, faculty members, researchers and the students. The winners were awarded for their performance.
 - **Celebration of Wildlife Week, Dehra Dun, Dehradun, October 1, 2012.** The XWII-Friends of the Doon 'Wildlife & Environment Quiz 2012' – a collaborative activity of Wildlife Institute of India and Friends of Doon Society was organized on October 1, 2012 at Wildlife Institute of India to mark the celebrations of the Wildlife Week 2012. Fifteen schools participated in preliminary round and six of them qualified for the final round. The final quiz had six rounds viz Uttarakhand, Guess who, Audio Visual, Landscapes, Brain Strain and Current Events as Rapid Fire Round. Ann Mary School won the WII-FoD Rolling Trophy, Book Prize and Sameer Ghosh Memorial Nature and Wildlife rolling trophy.
 - **Participation of WII in CoP-11, Hyderabad, October 1-19, 2012.** Hyderabad hosted the COP-MOP6 Cartagena Protocol on Biosafety and XI Conference of Parties (COP11) on Convention on Biological Diversity. It was organised by the Ministry of Environment & Forests, Government of India. The Institute participated in an 'Interactive Fair on Biodiversity' during CoP-MoP6 and CoP 11 held at the HICC-HITEX Complex in Hyderabad during October 1-19, 2012.
- The Institute showcased its achievements and ongoing activities and displayed its commitment to the conservation of

biological diversity. The Institute was also given the responsibility to showcase the activities of member organizations of Indian National Committee of International Union for Conservation of Nature (INC - IUCN). Four booths were arranged for INC - IUCN. A large number of faculty members from the Institute participated in the deliberations held during the CoP11.

Go4BioDiv is an International Youth Forum where young individuals from different parts of the globe come together to share their experiences, discuss about global environmental issues and engage in the UN Conferences on Biodiversity (CBD-CoP). It aims at raising awareness about the interdependencies of biological and cultural diversity as well as intergenerational responsibilities for the biodiversity conservation. In October 2012, Go4BioDiv took place for the third time - parallel to CoP 11 in Hyderabad, India. It was hosted by the Ministry of Environment and Forests (MoEF), Government of India and carried out by the Wildlife Institute of India (WII) with support by various international partners. In accordance with the COP 10 decisions (Nagoya mandate/Aichi targets), the theme of Go4BioDiv 2012 was 'Conserving coastal and marine biodiversity for sustaining life and livelihoods'. Therefore, Go4BioDiv brought together young people from the most outstanding marine and coastal sites our planet has to offer. There are 35 messengers aged 18 to 29 and live or work in over 20 different marine World Heritage Sites around the world or in one of the nine coastal states and one Union Territory of India. They joined CoP-11 in Hyderabad from October 16 to 19 during the High-Level Segment to present their messages

to decision-makers and the wider public via a powerful youth declaration, creative performances involving street theatre and a colourful exhibition and various side-events. The whole event was prepared and accompanied by a strong virtual exchange via an online platform and an e-coaching course, creative tasks as well as extensive press work.

Ms. Jayanti Natarajan, Hon'ble Minister of Environment & Forests, Government of India released the special Go4BioDiv brochure during the UNDP Award Ceremony.

On the occasion of the CBD CoP-11 at Hyderabad, the Ministry of Environment & Forests, Government of India decided to release commemorative stamps. For this purpose, a theme '*Endemic Species of Indian Biodiversity Hotspots*' was chosen and Wildlife Institute of India was assigned the responsibility to coordinate the work with the Department of Posts, Government of India. Dr. Manmohan Singh, Prime Minister of India released the set of 4 commemorative stamps and the '*First Day Cover*' during the inaugural session of the CBD CoP-11 High Level Segment in Hyderabad on October 16, 2012.

Presently, biodiversity data and information lies dispersed and distributed amongst various individuals and institutions. This opaqueness has resulted in the duplication of efforts on the one hand and is also impairing the progress of India emerging as a leader in the field of biodiversity informatics. To address this situation, the MoEF and National Biodiversity Authority embarked on the process of developing a National Biodiversity Information Outlook, whose prime responsibility was assigned

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to the Wildlife Institute of India. The WII team developed the National Biodiversity Information Outlook (NBIO), whose goal is to (1) Identify barriers in the progress of developing biodiversity informatics in the country. (2) Prioritize biodiversity data discovery and publication and (3) Develop a road map for channelizing investments in this emerging area so that they become scientifically, ecologically, economically and socially relevant.

The NBIO is an overarching framework of collaboration with an aim to facilitate free and open access to biodiversity data. The NBIO was launched during the CBD-CoP-11 at Hyderabad by Dr. K. Kasturirangan, Member, Planning Commission, Government of India. India is the first country in the world to develop a National Biodiversity Information Outlook.



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 objective, 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.

Brief details about these Centres of Excellence are as follows:

Centre for Environment Education (CEE), Ahmedabad

Introduction

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 24th July, 2010 in partnership with MOEF and ArcelorMittal.

The Paryavaran Mitra programme aims to guide, facilitate, capacity building among students through curriculum-linked activities and co-curricular action projects to take positive environmental action at individual, community, national and global level. A Handbook has been developed and is being translated in various languages to help teachers facilitate teaching and learning.

Paryavaran Mitra represents Hand print action. Hand print is a measure of ESD action; action that is directed to decrease the

human footprint and make the world more sustainable.

During 2011-2012 the programme with more than 160 partnerships has enrolled and reached 2,19,888 schools across the country with material in 13 languages. A felicitation of best performing schools, districts and students was organized during United Nations Convention on Biodiversity Committee of Parties (UNCBD COP-11) organised at Hyderabad in October 2012.

National Green Corps (NGC)

CEE implements NGC programme in 15 States and two Union Territories as resource agency.

With a view to strengthen the monitoring and reporting regular meetings with Nodal Agencies for planning and strengthening the NGC programme were held. This helped in planning annual activities of the NGC. Twenty state and district level training programmes were facilitated and around 25 events for NGC schools on various environmentally significant days were organized. Two per cent schools were visited for monitoring. Outreach events at various levels were also organized.

Biodiversity Conservation

Science Express Biodiversity Special (SEBS)

Science Express is a unique, state of the art exhibition train that has done 4 runs across the country bringing science awareness to the doorsteps of millions of children, youth and the other citizens. In its current phase, the Biodiversity Special train was flagged off on June 5, 2012 by Delhi Chief Minister Smt. Sheila Dikshit along with the Minister of Environment and Forests Smt. Jayanthi Natarajan. CEE has specially designed eight

coaches for the SEBS. Through visuals, models, audio-video and interactive exhibits, it portrays India's unique biodiversity in national and eco-regional thematic modes, its relationship with humankind, 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 is targeted at non-specialists and common citizens, especially school and college students, teachers and families. The train completed its journey on the 22nd December 2012 at Ahmedabad. Over 25 lakh visitors saw the exhibition at 52 stations. Science Educators, youth and CEE staff conducted platform activities and teacher training programmes at the stations. CEE conducted a visitors' response study and developed a short film on the train and its journey. This film was showcased at the UNCBD COP11 as the Brand Ambassador of this event.

The next phase of the train's journey will focus on the same theme.

Education for Sustainable Development (ESD) Conference for UNCBD COP 11

CEE in its role of being the Nodal Agency for implementing the United Nations Decade of Education for Sustainable Development (UNDESD), organized an International Conference titled "International Conference on Biodiversity Conservation and Education for Sustainable Development – Learning to Conserve Biodiversity in a Rapidly Changing World", at Hyderabad. A key outcome of this conference was the signing of an Memorandum of Understanding (MoU) between CEE and the CBD COP Secretariat to work together in developing an action plan on education for biodiversity conservation.

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National Biodiversity Authority (NBA) Hand Print pledges

A nationwide campaign to generate awareness through pledges for biodiversity conservation was taken up in partnership with National Biodiversity Board. More than 2 million pledges were collected across the country. CEE presented the Handprint concept developed by it, to delegates at COP, which has been adopted as a symbol representing positive action towards sustainability.

Gangetic Dolphin Conservation Programme

CEE with the support from the Ministry has initiated a two-year project on Ganges River Dolphin Conservation Education Programme in the north and north-eastern region of India. Twenty locations in the four States – UP, Bihar, Assam and West Bengal were identified. Each location has 25 clusters where teacher training programmes, “Dolphin Melas: were conducted in all the 20 identified locations. In addition two Dolphin camps at Bhagalpur (Bihar) and one on the banks of Kulsi River (Assam) were conducted. A Teachers Manual in four languages was developed and these were distributed at the training programmes.

CEE initiated a People’s Biodiversity Registration process at thirty villages in Guru Ghasidas National Park, and seven villages in Bastar and Rajnandgaon districts of Chattisgarh in 2010.

National Environmental Awareness Campaign

National Environment Awareness Campaign (NEAC) is a national programme initiated by the Ministry of Environment and Forests (MoEF) in July 1986. One of the earliest flagship programmes of the Ministry, NEAC aims to create environmental awareness across

the country and inspire citizens to participate in the protection of the environment.

CEE played host for 4 regional committee meetings, each of which was organised during 17th–21st October in 4 cities viz Ahmedabad, Chandigarh, Delhi and Guwahati. In these meetings too, a CEE representative, in the capacity of a committee member, along with other committee members helped in the final short listing of proposals to the Ministry representatives for the sanctioning process.

ENVIS

One annual issue of the newsletter Education for Change (EfC), with special focus on Environmental Education was brought out as part of the activities of the ENVIS Centre on Environmental Education. The website “Green Teacher’ was regularly updated. The process of migration of the website www.greenteacher.org to the NIC sever is on.

Journal of Education for Sustainable Development

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. Two issues of this journal were brought out this year.

C.P.R. Environmental Education Centre (CPREEC)

Introduction

C.P.R. Environmental Education Centre (CPREEC) is a Centre of Excellence of the Ministry of Environment and Forests, Government of India, jointly set up by the Ministry and the C.P. Ramaswami Aiyar Foundation.

To create awareness among various stakeholders about current environmental issues and our responsibilities towards the preservation of our environment. The programmes have been conducted in the States of Andhra Pradesh, Goa, Karnataka, Kerala, Odisha, Maharashtra and Tamilnadu, Union Territories of Andaman and Nicobar Islands and Puducherry

Progress /achievements made during the year

Environmental Education for Teachers

Teachers selected by the state Departments of Education in the states of Andhra Pradesh, Karnataka, Kerala, Goa, Odisha, Maharashtra and Tamilnadu were trained to teach environmental concepts. Updated resource materials were distributed.

Green Schools of India & Kindness Kids (Environmental Education Animal Welfare

CPREEC's Green Schools of India (GSI) is an environmental management programme for school students, which aims to convert environmental awareness and education into action. This scheme involves students from schools in five areas of environmental management: reducing energy and water consumption, waste management, greening the campus and animal welfare. Several schools have introduced the concept of GSI and have reduced their consumption of water and energy. Composting pits for effective waste management, rain water harvesting pits to harness nature's bounty, and greening the campus are included in their activities. Some schools maintain herbal gardens. Green School Awards are given annually to the best performing schools.

Biodiversity Conservation Education

Workshops on biodiversity conservation

education were conducted for teachers, students, women and villagers in the states of Andhra Pradesh, Karnataka and Tamilnadu. 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 Tamilnadu. Orientation programmes for school students were organized at the sacred grove sites to motivate them towards sacred grove conservation. Strengthening of bio-fencing and casualty replacement of saplings was carried out in the existing sites. CPREEC has established a nakshatra van on the lands of the Meenakshi Temple at Madurai. This has been extended to a grove of kadamba and mahua trees, sacred to Goddess Meenakshi.

Women and the Environment

CPREEC trained women of selected villages in waste management, vermicomposting, organic farming, health and nutrition in the states of Tamilnadu and Karnataka and the Union Territory of Puducherry. 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.

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 the Nilgiris, Coimbatore, Thiruppur

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and Erode in Tamilnadu, Wayanad in Kerala, Mysore and Chamraja Nagar districts in Karnataka. The annual Anti Plastic Campaign of CPREEC was organized at the Botanical Garden in Ooty in the Nilgiris. Ozone day celebrations and wildlife week celebrations were also organized. A special cleaning up campaign was organised in collaboration with the Tamilnadu Pollution Control Board to mark World Environment Day.

As part of the Tamilnadu Biodiversity Conservation & Greening Project, Department of Forests, Government of Tamilnadu CPREEC organised a series of awareness programmes on Participatory Rural Approach in the Nilgiris.

Exhibition

An exhibition on COASTAL AND MARINE BIODIVERSITY was designed and put up at Chennai. The same exhibition was put up at the Science Festival organized by the Government of Tamilnadu. A booklet on *Coastal and Marine Biodiversity* was distributed free to all the visitors. Another exhibition on the FLORA and FAUNA of the RAMAYANA was displayed at Chennai in February 2013 in connection with the International Festival, Conference and Exhibition on the Ramayana.

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

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, Tamilnadu and the Union Territories of Andaman & Nicobar Islands and Puducherry.

Research and Surveys

CPREEC also analysed water samples collected from various river basins of Tamilnadu. The samples were analysed 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.

National Green Corps (NGC)

CPREEC is the Resource Agency (RA) for NGC in the states of Andhra Pradesh, Karnataka, Kerala, Goa, Odisha, Tamilnadu 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, Kerala, Odisha, Tamilnadu and the Union Territory of Puducherry.

CPREEC organised a National Workshop for State Nodal Agencies (SNAs) and Resource Agencies (RAs) on Testing of Manual for Monitoring and Reporting National Green Corps (NGC) activities of the Ministry of Environment & Forests, Government of India at New Delhi on August 31, 2012.

CPREEC in collaboration with the Goa State Council for Science & Technology organised an Art Mela on Biodiversity for NGC school students at the Miramar Science Centre on November 16, 2012.

Biomedical Waste Management

The workshops were organized in collaboration with the Indian Medical Association, concerned State Pollution Control Boards, Medical Colleges and Pollution Control Committee.

National Environment Awareness Campaign (NEAC)

CPREEC organized a National Level Interactive workshop of Regional Resource Agencies (RRAs) for effective implementation of NEAC – 2012-13 at New Delhi on May 30, 2012.

Another Workshop for better implementation of National Environmental Awareness Campaign (NEAC) programme for the RRAs of Eastern & Southern Region was organized at Chennai on September 24, 2012. During the meeting an Expert Group for Effective Implementation of NEAC was constituted.

COP 11

CPREEC designed and developed exhibition panels on **Coastal and Marine Biodiversity of India** in collaboration with the National Biodiversity Authority. A booklet on the topic of the exhibition was generated and distributed free to the participants of COP 11 at Hyderabad.

Centre for Ecological Sciences (CES), Indian Institute of Science (IISc), Bengaluru

Introduction

The Centre for Ecological Sciences (CES), has been involved in cutting-edge research in diverse areas of ecology and evolutionary biology and also those with considerable impact on the long-term survival of species and ecosystems, with focus on the Western Ghats.

The research areas of CES ranges from the social behaviour of single-celled organisms to the largest land mammal – the Asian elephant, besides questions concerning climate change. CES employs diverse tools from molecular ecology to mathematical modelling of ecosystems. CES works on five thematic areas in project mode which are discussed one after the other in the paragraphs that follow:

Community, Forest and Wildlife Ecology

CES has been conducting a large scale survey of herpetofauna in the Western Ghats. There is insufficient information on the geographic distribution of many taxa including frogs, lizards and snakes. Data on distribution are crucial for systematic conservation planning especially in assessing the efficacy of the current protected areas and also in identifying areas of conservation importance outside the existing protected area network. CES is creating a comprehensive distributional database for amphibians (frogs) and reptiles (lizards and snakes) through primary field surveys and spatial modeling. CES has been working extensively on understanding elephant behaviour with a view towards better management of elephant populations. The knowledge gained from this research is targeted towards understanding inter-elephant interactions which will help in better delineation of reproductive episodes in male and female elephants. The dynamics of the long-term plot in Mudumalai continues to be monitored and research on this plot will be celebrating its silver jubilee next year. In this long-term plot, the spread, distribution and impacts of the thicket-forming invasive shrub *Lantana camara* in Mudumalai, Western Ghats was investigated. Using a long term data set from a large permanent plot and a landscape-wide study, it was inferred that rainfall, fire, proximity to drainages and native species

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influenced lantana spread and distribution. Bats are an important and yet neglected taxon that has often been treated as vermin. However, research has shown that bats are extremely important in controlling insect populations and are therefore important features of agricultural landscapes. The diversity of bats was investigated at Kudremukh National Park in Karnataka and special attention was paid to *Megaderma spasma* which is a unique bat that appears to be a specialist on katydid species.

Behaviour and Evolution

Investigations on a model wasp system that has been the hallmark of CES's work in behaviour over the last 28 years has shown that there is a reproductive queue in the model wasp *Ropalidia marginata* in which there is no overt conflict. This suggests that this process is adaptive in the tropics, where threats from conspecific usurpers from outside the colony are likely to be present throughout the year. Differences between temperate wasp species and tropical wasp species are important to be understood in the advent of climate change. How insects interact with plants is an important feature of understanding the evolution of plant signals meant for the essential services of pollination. In a seasonal cloud forest at Bhimashankar Wildlife Sanctuary in Maharashtra, visual signals meant to attract pollinators were measured for the major tree, shrub and liana species. This is the first study within India to examine floral advertisement at a community level. Figs are keystone species in tropical forests. CES has developed several species of figs as model study systems, e.g. the monoecious *Ficus racemosa* and the dioecious *Ficus hispida* and *Ficus exasperata*. CES is in the process of understanding the causes and consequences of asynchrony in within and between-tree reproductive behaviour in figs. Such investigations will have a profound

impact on the biology of these important keystone species. A new model system which consists of a mutualism between termites and their cultivated fungus was established and characterized using molecular genetics. This is one of the most ancient systems of agriculture in the world, and predated human agriculture by millions of years. We have characterized the physiochemical parameters required for the fungus cultivation.

Human and Landscape Ecology

CES has begun investigation of spatial patterns in semi-arid ecosystems where a number of previous studies suggest that they might tip over to desert under the pressure of increased grazing and changing climatic patterns. Our preliminary analysis on quantifying spatial patterns (such as distribution of patch-sizes) has raised questions about the methodology employed in previous studies, and therefore, their conclusions. Work is being carried out to assess the impacts of the invasive species lantana on butterfly diversity and behaviour at Biligiri Rangaswamy Temple Wildlife Sanctuary in the Western Ghats in Karnataka. Earlier research had indicated that lantana contributes to the overall diversity of butterfly species by providing huge amounts of nectar for adult butterflies, most of which can access the nectar owing to the morphology of the flowers. However, behavioural studies at CES suggest that lantana, while being able to provide food resources for at least some butterfly species, may overall reduce the habitat quality for butterfly species by reducing the diversity in vegetation and thereby in the different resources needed in the life cycle of butterflies.

Climate Change

CES has pioneered work on late Quaternary climate change by investigating

the climate profile of this period (40,000 years BPC) using the signatures available in peat bogs in the Nilgiris. This work has been continued with much more sampling of peat bogs over a wider distributional areas in the Nilgiris. Thus our understanding of past climate is being enhanced and will afford benchmark studies for understanding future and present climate change.

Conservation outreach, training and education

CES is aware that conservation outreach, training and education is a vital part of research. With this view in mind, CES faculty have been engaged in giving lectures and conducting seminars in many parts of the country, besides writing up their results and findings in journal as well as popular articles. Over the last year, CES faculty have published 45 journal articles, 4 books, 14 reports, and many popular articles. CES has conducted a workshop on molecular phylogenetics which is the only hands-on comprehensive training workshop of its kind in the country. CES is also in the process of producing an atlas for amphibians and reptiles of Western Ghats, identification of important frog, lizard and snake areas (based on GIS based distribution models), and outreach material in the form of an online atlas, and printed field guides. The world-renowned CES herbarium which houses the Flora of Karnataka is now fully digitized and will be opened to public shortly.

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. It is also involved in issues of academic interest pertaining to mining and environment.

Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore

Introduction

SACON was established in 1990 as a fully funded Centre of Excellence under the Ministry. Its objectives are as follows:

- design and conduct 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 people

Progress / achievement made during 2012-13

During the year, the focus of programs undertaken by SACON was on themes such as species, their ecological requirements and distribution; habitats and ecosystems; and environmental contaminations and assessments. The species, habitats and ecosystems were identified on the basis of threat perceptions and national as well as international priorities. The decade long endeavour on conservation of edible nest Swiftlet in the Andaman Islands, a distinct subspecies, with the purpose of inducing it to settle and breed in customised structures, has been continued with notable success. The newly raised individuals of the species have started visiting these customised structures

and it is expected that they will start building nests in the coming years. This is especially important in view of the recent re-assessment of the species, covering the whole archipelago, showing loss of several wild colonies of the species, mainly due to poaching and other pressures. A study was also initiated on the endangered Narcondam hornbill, a species restricted to the small Narcondam Island.

India has the highest number of cat species i.e. 15. However, small cats do not feature in any major research or conservation planning in the country. Owing to the limited understanding of small cats, a research project for identification of Fishing cat populations for conservation has been taken up. A study on large mammals and birds of Bannerghatta National Park highlights the risks from mining and other such activities around the Park. The study also documents the spread of Lantana and its effects on animals. Appropriate management measures are also suggested.

In Agasthyamalai hills, SACON has initiated a study on the factors that shape the distribution patterns of faunal groups. It aims to document species richness and turnover of reptiles and birds, in view of the altitude and other factors in the Agasthyamalai hills region, and to apply distribution (ecological niche) models on selected endemic species found in the area.

Ecosystem services by birds in various ecosystems, especially forests, are a topic of high scientific interest. The research on avian frugivory and seed dispersal in the shola forests, documents the role of endemic birds such as the Nilgiri Laughing thrush and Nilgiri Wood Pigeon in dispersing endemic tree species, aiding in forest regeneration. In the Nicobar Islands, a program on post-tsunami coastal ecosystem recovery, generated valuable ecological information that could

help identify sites and species for restoration and site-specific measures, thereby ensuring the recovery of the invaluable ecosystems of the islands.

Some development projects may have an impact on biodiversity. In this regard, the possible impacts of approximately 100 irrigation projects on the biodiversity of 23 districts of Andhra Pradesh were assessed by SACON. While documenting the biodiversity in these areas, the threats were identified and site specific (catchment and command areas) management measures were offered. Though Wind farms are generally perceived as being eco-friendly means of generating electricity, there may be site-specific collateral damages. A study, the first of its kind in India, on the impacts of Jangi wind power farm on birds and bats has been progressing well for the last one year. As part of SACON's Environmental Impact Assessment (EIA) works, an ecological assessment of the Liquefied Natural Gas terminal augmentation project at Puthuvypeen (Kerala) was undertaken, which highlighted the collateral damages to the nearby mangroves and the need for appropriate measures to avoid such impacts.

As part of ecotoxicology works, chiefly aiming at unusual bird mortalities and identification of responsible factors, residue analysis in birds from all over the country is being undertaken. In view of the increasing threats from agrichemicals, pesticide residues were compared between organic and chemical farms in a village of Kerala. The study highlights differences in pesticide residues and species composition in the two systems of farming. However, further investigations are to be conducted to corroborate the findings.

Wetlands have remained a priority ecosystem for research and conservation.

During the year, an ecological documentation of the wetlands of Srikakulam in Andhra Pradesh was conducted. The study brings out the conservation values of wetlands in the district, and highlights the potential threats and the need for conservation measures.

Ministry of Environment and Forests (MoEF) ENVIS node on wetlands of India, which collates and disseminates available information on the wetlands of the Country, is run at SACON. This node has been releasing regular updates and newsletters on the wetlands of the Country, and has been effectively disseminating valuable information through publications and its website.

SACON has been assisting various agencies for developing ecological management plans for various types of ecosystems or protected areas, such as Oussudu lake Sanctuary (Puducherry), and Mahatma Gandhi Marine National Park (Andaman & Nicobar Islands).

SACON has been very active in spreading the message of conservation and nature education. In addition to organising various activities related to the DNA clubs (Department of Biotechnology, Government of India) in Andaman Islands, regular nature education activities are being conducted at SACON and outside, reaching out to thousands of students and general public.

During the year, 19 students were registered for PhD at SACON. Several youngsters are also supported by SACON in their Masters' programs and by capacity building through internships by working with SACON scientists.

Centre for Environmental Management of Degraded Ecosystems (CEMDE), University of Delhi, Delhi

Introduction

The 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 in some of the programmes during 2012-2013 are as follows:

Ecological Restoration

Ecological restoration of overburden dumps (OBDs) of coal mines of Bharat Coking Coal fields Limited (BCCL) and Central Coalfields (CCL) of Coal India Limited was initiated. OBDs spreading over an area of 20 hectares were selected. These OBDs are mostly composed of boulders and carbonaceous shales with no or skeletal soil. To enhance soil development and moisture retention, a grass cover of five selected grass species viz. *Cenchrus ciliaris*, *C. setigrus*, *Urochloa*, *Dichanthium* and *Bothriochloa* were developed. The grass species were selected based upon the site characteristics and species traits. The germination percentage of grass species varied from 70% to 90%. Saplings and rhizome slips of bamboo were also introduced on the site along with native species such as *Madhuca*, *Emblica*, *Diospyros*, *Terminalia* and *Schleichera*. Within three months about 50-75% of the area is covered with grasses and bamboos have attained the height of 2-3 meters.

Management of Invasive Species

Investigations on taxonomy of *Lantana* in India suggest that here are three aggressive invasive species of *Lantana* in the country. A

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new non-invasive species *Lantana* has also been circumscribed. For the first time, two novel invasive traits that make *Lantana* multiply and spread rapidly as also enable it to overcome herbivore pressure, have been observed and documented.

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 especially in the entire Jhirna valley of Corbett Tiger Reserve which spreads over 100s of hectares. Jhirna valley is an important tourist spot of Corbett Tiger Reserve and was covered with impenetrable thickets of *Lantana* before the *Lantana* control programme was initiated. Today, the Jhirna valley is free from *Lantana* and harbours luxuriant grasslands, receives 100s of herbivores. The tiger sighting in Jhirna landscape has also significantly increased. This has also been recorded by large number of tourists visiting the area.

Studies have also been initiated on *Chromolaena odorata*, another invasive species, which has invaded subtropical to temperate forests across India and form dense pure stands in degraded forests and open barren lands. The invasive traits of *Chromolaena* are similar to those of *Lantana*, and the cut root stock method can be used successfully to eradicate *Chromolaena*.

Grassland Management

As part of the long term study on grasslands in protected areas, grasslands in Corbett Tiger Reserve, Melghat Tiger Reserve and Kanha National Park have been extensively studied with respect to the management regimes adopted for grassland management in Protected Areas and the role of disturbance factors in determining grassland community structure.

Long-term Ecological research site

The ecologically restored mixed moist forest ecosystem developed on 250 acres limestone mined out areas at Purnapani, Odisha (Figure 4) and morrum mined out site at Asola Bhatti Wildlife Sanctuary have been selected as long term ecological research sites for monitoring changes in community composition and ecosystem function after ecological restoration.

Capacity Building

About 100 forest officials of Madhya Pradesh and Maharashtra have been trained in the 'Management of Invasive Weeds in Forest Ecosystems' at two workshops organized at Kanha National Park (Madhya Pradesh) and Melghat Tiger Reserve (Maharashtra). Additionally, 45 senior forest officials of the Odisha Forest Department have been trained on 'Management of *Lantana* in Forest Ecosystems' in a workshop held at Koraput in Odisha.

Madras School of Economics (MSE), Chennai

Introduction

The Centre of Excellence in Environmental Economics, Madras School of Economics (MSE), Chennai was set up under the 'Centres of Excellence' (CoE) Plan Scheme of the Ministry on the basis of a Memorandum of Understanding (MoU) entered into between the Ministry of Environment and Forests and Madras School of Economics in 2002. Its objective is to address issues of national importance with focus on economic aspects of the environment. The MOU was extended during the Eleventh Five Year Plan, which was also decided to be continued in the Twelfth Five Year Plan. This Centre of Excellence is under the administrative charge of the Economic Cell. The Senior Advisor in the

Ministry serves as a member on the Governing Board of MSE.

Under the Central Sector Scheme of Centres of Excellence, Plan funds are allocated to MSE annually as per its Action Plan drawn up on the recommendations of the Steering Committee constituted under the MOU. The Steering Committee is headed by the Senior Advisor of the Ministry and includes the Additional Secretary & Financial Adviser and Economic Adviser among its Members, apart from the Coordinator at MSE of the Centre and other Experts. The funds are released to the Centre in project specific mode to meet approved expenditures on the conducting of research studies, executing projects, holding Workshops, Seminars, etc. and for the maintenance of its website and so on.

Performance/ Achievements/ Progress made in 2012-13, including projected activities, with physical and financial targets and actual performance:

During 2012-13, the Centre has provided policy inputs to the Ministry on (i) *'India 2030 – Vision for an Environmentally Sustainable Future'*, a World Bank Report; (ii) *'National Manufacturing Policy'*; (iii) *'Road Map for Green National Accounting System'*; and (iv) *'Union Budget 2012-13'*.

Research Projects in 2012-13 (till 31.12.2012)

- It has prepared the draft report of the project *'Trade and Environment: India Export of Textile and Textile Products and Environmental Requirements'*. Based on experience gained through the study on leather exports, this study focuses on India's textile exports in the context of growing environmental regulations from several importing countries including European

Union and United States of America. The study attempts to address the structural adjustment problems facing the industry, global supply chains and environmental compliance requirements in order to create an enabling policy environment for the growth of the textile industry in India. It also addresses, *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 study was assigned to be carried out in two years starting from July 2008 at an estimated cost of ₹ 20.89 lakh. The Report, submitted in October 2012, is presently under consideration of the Ministry.

- The Centre has continued its work on the 18-month project *'Economy-wide Impacts of Pollution in India: Meta Analysis'* started in October 2010. The project aims to carry out meta-analysis of various environmental valuation studies relating to air and water pollution in India to assess macro-level estimates of overall impacts of pollution. A Review Workshop on the draft Report is scheduled with experts and stakeholders in the last quarter of 2012-13.
- Among the other on-going capacity-building projects, a training workshop was conducted by the World Bank on its recent report to the Ministry on *'Diagnostic Assessment of Select Environmental Challenges Facing India'*. The Centre would be holding a two-day *Conference on Environmental Economics* in collaboration with the Lancaster University Management School in the last quarter of 2012-13.

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Dissemination Papers

- The Centre has also drafted two Dissemination Papers, namely, 'Resource Economics' and 'Travel Cost Method for Environmental Valuation', which are presently under review.
- Two such papers presently being worked on by MSE are 'Environment and Development' and 'Trade and Environment-Inter-linkages'.

Newsletters: "Green Thoughts" (biannual publication)

- Volume 4(I), October 2012 has already been brought out by the Centre as per its approved Annual Action Plan for 2012-13.
- During 2011-12, the Centre had brought out two issues of the Newsletter, summarizing the work done at the Centre on various ongoing projects. While the focus of the issue of March 2011 was on 'Water Pollution and Wastewater Treatment' and the issue of November 2011 focused on the 'Green Economy'.

Visiting Researcher Fellowship Programme

- The objective of this programme, as outlined in the Vision Document, 2012-17 of MSE is to invite at least one researcher per year to spend a couple of months at the Centre. The programme was approved in the year 2008. The first Visiting Researcher Fellow is scheduled to visit the Centre in February 2013.

Training Programs

- The Vision Document, 2012-17 of MSE also envisages conducting of at least one training program per year on issues related to Environmental Economics, either through funding from the Ministry or other sources. For the current year 2012-13, a training workshop on "Environmental

Tax Reforms: International Experience and Relevance for India" is scheduled to be held in February 2013.

Environmental Economics Website

- The Centre's state-of-the-art website <http://coe.mse.as.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 7,500 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.
- In 2012-13, several, over 125, additions were made to the environmental economics database of MSE website by the end of December 2012.

New Directions and Other Issues

Among the works that have been tasked by the Steering Committee, at its meeting held in November 2012, to be carried out by the Centre starting in 2012-13 are the following:

- Preparation of a Dissemination Paper on 'Trade and Environment' by Dr. Badrinarayanan.
- Preparation of a Dissemination Paper on 'Environment and Development' by Dr. K.S. Kavi Kumar.
- Preparation of a comprehensive Policy Note with a view to addressing environmental issues through the awards of the

recently constituted Fourteenth Finance Commission.

The Steering Committee has also desired that the Centre should start working on “Sustainable Development Indicators” and first develop a detailed approach highlighting the choice of indicators and the data sources. This would be submitted to the Steering Committee for consideration in a subsequent meeting. The approach paper is intended to cover all the relevant literature and identify indicators that are in line with those suggested by Rio+20 Summit and UN Convention on Sustainable Development.

The Steering Committee has also agreed in-principle to the proposal on ‘Mineral Extraction and Valuation of Biodiversity Loss’, and suggested that it may be revised to reflect other potential approaches for assessing physical loss of biodiversity, clarity on indicator(s) that capture biodiversity in the study region, etc.

Budget allocation and progress of expenditure during 2012-13.

The total expenditure incurred by MSE for the period 1st April 2012 to 31st December 2012 is ₹23.55 lakh, of which the first installment of ₹15.50 lakh was released, and based on the utilization certificate and expenditure statement, the balance second installment has been also sanctioned.

Foundation for Revitalisation of Local Health Traditions (FRLHT), Bengaluru

Introduction

The Centre of Excellence on Medicinal Plants and Traditional Knowledge at Foundation for Revitalisation of Local Health Traditions (FRLHT), Bengaluru was initiated during 2002-03 to focus and address 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 rich collections of Medicinal plants. Besides, the Centre engages in:

- pharmacognostic studies on the controversial plant raw drug groups in trade;
- building capacities of different stakeholder groups about various issues related to medicinal plants, through its capacity building courses, workshops and training;
- preparing a GIS based Atlas of distribution maps of medicinal plants to help forest managers in planning conservation action; and
- well-referenced educational CD-ROMS on medicinal plants used in Siddha, Unani and Homoeopathic systems of medicine.



Fig-54. View of Herbarium compactor at FRLHT, Bengaluru

Having successfully completed the above focal activities during the 10th and 11th five year plans, the center expanded its focus for the 12th plan period so as to address the emerging needs of the sector. An Expert Committee, constituted by MoEF, reviewed the performance of the Centre for the 11th Plan period and recorded its appreciation of the excellent work done by the Centre. It also recommended additional research activities to be taken up by the Centre during the 12th plan period. Accordingly two more initiatives were added to the action plan for the year 2012-13 namely:

- Threat assessment of medicinal plants, and
- Ground truthing of status of medicinal plant populations.

These have been included as the sixth focal area. The six focal areas of the Centre, which are carried out in project mode, are discussed below:

Bio-Cultural Herbarium: Development of a unique Bio-cultural Herbarium of Indian Medicinal plants was one of the key activities. Towards this end, the botanical team of the Centre engaged in floristic surveys in different locations of Gujarat, Karnataka, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Arunachal Pradesh and Andaman-Nicobar Islands, which resulted in the collection of more than 1200 plant specimens corresponding to more than 150 medicinal plant species.

In order to make the Herbarium collection education friendly, they were grouped around specific themes. Further, more than 2000 images of plants including their medicinal parts and habitat, and scanned images of about 1800 Herbarium sheets were added to the image library in an attempt to make it into a Virtual one. During the year, more than 280

raw drugs 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 enriched by the addition of 52 species, while the garden's user-friendliness was further diversified by adding 2 more themes, viz., a) Resin and Gum yielding plants, b) Memory enhancer and anti-aging plants.

Pharmacognosy Studies: During the year, comparative phyto-chemical studies on collected accessions of Ativisha-Musta were completed. DNA marking studies for Ativisha-Musta was initiated. Bioactivity of all four Vidanga candidates was tested.

Distribution Mapping: During the year, Geo-distribution maps for 250 species and Eco-distribution maps for 25 species were prepared. Revised and upgraded version of Digital Atlas incorporating the Geo-distribution data of more than 2200 medicinal plant species and Eco-distribution data of more than 220 species of conservation concern was completed. Map depicting backward linkages with regions of occurrence for Cycas species developed.

Outreach Training & Educational material on Plants of Indian System of Medicines (ISM): During 1-5th October 2012, an international training workshop was conducted on "Conservation and Sustainable use of Medicinal Plants" for 25 trainees from 7 countries participating in CoP-11. Two capacity building courses on "Identification and Management of Medicinal Plant Resources" for the front line staff of Maharashtra were conducted. Additionally one refresher workshop for the senior forest officers from Maharashtra was also conducted. In order to develop a Training of Trainer (ToT) module on "Threat Assessment of medicinal

plants and CAMP methodology” a need assessment exercises was carried out to assess the working knowledge, skills and attitudes of partner agencies from Uttarakhand, Arunachal Pradesh and Chhattisgarh. A prototype of the CD-ROM on “Dhanvantri Nighantu” was developed.

Conservation and Sustainable management of medicinal plants: Necessary preparations were initiated for conducting a CAMP exercise in Nagaland. Preparatory activities began for taking up Ground truthing of select species of high conservation concern.

As the Technical Support Group (TSG) of Gol-GEF-UNDP project entitled “Mainstreaming Conservation and Sustainable Use of Medicinal Plants Diversity in Three Indian States”, the Centre contributed in the 11th meeting of Conference of the Parties to the Convention on Biological Diversity held in Hyderabad, during October 2012. In addition to the International training workshop organized at Bengaluru, an exhibition on multiple themes relating to medicinal plant conservation as well as several side events were organized at Hyderabad. The exhibition covered the themes: medicinal plants conservation, sustainable harvest, bioinformatics and database, trade in medicinal plants etc. and the side events were as follows:

- Biodiversity and Community Health.
- Arunachal-A Hidden Land: On biodiversity and its conservation as well as local healers of Arunachal Pradesh.
- Community palli: A discussion platform on use of certification schemes for processing of natural products and adoption of cultivation of medicinal plants as livelihood option.
- Jaddu Baddu: Highlighting the rich medicinal plant related cultural heritage of Chhattisgarh state.

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 and the institute 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. 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.

Centre for Animals and Environment, CARTMAN, Bengaluru

Introduction

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.

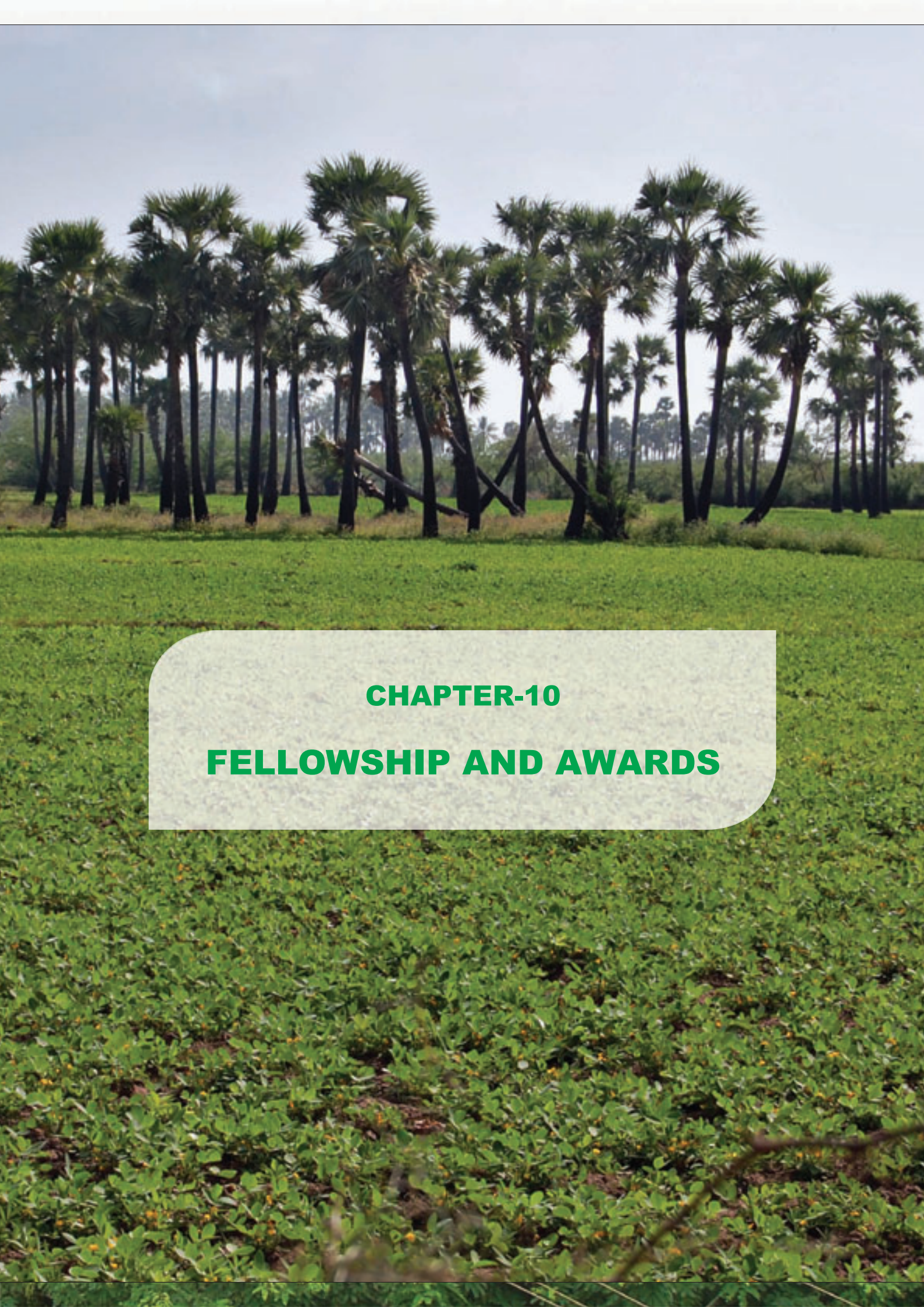
The main objective of the Project is to study the mutual dependence and inter-relationship between the Animals (LIVESTOCK) and Environment (Plant Life) and initiate steps to preserve environment and to improve the health and welfare of animals by making them more productive. Another activity envisaged is to eliminate pollution of environment caused by City based Abattoirs by providing alternate

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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

- **Tree Planting:** In connection with greening Bangalore, CARTMAN in association with Karnataka City Armed Police (CAP) arranged a tree planting programme on 9th June, 2012. Shri B.N.S. Reddy, IPS DIGP & Joint Police Commissioner of Police, CAR presided over the function and inaugurated the function by planting a sapling. Around 1000 saplings were planted.
- **Forests For Sustainable Livelihood:** CARTMAN arranged a Workshop on "Forests for sustainable livelihood" in their BBMP- ECO Park on 1st September 2012 where students of Jyothi Niwas College and Jain University participated. Students planted saplings in the park and also attended a lecture-cum-Audio show.
- **Additional Facilities Provided in the BBMP-CARTMAN Eco Park:** Bruhat Bangalore Mahanagar Palike (BBMP) provided additional facilities in the ECO Park such as paved walk path around the Gazebo, newly constructed angadwadi building with kitchen, amphitheatre for the open air theatre, etc.
- Three more kennels were constructed in the Veterinary Clinic for the use of injured animals.
- Work manual incorporating the fabrication drawings of the six models of improved CARTMAN Carts were sent to the Joint Director of State Government offices for undertaking fabrication of carts if they have plans to introduce CARTMAN carts in their jurisdiction.
- CARTMAN arranged a Bio- Diversity Exhibition on 5th November 2012 at the BBMP-CARTMAN Park. The exhibition was inaugurated by Dr. Vaman Acharya, Chairman, Karnataka State Pollution Control Board. The recently renovated park has a wide variety of Flora Bio Diversity.
- A Photo exhibition of various regions of the Planet with their specific flora and fauna ranging from Arctic region to Tropical Rain forest, Desert, Marine Life, etc. was also arranged. Students from various schools and local residents visited the exhibition.
- A audio visual show on flora and fauna was organised on 17th and 18th Dec. 2012. The show was visited by students from Karnataka.



CHAPTER-10

FELLOWSHIP AND AWARDS

Indira Gandhi Paryavaran Puraskar (IGPP)

Introduction

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 (IGPP)" to give recognition to those having made or have the potential to make measurable and major impact in the protection of environment. In the beginning, one cash prize of ₹1,00,000/- was awarded to either an individual or an organization of India in recognition of their exceptional and outstanding contributions in the field of environment. Presently, the award comprises of two prizes of ₹5,00,000/- each under "Organization Category" and three prizes of ₹5,00,000/-, ₹3,00,000/- and ₹2,00,000/- each under "Individual Category". Along with the cash prize, each awardee is given a Silver Lotus Trophy, Scroll and Citation. The award is given annually and an advertisement inviting nominations for IGPP is released every year on 15th of July in national dailies with regional coverage.

As per the 'Regulations governing IGPP', revised in 2010, 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. There is no age limit for nomination of individual. However, self nominations and nominations proposed by relatives are not considered.

Shortlisting of nominations received for IGPP is carried out by three Expert Members, selected by the Prime Minister's Office (PMO), out of a panel of 9 eminent environmentalists/persons prepared by the Ministry of Environment and Forests. Selection of awardees out of the shortlisted nominations is done by the Environmental Prize Committee constituted under the Chairmanship of Hon'ble Vice President of India. 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 selected by the Prime Minister's Office
- Secretary, Ministry of Environment and Forests (Member Secretary)

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

A meeting of the Prize Committee was held under the Chairmanship of Hon'ble Vice

President of India on 2nd May, 2012 and the awardees of IGPP in the Individual Category for 2009 were selected. The awardees in the Organization Category for 2009 had earlier been selected in the meeting of the Prize Committee held on 29th June, 2011. Two Awards of ₹ 5 lakh each for organisation category were awarded to Care Erth, Chennai, Tamil Nadu and Neyveli Lignite Corporation, Neyveli, Tamil Nadu. Two Awards for ₹ 5 lakhs and Rupees ₹ 3 lakhs for individual category were awarded to Prof. C.R. Babu, New Delhi and Shri Vijay Jardhari, Jardhagaon, Uttarakhand respectively.

The awards were conferred in a formal ceremony held on 5th June, 2012 on the occasion of World Environment Day.

Shortlisting of nominations received for IGPP-2010 were completed by the three Experts selected by PMO. The ground truth verification of these nominations has also been completed. The shortlisted nominations along with the verification reports will be placed before the Prize Committee shortly for selection of awardees of IGPP for 2010.

As desired by the Prize Committee, another revision of 'Regulations governing IGPP' was done during 2012-13. The revisions include:

- The total period for inviting nominations was reduced to 45 days from the date of publication of the advertisement. Henceforth, the last date for receipt of nominations shall be 29th August every year.
- Selection of Expert Members of the Prize Committee shall be done biennially by the Ministry. The tenure of the Expert Members will be 2 years. All the Prizes that will be proposed during the tenure of the Expert Members will be considered by them irrespective of the year.



Fig-55. The Chief Minister of Delhi, Smt. Sheila Dikshit and Smt. Jayanthi Natarajan, Minister of State (I/C) for Environment and Forests, presented the Indira Gandhi Paryavaran Puraskar on the occasion of World Environment Day in New Delhi

- The number of shortlisted nominations is to be not more than 10% of the total number of nominations received.
- Shortlisting is to be completed by the Expert Members within 30 days of despatch of brief of nominations to them.
- Ground-truth verification of the short listed nominations will be done by the Regional Offices concerned of the Ministry within 45 days of despatch of shortlisted nominations to them.
- While submitting the briefs of nominations to the Expert Members for short listing the most deserving nominations, the Ministry will give information regarding the previous awardees and categorized (State-wise, zone-wise, gender-wise etc.) data on awards received, so that the non-represented States/ zones/ areas get proper representation. The experts will be requested to give proper emphasis on these aspects, besides other criteria of selection, while short listing the nominations.
- Prize will be given at a formal ceremony to be arranged by the Ministry of Environment and Forests on any occasion related to

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environment each year, preferably on 5th June.

The nominations received for IGPP-2011 have been processed and briefs prepared. Advertisements for inviting the nominations for IGPP-2012 were issued on 15th July, 2012. The nominations for IGPP-2012 under both the individual and organization category have been received. Selection of experts for IGPP-2011 and 2012 is in process.

Indira Priyadarshini Vriksha Mitra (IPVM) Awards

Introduction

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 (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 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, Odisha and West Bengal) **West** (Goa Gujarat, Maharashtra, Rajasthan, UT of Dadara & Nagar Haveli, UT of Daman & Diu and UT of Lakshdweep) **South** (Andhra Pradesh, Karanataka, Kerala, Tamilnadu, UT of Andaman & Nicobar Islands, UT of Puducherry) **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 ₹ 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.

Present Status

The IPVM Awards for the year 2010 were conferred on 19th November, 2010. Sh. A.T. Mishra, DFO Dhalbhum Forest Division, Jamshedpur (Jharkhand) was given award under category "Individual including Government Servant". Forestry extension wing Tamilnadu 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 as well as 2012 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-67).

The IPVM Awards for States/UTs for 2008 were conferred upon on 19th November, 2010.

Pitamber Pant National Environment Fellowship Award

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 nominations 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 nominations have been obtained and are under process.

Table-67. 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	₹8.00 lakhs (one)	J&K
b)	Small State having geographical area below 80,000 Sq.Km.	₹5.00 lakhs (one)	Mizoram
c)	Union Territories	₹ 5.00 lakhs (one)	UT of Chandigarh

National Environmental Sciences Fellows Programme

The National Environmental Sciences Fellows Programme launched in 2009-10, aims to be a flagship programme for young scientists who are desirous of working in the forefront of environmental sciences research. The Management Committee of the Programme has been reconstituted under the chairmanship of Dr. K. Kasturirangan, Member (Science), Planning Commission. Three scientists have been selected as National Environmental Sciences Fellows. These fellows are working in the areas of Climate Change Mitigation-Adaptation and Ecosystem Services in the context of Green India Mission and REDD+, quantitative framework for conservation landscape planning of dry grasslands and community wide seed dispersal patterns in Human-modified Landscapes and prediction of forest cover changes.

Mahatma Gandhi Chair for Ecology and Environment

The Mahatma Gandhi Chair for Ecology and Environment has been set up at the Centre for Biodiversity Studies, Baba Ghulam Shah Badshah University, Rajouri, Jammu and Kashmir. An eminent scholar in the area of biodiversity has been selected and has joined as Mahatma Gandhi Chair at Center for Biodiversity Studies, Baba Ghulam Shah Badshah University. The Fellow has initiated studies on plant diversity of Rajouri, Poonch and adjoining areas of Pir Panjal Himalayas.

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 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 5th June, coinciding with the World Environment Day. Each award will carry ₹ 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. The award for 2009 was given to Dr. D.K. Singh (Plant Taxonomy) and Dr. Wasim Ahmad (Animal Taxonomy).

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 ₹ Two lakh in addition to a silver Trophy and a Citation.

The National Award for Prevention of Pollution for the year 2010-2011 was awarded 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 year 2011-2012. Twenty five nominations have been received and evaluation of the same are being undertaken 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

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make, a major impact on the protection and conservation of wildlife in the country. Two awards of ₹ 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. Nominations are invited for the Rajiv Gandhi Wildlife Conservation Award for the years 2011 and 2012.


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 ₹ 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. Nominations are invited for the

Amrita Devi Bishnoi Wildlife Protection Award for the years 2011 and 2012.

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 ₹ 4,000 per month. In addition, an amount of ₹ 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). Invitations were invited for Shri Kailash Sankhla National Wildlife Fellowship Award for the year 2012. So far, total 3 nominations have been received and the same would be appraised by the Awardees Selection Committee under the Chairmanship of the Secretary (E&F).



CHAPTER-11
ENVIRONMENTAL
INFORMATION

Environmental information (EI) Division

Introduction

EI Division is responsible for the following areas of work:

- Formulation, implementation and monitoring of the Environmental Information System (ENVIS) Scheme with a view to making it a single-stop web-enabled comprehensive information system, including the following:
 - Formulation and issuance of guidelines for administration of the Scheme.
 - Periodic convening of the Scientific Advisory Committee (SAC) to review the functioning of the Scheme.
 - Review and approval of Annual Plan of Activities of each of 67 ENVIS Centres country-wide set up for providing scientific, technical and semi-technical information on various environmental issues.
 - Monitoring and oversight of the functioning of ENVIS Centres.
 - Coordination of all activities of the ENVIS Centres through the ENVIS Focal Point located in EI Division.
 - Auditing and upgrading of ENVIS Centres' Websites maintained on National Informatics Centre (NIC) Portal.
 - Development and maintenance of an ENVIS Portal connecting all ENVIS Centres.
 - Development and maintenance of the Ministry's Website which has also been linked with various Divisions.
 - Supporting and promoting research, development and innovation in environmental information technology.
- Supporting capacity building in development of repositories and dissemination of environmental information, including through holding of National/ Regional Workshops.
- Coordination of independent evaluation overall of the Scheme as well as conducting annual performance review of each ENVIS Centre, including through National Evaluation Committees of Experts on both subject-specific matters and Status of Environment and Related Issues.
- Development and maintenance of India State-Level Basic Environmental Information Database (ISBEID) to help 28 ENVIS Centres at State Governments/ UTs to collect, compile and disseminate State/ UT-wide information on a centralised server.
- All matters related to Green National Accounting in India.
- Disposal of Parliament matters regarding the ENVIS scheme.
- Disposal of Right to Information Act, 2005 matters regarding the ENVIS Scheme.
- Coordinating all matters regarding the conferring of the 'Indira Gandhi Paryavaran Puraskar' (IGPP), including development of 'Regulations governing IGPP'.
- Coordinating and representation of the Ministry on UNEP's Global Environment Outlook (Geo-5)'s High Level Inter-Governmental Advisory Panel and Summary for Policy-Makers' (SPM) Drafting Group under its global inter-Governmental and multi-stakeholder consultations.
- Coordinating the development, publishing

- and dissemination of the Annual Reports of the Ministry.
- Coordinating the development, publishing and dissemination of the annual National 'Report to the People on Environment and Forests' since 2009-10.
 - Coordinating the development, publishing and dissemination of periodic State-of-Environment (SoE) Reports of Nation/ States/ UTs/ Cities/ Towns/ various environmental 'Hot-Spots'.
 - Coordination and liaison with various National information systems.
 - All financial matters relating to the Schemes and Programmes handled by the Division.
 - Collection and dissemination of information to various Non-Governmental Organisations (NGOs) through the NGO Cell, and 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.

Environmental Information System (ENVIS)

Introduction

Environmental Information System (ENVIS), by providing scientific, technical and semi-technical information on various environmental issues since its inception in 1982-83 (Sixth Plan), has served the interests of policy formulation and environment management at all levels of Government as well as decision-making aimed at environmental protection and its improvement for sustaining good quality of life of all living beings. The purpose has been to ensure integration of national efforts in web-enabled environmental information collection,

collation, storage, retrieval and dissemination to all concerned, including policy planners, decision-makers, researchers, scientists and the public.

The long-term objectives of the Scheme are as follows:

- 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.

Its short-term objectives are as follows:

- 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.

Functionally, it is a decentralised system of ENVIS Centres mandated to develop

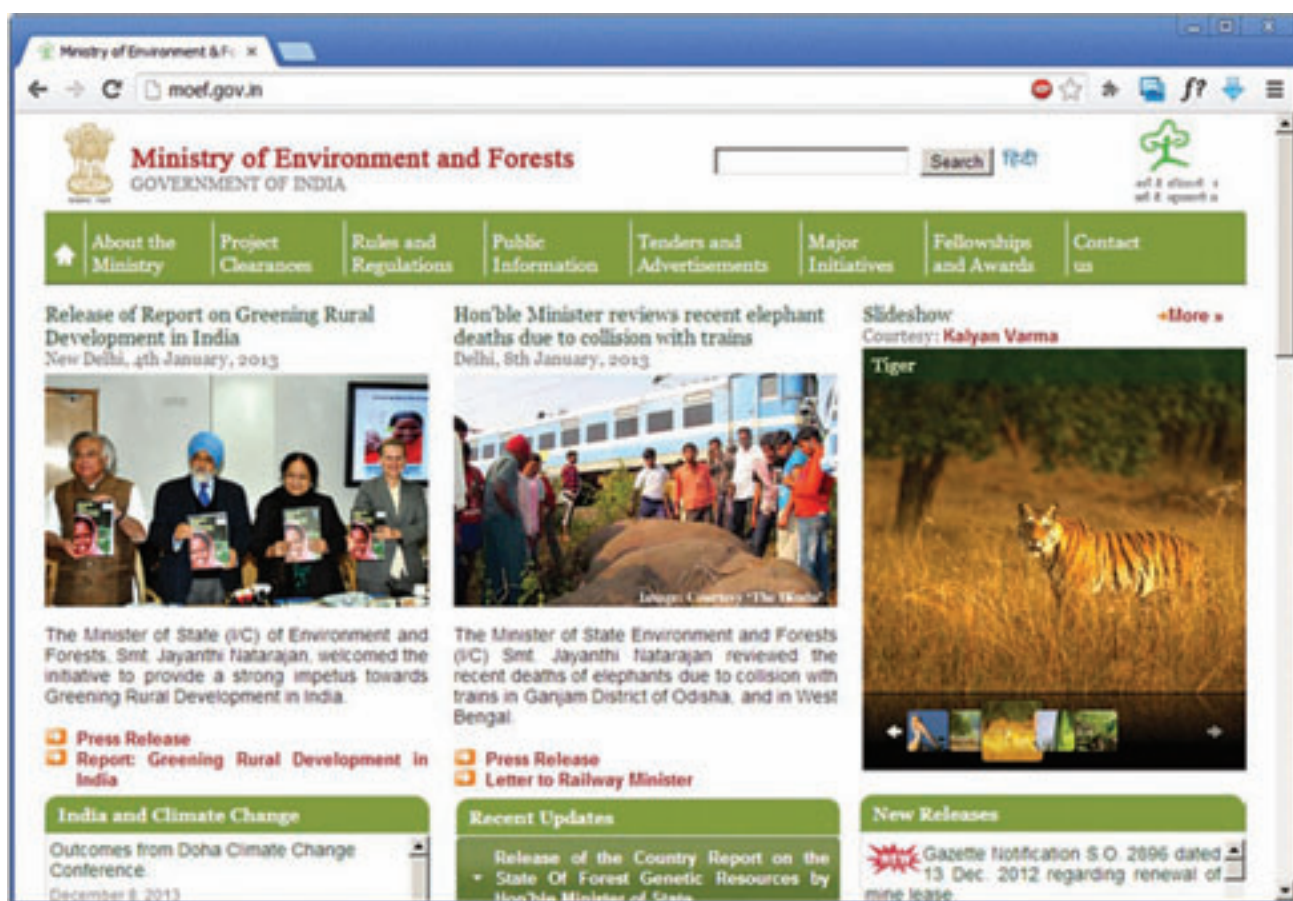


Fig-56. Ministry's Website (<http://www.moef.gov.in>)

a distributed network of subject-specific databases. With the association of the various State Governments/Union Territories Administrations in promoting the ENVIS network to cover a wide range of subjects, 28 ENVIS Centres are operating from State/ UT Departments/ Pollution Control Boards on State/ UT-wide status of environment and related issues.

ENVIS network at present consists of a chain of 67 ENVIS Centres out of which 39 are on subject-specific and 28 on State/ UT related issues. These Centers are hosted by notable organizations/institutions/State/ UT Government Departments/ Universities throughout the country. The Focal Point of ENVIS is located in the Ministry and assists the EI Division in coordinating the activities of all

the ENVIS network partners. The list of ENVIS network partners is given at **Annexure-IX**.

Progress/ Achievements made in 2012-13

In 2012-13, the ENVIS network, established under ENVIS Scheme comprising of 67 ENVIS Centres variously covering subject-specific areas and status of environment and related issues, continued its mandated annual information-related activities, database development, publication of requisite information packages through newsletters, abstracting services, etc. It also continued its query-response services during the year. This has entailed, *inter alia*, updating and maintaining an information database that includes both descriptive information as well as numerical data. Descriptive information in the form of publications, reports, reprints and

abstracts on related subjects was stored for dissemination. Numerical data on the subject concerned was collected, compiled, processed and analyzed for the purpose of dissemination through the Centres. Documentation in the form of publications and reports were brought out. All the information thus compiled was made available on the websites of the respective ENVIS Centres.

ENVIS Focal Point maintained and continuously updated the Website of the Ministry (URL: <http://www.moef.gov.in>) and disseminated information through the Website to all concerned throughout 2012-13. The Website (Fig-56) was also linked with the various Divisions of the Ministry in order to have up-to-date information on the subjects concerned. Besides, information on new updates of the Ministry, responses to

media reports and other important issues of the Ministry was regularly uploaded on the Website with the objective of disseminating such information to all concerned. The Website itself, which recorded a huge number of hits per month reflecting its high usage by national and international users, was upgraded in 2012-13 and transferred to an open-source Content Management System (CMS), keeping in view the guidelines for development and management of government websites to render it more transparent, user friendly, database-driven and dynamic with modern features such as browser independence and compatibility with mobile devices.

A Portal of ENVIS connecting all the ENVIS network partners (URL <http://www.envis.nic.in>) is updated regularly (Fig-57). The Portal acts as a catalyst for inter-Centre interaction and

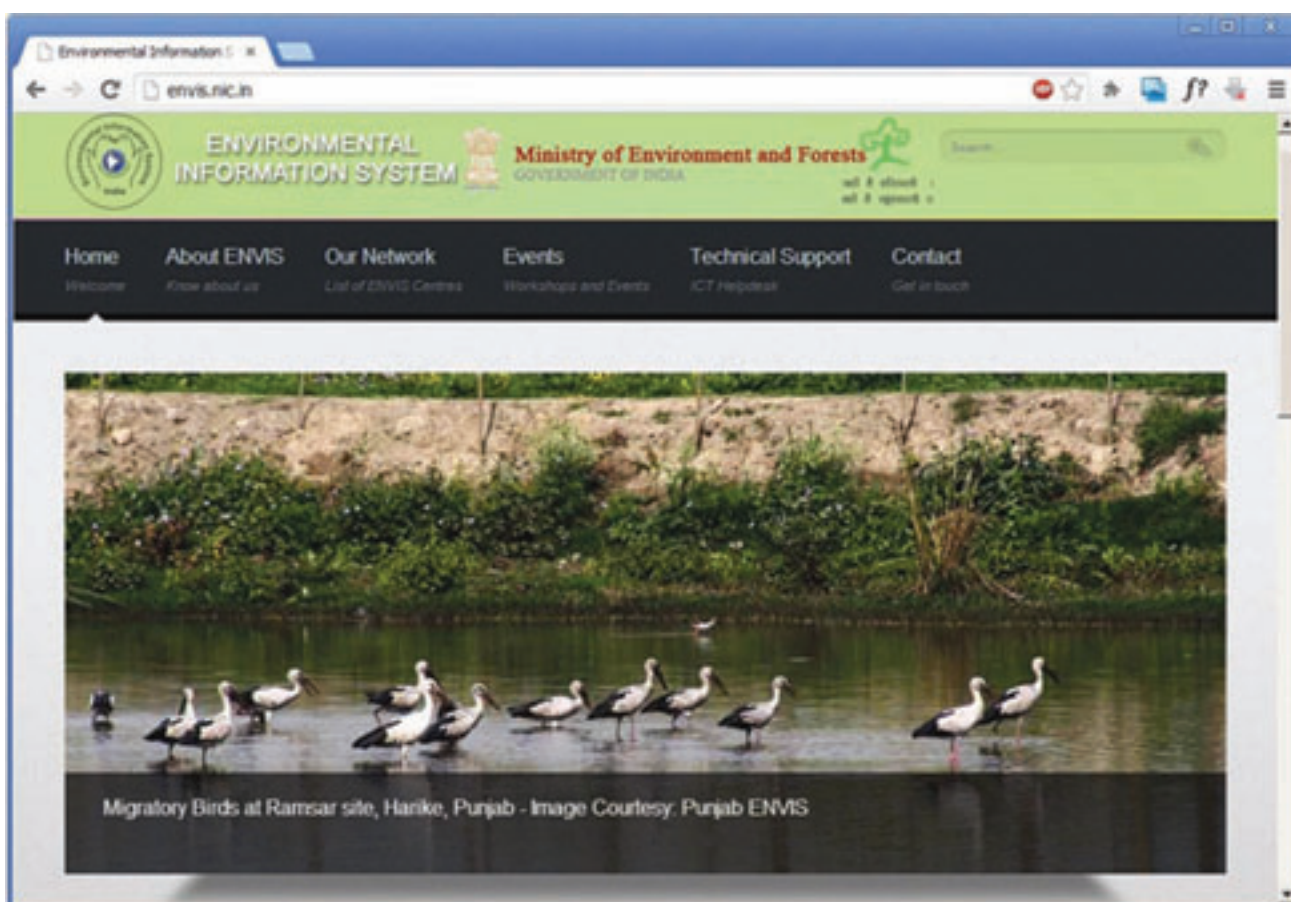


Fig-57. ENVIS Focal Point Website (<http://www.envis.nic.in>)

for information on several broad categories of thematic and State-specific subjects assigned to the Centers. The Websites of all ENVIS Centres are also directly accessible from the homepage of the Portal enabling sourcing of information on major events, activities and current updates of the entire network.

In 2012-13, the ENVIS Portal was redesigned to make it more user-friendly. Online monitoring and evaluation on a regular basis via the ENVIS Portal for ENVIS Centres is under implementation.

In 2012-13, security auditing of 36 ENVIS Centres' websites, taken up *en bloc* in Phase-I, has been completed. These Websites have been transferred to a common CMS platform in collaboration with NIC for conformance with the Guidelines issued by Indian Computer Emergency Response Team (CERT-In). The Websites are to be bilingual i.e., English and Hindi or a regional language, have features like archival process, dedicated sections for events/announcements, SoE Reports and Photo Gallery, etc, besides having secure control panel for each ENVIS Centre to submit their monthly reports, publications, etc. Process of inclusion of remaining Centres' Websites in Phase-II is underway.

The fourth National Evaluation Workshop was organised on 29-30th August, 2012 at Bhopal. The Centres were evaluated by two Independent Expert Committees constituted by the Ministry, one for Centres hosted by State Governments/UT Administrations and the other for Thematic Centres. The participating ENVIS Centres actively interacted with the experts and peer Centers on various technical issues pertaining to their day-to-day functioning. The Committees made certain recommendations for the improvement of the functioning of the ENVIS Centres and ENVIS Scheme as a whole.

The meeting of the 10-member re-constituted Scientific Advisory Committee (SAC), under the Chairmanship of the Secretary, Ministry of Environment & Forests, was held on 5th November 2012. SAC, which consists of five official and five non-official Members, is mandated to review the functioning of ENVIS Scheme, to suggest new areas in upcoming fields of environmental sciences, and identify appropriate institutions for setting up Centres. The recommendations of the fourth National Evaluation Workshop, held on 29-30th August 2012 at Bhopal were ratified by the SAC, and taken into account while taking its own decisions on the desirable improvements of the ENVIS Scheme as a whole while carrying out a review thereof. In accordance with the decisions of SAC, the Note for the Standing Finance Committee (SFC) has been revised, and considered by the IFD. The process for final approval of the competent authority on the modifications to the Scheme and, in particular, the revised guidelines for the operations of the Centres and revised parameters for evaluating the functioning and performance of ENVIS Centres is well under way and would be concluded within the financial year.

Query-Answer service is one of the major responsibilities of the 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 Eleventh Plan period on various subject areas on environment and its allied disciplines. In 2012-13 (as on 31.01.2013), 29,865 queries were addressed by 51 Centres and the ENVIS Focal Point. Further, wherever, information is not readily available, the network also provided 'Referral Service' to the concerned users. The major subject areas on which the queries were responded pertained

to climate change, ozone layer, environmental conservation, environmental standards, water and air pollution, waste management and environmental laws, environmental education and awareness, etc.

Online Monitoring and Evaluation System on day-to-day basis for ENVIS Centres, has been taken up for development. A prototype is presently being used to evaluate the 36 Centres whose Websites have been upgraded so far.

Based on the independent performance evaluation of each Centre by the respective National Evaluation Committee, the recommendations of the physical visit by an officer of the Ministry, and online evaluation of the ENVIS Centre, the Division extended financial support to 46 Centres (by 31.01.2013) as compared to 47 in the year 2011-12. Three proposals from reputed institutes/organisations for hosting new ENVIS Centres were also considered as per the guidelines in this regard.

Activities with regard to SoE Reports were also taken up and Reports for Karnataka and Lakshadweep are likely to be published in 2012-13. Reports for Arunachal Pradesh, Jammu & Kashmir and Tripura are under preparation.

Activities of some ENVIS Centres during the year 2012-13 (as on 31.01.2013)

- **ENVIS Centre at the Bombay Natural History Society (BNHS), Mumbai:** It is a thematic Centre on 'Avian Ecology and Inland Wetlands'. In 2012-13, apart from participating in the Eleventh Conference of Parties of the Convention of Biological Diversity (CoP-11) hosted by India (Hyderabad; 8-19th October 2012), the Centre published and distributed a special issue of BUCEROS Newsletter on the achievement of Aichi Biodiversity
- **ENVIS Centre at CPR Environment Education Centre, (CPREEC), Chennai:** The thrust area of CPREEC ENVIS on 'Conservation of Ecological Heritage and Sacred Sites in India' had 8 specific components (sacred plants, gardens, groves, animals, mountains, rivers, water bodies and precincts of India) and expanded the scope of its activities to include a component on 'sacred seeds' in April 2012. The web page format of sacred animal was changed and information added for around 13 sacred animals and 35 sacred groves. Trees of the Rig Veda were compiled under sacred plants. Its website (<http://cpreecenvis.nic.in>) recorded about 1,32,000 hits this year so far and in addition to numerous personal interactions, around 12 queries were answered by email and telephone. Ecoheritage.com (Volume XI: April 2012 to March 2013) was compiled as a single issue. CPREEC continued to collect and update its databases on ecological traditions of various States of India.
- **ENVIS Centre at Department of Environment, State Government of Tamil Nadu (TNENVIS), Chennai:** With a thrust area on 'State of Environment and related issues' in Tamil Nadu, the ENVIS Centre prepared a database on fungal diversity of Tamil Nadu and State of Environment Report for Chennai Metropolitan Area during 2012-13. Three subject-specific newsletters were also published on Green Economy, Greening in Tamil Nadu and Wildlife of Tamil Nadu. The ISBEID database was updated under all modules. The Centre

Target-19. The Centre responded to about 150 queries on Avian Ecology, and its website (<http://bnhs.nic.in>) which underwent restructuring in 2012, hosts useful information on avian ecology.

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conducted various awareness programmes and exhibitions during World Environment Day 2012, Wildlife Week 2012 and Chennai Science Festival 2012. The Centre's website (<http://tnenvis.nic.in>) has been revamped and data updates are made regularly in the public domain.

- **ENVIS Centre at National Botanical Research Institute (NBRI), Lucknow:** NBRI ENVIS, a thematic Centre on 'Indicators of Plant Pollution' published newsletters on *Plant Adaptation to Drought and Climate Change and Agriculture* for circulation among various stakeholders in India. Monthly E-news bulletins and news bulletins were prepared on various themes (pesticide waste, vehicular pollution, e-waste, hazardous waste, etc.) and uploaded on its website. Various modules of its website (<http://nbrienvis.nic.in>) including Hindi webpages were updated. Under the subject area module, Green Planner has been updated and a new link 'NBRI-PADAP' has been added. Articles of the month on different topics, viz., indoor air pollution, nano-intruders, artificial photosynthesis, etc. were prepared and uploaded on the website.
- **ENVIS Centre at National Institute of Occupational Health, (NIOH), Ahmedabad:** This thematic Centre on 'Environmental and Occupational Health' brought out newsletters, bibliographies and upcoming event in its subject fields. The website (<http://www.niohenvis.nic.in>) has been redesigned and updated with newsletters and bibliographies, statistical data including industry-wise fatal and non-fatal injuries and dangerous occurrences during 2009 in Gujarat state, fatal and non-fatal injuries

in factories (P) (India), major industrial accidents in Asia, etc.

- **ENVIS Centre at World Wide Fund for Nature - India, (WWF-India), New Delhi:** On its theme 'NGOs and Parliament Matters related to Environment', the Centre's major activities included compilation of the periodical publications and publishing of 10th Edition of the NGO Directory. The Centre has also compiled the compendium on 'Environment in the Indian Parliament: An Analysis 2011' (Lok Sabha and Rajya Sabha) which included statistical and graphical presentations of trends on the subject in Parliament. The Centre also compiled quarterly newsletter on its activities and updated information on subject areas, which accessed online (<http://wwfenvis.nic.in>).
- **ENVIS Centre at Environment Management & Policy Institute (EMPRI), Bengaluru:** The State Centre on the thrust area of 'Status of Environment and related issues' redesigned the ENVIS website (<http://karenavis.nic.in>) adding new sections for information related to news items, newsletters, publications and taxonomic databases. Its databases section provides access to various species databases (birds, butterflies, medicinal plants, fishes, African Giant Snail, etc.). The Centre has also developed a geospatial portal to disseminate information on various attributes including biodiversity, physico-chemical/ morphological aspects and other attributes regarding the health of water bodies around Bengaluru. The Centre published 4 issues of "Parisara" Newsletter on themes like 'E-Waste Management', 'Climate Change', 'Rainwater Harvesting' and 'Management of Invasives like Lantana Camara'. A library of over 4,000 titles was

established and also digitised with KOHA Open Source software. On ISBEID, data was collected and updated in 12 out of 17 modules for an average of 5 years.

- **ENVIS Centre at Environment Protection Training and Research Institute (EPTRI), Hyderabad:** The Centre on the thematic area of 'Ecology of Eastern Ghats' has restructured and upgraded its website (<http://eptrienvis.nic.in>). Data on mineral wealth and mining activities, biodiversity, protected areas, Seshachalam biosphere reserve, experts and abstract database, news clippings, photo gallery, emerging issues, conventions treaties, legislation, policy matters and library were updated on the website. EPTRI ENVIS published four quarterly newsletters (ISSN: 0974-2336) on the themes of 'Medicinally Important Climbing Plants from Eastern Ghats', 'Mineral Wealth of Eastern Ghats Region', and 'Faunal Rediscovery and New Records in Seshachalam Biosphere Reserve'.
- **ENVIS Centre at Forest Research Institute (FRI), Dehradun:** Drawing from its thematic area of 'Forestry', the ENVIS Centre published an issue of ENVIS Forestry Bulletin on 'Poplars in India' which was released during the 24th Session of the International Poplar Commission held at FRI (29th October – 2nd November, 2012) and five issues of Environment and Forests News Digest. Its website (<http://frienvis.nic.in>) was restructured and redesigned. The Centre compiled bibliographical databases on 'Indian Forestry Abstracts', 'Participatory Forestry Management', 'Prosopis juliflora, Poplars' and 'Environment and Forests' which are accessible online. These databases have been updated with the addition of new references. Besides,

the website also offers detailed information on different forest species, forest cover, etc. in the country.

- **ENVIS Centre at Institute for Ocean Management (IOM), Chennai:** IOM ENVIS specialises in the theme of 'Coastal Zone Management and Coastal Shelter Belts'. During 2012-13, it developed State-wise coastal erosion maps indicating high, medium and low erosion categories, which were cleared by Coastal States/ UTs of Gujarat, Kerala, Odisha, Puducherry and Tamil Nadu, updated the database on mapping and information on all hotspots of Coastal Shelter Belts and ecologically sensitive areas in India; updated statistics on fishery resources for all Coastal States/ UTs; and created a database on Coastal Shelter Belts. The Centre also provided detailed description of the Andaman & Nicobar and Lakshadweep Islands and created a GIS database of island and land use of selected inhabited islands. The databases and related information is available on Centre's website (<http://www.iomenvis.nic.in>).
- **ENVIS Centre at Indian School of Mines (ISM) Dhanbad:** This ENVIS Centre deals with environmental issues pertaining to mining. During FY 2012-13, the website (<http://ismenvis.nic.in>) was switched to new design. The Centre has collected, compiled and disseminated relevant documents/information in the field of mine environment worldwide through newsletters and website. The Centre was visited by a number of luminaries. Query response services to national and international institutions and individuals were also provided during the year. Three newsletters have been published by the Centre and the website is continuously

updated with news, major activities and upcoming events.

- **ENVIS Centre at Environment & Ecology Wing, Forests & Environment Department, State Government of Manipur, Imphal:** The thrust of information maintained and updated by this Centre is on 'Status of Environment and Related Issues'. Among State ENVIS Centres, this Centre has systematised its information collection and updating on each of the parameters included in the 17 modules of ISBEID by identifying gaps in data availability and was accordingly among the first to begin making data entries in the specific modules on environment and ecology (<http://manenvis.nic.in>), besides carrying out its major activities of publishing of newsletters, reports, etc.

India 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 application, namely, India State-Level Basic Environmental Information Database (ISBEID) was developed by the Division in collaboration with NIC. ISBEID is especially intended to help the ENVIS Centres hosted by State Government/ UT Administrations to collect, compile and disseminate information on a centralised server and to fill their gaps in environmental data dissemination. Initially, a pilot project was taken up for two States, namely, Odisha and Madhya Pradesh with 6 modules of the proposed 23 modules. Later, it was extended to 7 more States with 6 additional modules. Based on its results, it was decided to review the 23 modules in consultation with extant 28 States'/ UTs' ENVIS Centres and to extend ISBEID to all States/UTs.

Following a Workshop held for this purpose (Hyderabad; 7-8 June, 2010), the number of modules were reduced to 17 (covering air and water pollution, forestry, land resources, flora, fauna, etc.). ISBEID is now being extended to all States/UTs ENVIS Centres.

There are two components of ISBEID application, namely, Management Information System (MIS) and Geographic Information System (GIS) that have been developed by NIC in collaboration with ENVIS Focal Point. The MIS component is primarily intended to provide (a) provide one-stop information source to users, (b) query data from its repositories with advance search and filters, (c) prepare charts and graphs to visualise data, and (d) provide statistical tables in PDF and XLS formats to the users for their custom use. The GIS modules is intended to (a) provide internet-based GIS application, interactive maps capable of handling operations like zoom in/out, pan, print, measure etc., and (b) enable querying ISBEID interactively on dynamic maps with layers such as rivers, railways lines, roads, location of National Parks, Reserves etc. A two-day user workshop was organised (New Delhi, 12-13 May, 2011) with all State/UT ENVIS Centers, experts and officials from the Ministry, in order to familiarise them with the use of MIS and GIS modules of ISBEID software. Another User Workshop on ISBEID and ENVIS Network websites was organised on 18-19th February 2013 at New Delhi. The Workshop deliberated on inter-linking and unifying various environmental databases of the ENVIS network. A new user-interface for the ISBEID application has also been taken up keeping in view modern technologies, which will enable dynamic access to maps on the homepage and interactive querying and generation of customised summary reports using its databases.

Indira Gandhi Paryavaran Puraskar (IGPP)

In 1987, the Ministry instituted an award called "Indira Gandhi Paryavaran Puraskar" to give recognition to those having made or having the potential to make measurable and major impact in the protection of environment. Initially, one cash prize of ₹ 1,00,000/- was awarded to either an individual or an organization of India in recognition of their exceptional and outstanding contributions in the field of environment. Presently, the award comprises of two prizes of ₹ 5 lakh each under the "Organization Category" and three prizes of ₹ 5 lakh, ₹ 3 lakh and ₹ 2 lakh respectively under the "Individual Category". Along with the cash prize, each awardee is given a Silver Lotus Trophy, Scroll and Citation. The award is given annually and an advertisement inviting nominations for IGPP is released every year on 15th July in national dailies with regional coverage.

As per the decision of the Prize Committee, another revision of 'Regulations governing IGPP' was done during 2012-13. The revisions broadly include the following:

- The total period for inviting nominations was reduced to 45 days from the date of publication of the advertisement. Henceforth, the last date for receipt of nominations shall be 29th August every year.
- Selection of Expert Members of the Prize Committee shall be done biennially by the Ministry. The tenure of the Expert Members will be 2 years. All the Prizes that will be proposed during the tenure of the Expert Members will be considered by them irrespective of the year.
- The number of shortlisted nominations is to be not more than 10% of the total number of nominations received.

- Shortlisting is to be completed by the Expert Members within 30 days of despatch of brief of nominations to them.
- Ground-truth verification of the short listed nominations will be done by the Regional Offices concerned of the Ministry within 45 days of despatch of shortlisted nominations to them.
- While submitting the briefs of nominations to the Expert Members for short listing the most deserving nominations, the Ministry will give information regarding the previous awardees and categorised (State-wise, zone-wise, gender-wise etc.) data on awards received, so that the non-represented States/ zones/ areas get proper representation. The Experts will be requested to give proper emphasis on these aspects, besides other criteria of selection, while short listing the nominations.
- Prize will be given at a formal ceremony to be arranged by the Ministry of Environment & Forests on any occasion related to environment each year, preferably on 5th June.

Annual Report of the Ministry

The Annual Report of the Ministry for the year 2011-12 was published and got 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 made available on the website of the Ministry.

The details of the IGPP and the present status are given in Chapter-10 dealing with Fellowships and Awards.

Report to the People on Environment and Forests

As a follow-up to the Hon'ble President of India's address to the Joint Session of the Parliament on June 4, 2009, EI Division of the Ministry published its First Report to the people on Environment and Forests-2009-10. In 2012-13, the Second Report for 2010-11 has also been published. The purpose of the Reports 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 Reports have been hosted in the Ministry's website and widely distributed to all the stakeholders concerned.

State of Environment Reporting (SoER) Scheme

Since the Tenth Plan, 100% Central Assistance is provided to States/UTs to prepare their SoE Report highlighting the upstream and downstream linkages with environmental issues, besides creating a baseline document in each State/UT. SoER reporting was merged with the ENVIS Scheme in 2008-09. Since 2004-05, one National SoE Report and 29 States/ City/ Hot Spots Reports have been published. During 2012-13, SoE Report of Chennai Metropolitan Area has been printed and draft SoE Reports for Karnataka and Lakshadweep have been prepared.

Statistical Cell

The functional responsibilities of the Statistical Cell are as follows:

- Identification of existing data gaps and advice on bridging them in order to strengthen the process of planning, monitoring and decision-making in the Ministry.

- Development and management of an efficient centralised statistical database on environment and forestry sectors with the assistance of various Divisions of the Ministry and Environment Centres, with a view to meeting the requirements of various Divisions and other overall requirements.
- Liaison with Ministry of Statistics & Programme Implementation and other Ministries on all types of statistical matters
- Liaison with State Governments and UT Administrations, and where necessary, subordinate and attached offices and autonomous bodies of Ministry of Environment & Forests to strengthen the processes of data collection, validation, processing and interpretation of statistical data.
- Rendering advice to all Divisions on statistical matters and providing interpretations of statistical data and implementation of statistical components of various Conventions and Agreements.
- Undertaking research studies based on the centralised database and providing inputs for research studies on development of appropriate statistical methodologies relating to various components of environment and forestry sectors.
- Serving as nodal point for various Committees of the Government, including those on 'Development of Database on Climate Change' and 'Issues in the Estimation of GDP of Forestry Sector' constituted by Ministry of Statistics & Programme Implementation.
- Serving as nodal point for the periodic publications produced by the Central Statistical Organisation as per the

recommendations of the National Statistical Commission, including Compendium of Environmental Statistics and Statistical Abstracts.

In 2012-13, inputs were provided to various Committees of the Government, including those on 'Development of Database on Climate Change' and 'Issues in the Estimation of GDP of Forestry Sector' constituted by Ministry of Statistics & Programme Implementation. It also provided information for periodic publications produced as per the recommendations of the National Statistical Commission, including Compendium of Environmental Statistics and Statistical Abstracts and other publications of Central Statistical Office (CSO). Statistical Advisor served as a member of the Organising Committee constituted by the CSO for the International Seminar on Green GDP to be held during 5-6 April, 2013.

Non-Governmental Organisations (NGO) Cell

A Non-Governmental Organisation (NGO) Cell has been set up in the Ministry to handle various matters relating to NGOs working in diverse field of environment. The basic functions of the Cell are:

- Collection and dissemination of information to various NGOs.
- Liaison with the Planning Commission and other Government Ministry to create a database of various NGOs working in the field of environment and its associated areas."

Besides replying to Parliament Questions/ Assurances, the NGO Cell also disposed of 16 number of RTI applications."

Budget allocation and progress of expenditure during 2012-13

Total Twelfth Plan outlay for the ENVIS

Scheme is ₹ 70.00 crore. Against this, the Annual Plan outlay for its first year, 2012-13 was ₹ 7.86 crore, which was reduced to ₹ 7.36 crore at RE stage. Actual expenditure incurred, as on 31.01.2013, under the Scheme was ₹ 5.33 crore, showing a utilization ratio of 72.41%.

In terms of physical performance, as compared to extension of support to 47 ENVIS Centres in 2011-12, in the current year 2012-13 so far 46 Centres have been supported (as on 31.01.2013). This has also entailed visit by officers to these Centres for verification of the performance of the Centre concerned against the mandated annual activities.

Important Committees/ Commissions

The Environmental Prize Committee for the Indira Gandhi Paryavaran Puraskar (IGPP) constituted under the chairpersonship of Hon'ble Vice President of India has the following composition:

1.	Vice-President of India	Chairperson
2.	Speaker of Lok Sabha	Member
3.	Minister for Environment and Forests	Member
4.	Expert Members	Members
5.	Secretary, Ministry of Environment & Forests	Member Secretary

The Scientific Advisory Committee (SAC) of ENVIS, which oversee and monitor the functioning of the Scheme, was reconstituted on 9th April, 2012 composed is given in Table-68.

First meeting of the reconstituted SAC was held on 5th November, 2012 at Paryavaran Bhawan, New Delhi. The committee approved the revised Guidelines for ENVIS Scheme including criteria for establishment of new ENVIS Centres, monitoring mechanism, evaluation criteria, closure of non-performing Centres, infrastructure-related obligations

Table-68. Composition of Scientific Advisory Committee

1.	Secretary, Ministry of Environment & Forests	Chairperson
2.	Director General & Special Secretary (Forests) or his representative, Ministry of Environment & Forests	Member
3.	Additional Secretary (EIDivision), Ministry of Environment & Forests	Member
4.	Additional Secretary & Financial Adviser, Ministry of Environment & Forests	Member
5.	ShriKartikeya Sarabhai Founder Director Centre for Environment Education (CEE), Ahmedabad, Gujarat	Member
6.	Dr. Rakesh Goel IA/45-B, Ashok Vihar Phase-1, New Delhi	Member
7.	Dr. Rakesh Chetal 118-D, Lane No. 7, Krishna Nagar, Safdarjung Enclave, New Delhi	Member
8.	Prof. S.K. Barik Department of Botany, North Eastern Hill University, UmshingMawkynroh, Shillong, Meghalaya	Member
9.	Dr. IzharulHaqFarooqi Department of Civil Engineering, Z.H. College of Engineering & Technology, Aligarh Muslim University, Aligarh	Member
10.	Economic Adviser (EI Division), Ministry of Environment & Forests	Member Secretary

of host institution and human resources development. Recommendations of the National Workshop held at Bhopal during 29-30th August 2012 were also discussed and were agreed to be incorporated as suitable in the revised guidelines.

Conferences, including nature of participation, subjects discussed, outcomes, and implementation/ action taken on its outcomes

A two-days National Interaction-cum-Evaluation workshop for ENVIS Centres was organised by the EI Division in collaboration with the Disaster Management Institute (DMI), Bhopal during 29-30th August, 2012 to evaluate the performance of the 67 ENVIS Centres. Based on the presentations, interactions and feedback received from the participants, the two National Evaluation Committees

composed of independent experts made certain recommendations/observations for further improvement in the activities of the ENVIS Centres and betterment of the ENVIS Scheme as a whole.

A one-day User Workshop on India State-level Basic Environmental Information Database (ISBEID) was organized jointly by M/o Environment and Forests (MoEF) and National Informatics Centre (NIC) at New Delhi on 18th February, 2013 in order to demonstrate to the 28 State/UT ENVIS Centres, the features of Geographical Information System (GIS) interface of ISBEID and to address the various hurdles faced by the Centres in data collection for the Management Information System (MIS) of ISBEID.

A one-day User Workshop on ENVIS

Website Restructuring Projects was organized jointly by M/o Environment and Forests (MoEF) and National Informatics Centre (NIC) at New Delhi on 19th February, 2013 in order to demonstrate the Integrated Generic Database Design Methodology for CMS Portals to the 36 ENVIS Centres, whose websites are being restructured by NIC.

Information and Facilitation Counter (IFC)


The Information and Facilitation Counter at Paryavaran Bhawan, New Delhi is being run by CEE, a Centre of Excellence of this Ministry, since December 2005. This has been done in a unique model of partnership, and MoEF became the first Ministry in the Government to have such a wide-based public facilitation service, in contrast to most other IFCs that only hand out copies of annual reports. Over the last seven years, the IFC has performed a wide range of functions as briefly enumerated here:

- Providing broad-based information to visitors (both general public and officials) on the Ministry, its divisions; contacts of officers; directional guidance; MoEF's structure & organization, schemes, programmes, etc. This is being done both through staff manning the Helpdesk as well as a Touchscreen facility. In actual practice, IFC staff renders assistance to visitors not only regarding MoEF but also about the locations of various other Ministries and Departments in the CGO Complex, since the MoEF IFC happens to be the first facility visible to most people entering the central courtyard of CGO. Not only common people, but also MPs, MLAs and other dignitaries, senior officials, UN officials and diplomats come here and seek guidance with regards to the Ministry's programmes, schemes, etc.

There are also visits by groups such as trainee officers and probationers of Indian Forest Service, Rangers Colleges, etc. During conferences in Delhi, groups of NGOs also visit together in large numbers, which otherwise come singly throughout the year. During the summer, autumn and winter holidays, school/college students and their parents also visit in fair numbers to seek resource material (particularly pictorial material) for assignments and project work.

- Distributing MoEF's resource material (Annual Reports, Funding Schemes, Fellowships Guidelines, Research Guidelines, Brochures, Journals, Newsletters, etc). Annual Reports of up to 3 previous years (both Hindi & English) are being stocked and distributed.
- A display and reference area for publications of MoEF and its ENVIS Centres.
- Providing the first level of visitor facilitation and application guidelines for various Clearances and No Objection Certificates issued by this Ministry. These include NOC for imports of hazardous substances, environment impact assessment clearances of different projects, forest clearances, genetic engineering clearances, etc.
- Providing information about the status of various applications (for environmental clearances, project proposals for funding, grant applications under different schemes), and helping to retrieve this information from the concerned Divisions of MoEF. IFC staff also helps link up the visiting applicants to the concerned officers in various Divisions, so that clearance-related technical queries can be settled efficiently.
- Providing information to the public with

- regard to different events organised by MoEF on specific environment-related days e.g. World Environment Day functions, Ozone Day, Wetlands Day, Green Haat, schedule of the Science Express - Biodiversity Special, and so on.
- Providing information about various awards of the Ministry to the interested stakeholders and aspirants.
 - During its idle time, the Touchscreen also runs short films and AV clips on environment and nature conservation, for the casual viewing of visitors.
 - Receiving and processing RTI applications from applicants (the "in-person" channel) and when required, coordinating with the concerned Division to arrange physical inspection (under IFC custody) of records by visitors. The RTI work involves the following steps:
 - Providing blank formats for RTI applications;
 - Receiving applications from people submitting in person, and issuing acknowledgement;
 - Receiving fees in cash or DD form, and issuing acknowledgement;
 - Forwarding applications to the RTI Cell in GC Division, for routing to the relevant Division;
 - Preparing cash challans and depositing cash daily with the Ministry's Cash Section;
 - Following up with the respondent Division for timely issue of a response, including verbal reminders after 3rd week;
 - Collecting responses from Divisions and providing them to the applicants (for collection in-person) within stipulated time-frame.
 - Assisting with postal despatches of Annual Reports and other publications of MoEF.
 - Stocking and selling the priced publications of MoEF and depositing cash into the Government Account.
 - For continuous improvement and better and efficient running of IFC, visitors' feedback is obtained through a form, and comments are compiled about their perceptions of IFC's services.



CHAPTER-12

**LEGISLATION AND
INSTITUTIONAL SUPPORT**

Policy and Law

Introduction

The Policy and Law Division is partly implementing the Schemes “Assistance for Abatement of Pollution, Environment Policy and Law” and Establishment of Environment Commission and Tribunal” and providing legislative and institutional support to other thematic divisions whenever needed for any amendment to existing legislation/notification or implementation of the Environment (Protection) Act, 1986, National Environment Policy 2006, National Green Tribunal Act, 2010, Ecomark Scheme and proposal relating to establishment of National Environment Assessment and Monitoring Authority (NEAMA).

National Green Tribunal Act, 2010

The National Green Tribunal (NGT) Act, 2010 has been brought into force on 18th October, 2010. The NGT has been established for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary 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. Five places of sitting with Principal Bench at New

Delhi and Pune, Kolkata, Bhopal and Chennai as zonal benches have been notified. Delhi and Chennai Bench of the Tribunal have been operationalised. In addition to the Chairperson, 3 judicial and 9 Expert Members are working in the Tribunal.

National Environment Assessment and Monitoring Authority (NEAMA)

The Ministry proposes to establish a National Environment Assessment and Monitoring Authority (NEAMA) with domain expertise, technological finesse and field outreach in order to strengthen and professionalize the regimes of environment impact assessment and coastal zone management under Environment (Protection) Act, 1986. Constitution of NEAMA shall be a part of larger regulatory reforms exercise to improve environmental regulation.

National Environment Policy (NEP), 2006

The National Environment Policy, launched in 2006 seeks to extend the coverage, and fill in gaps that still exist, in the light of present knowledge and accumulated experience. The task of review of the National Environment Policy has been initiated.

Trade and Environment

Trade and Environment Cell

Introduction

Trade and Environment Division has the following areas of responsibility:

- Provision of technical inputs to the preparatory process in the area of Trade and Environment.
- Formulation of Ministry’s position on trade-related matters referred to it by other Ministries, including views on issues

relating to Regional/ Bilateral/ Multilateral Trade Agreements and other trade-related issues.

- Acting as Nodal Cell within the Ministry to deal with references received from M/o Commerce & Industry.
- Implementation of any on-going Project on Trade and Environment.
- Acting as Export Promotion Cell in the Ministry.

Activities undertaken during the year

The Trade and Environment Division regularly furnished comments and materials from environment, ecology, forestry and wildlife points of view to the Department of Commerce for drawing up India's position and contributing to the on-going multilateral negotiations under the Doha Development Agenda (DDA) of the Agreement on the Establishment of the World Trade Organisation (WTO), in particular, the negotiations under trade in goods and services and domestic regulations. This included, for instance, assessment of the proposed European Union's Regulation on Ship Recycling, especially its potential for impact on domestic ship breaking industry. In addition, issues emerging from the lack of availability of data in services which hinders policy-making in the area as well as adversely affects bilateral and multilateral trade negotiations in services were also taken up in the context of environmental services. Certain classification issues relating to environmental services in the context of WTO's questionnaire on Services are presently under scrutiny.

Secretary (E&F) is a Member of the Inter-Ministerial Committee on Services Issues constituted by the Department of Commerce, which held three meetings on topical matters, including coordination between different

Ministries/ Departments for issues concerning multilateral and bilateral negotiations as well as addressing supply side issues; developing a strategy to increase and diversify India's services exports in order to respond to the challenges emerging from overdependence on the surplus from only one service sector; addressing cross-cutting constraints like shortage of skilled manpower which could affect growth of services sector and ensuring that this resource pool is able to take advantage of emerging opportunities world over; suggesting measures to address domestic policy, regulatory and resource issues constraining growth of the services sector; and tackling specific barriers to market access in key markets being faced by India's service suppliers. Economic Adviser served as a Member of a number of Inter-Ministerial Sub-Groups in the field of Trade in Services as well as Non-Tariff Measures in the WTO as well as for Regional Trade Agreements constituted by the Department of Commerce this year.

During the year, various regional trade agreements under negotiation by India were examined and Ministry's contributions were provided, including on the (i) India-South Africa Custom Union (CU) Preferential Trade Agreement (PTA); (ii) India-Chile PTA; (iii) India-Australia Free Trade Agreement (FTA); (iv) India-New Zealand FTA; and (v) India-Japan Comprehensive Economic Partnership Agreement (CEPA).

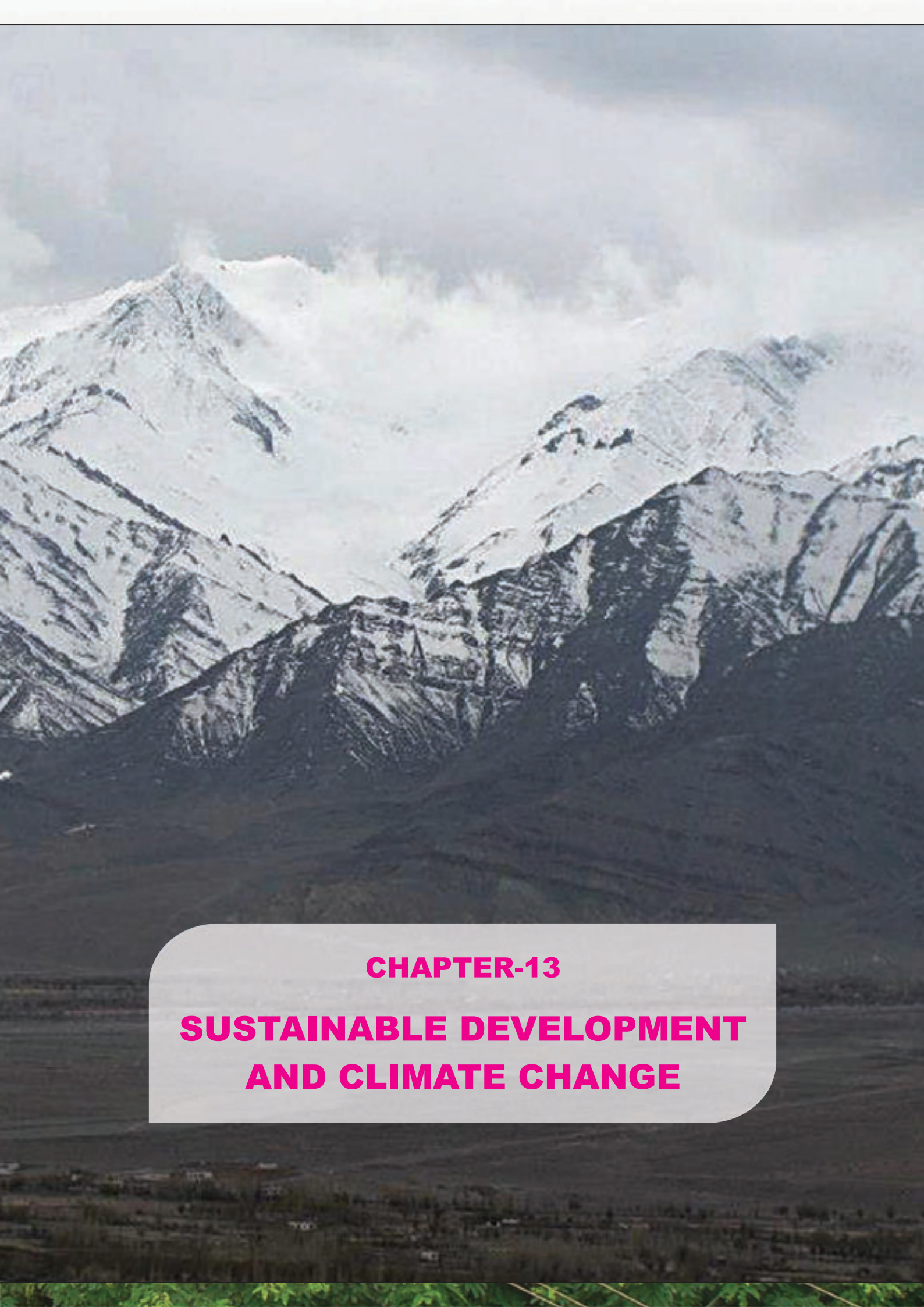
The Division also contributed to the on-going negotiations on various bilateral investment treaties and bilateral investment protection agreements, including issues such as transfer of environmentally sound technology to meet India's environmental requirements, which such bilateral investments need to encourage, and various environmental

measures that may be necessary to protect human, animal or plant life or health and/or conservation of natural resources under the Model Texts of India-US Bilateral Investment Promotion and Protection Agreement (BIPA) in the context of the Indo-US Strategic Dialogue.

The Division also worked on various diverse matters, which ranged from commenting on the issues regarding the Foreign Trade Policy of the Government and the 'Bilateral Development and Assistance: A Handbook on Systems and Processes' to the intellectual property rights and public health

in the context of the Environment Policy for Asia and Pacific Economies. This also included suggestions and comments for Submission of India Country Report to the 10th Session of the United Nations Environment Fund to be held in Istanbul in 2013.

The Division also contributed relevant materials to other Divisions of the Ministry, notably the negotiations on Climate Change and assumption of the Presidency of the Conference of Parties-11 of the Convention on Biological Diversity.



CHAPTER-13
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Sustainable Development Division

Introduction

Sustainable Development is one of the thrust areas of the Ministry of Environment and Forests and it 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.

The United Nations Conference on Environment and Development (UNCED), 2012 also called Rio+20 Summit was held in Rio, Brazil from 20th to 22nd June 2012 and was attended by Heads of State and high-level representatives from Government of a large number of countries and the civil society. India was represented by the Hon'ble Prime Minister. The delegation also included the Minister for Environment & Forests and officials from the different Ministries of the Government. The Conference renewed its commitment to sustainable development based on decisions taken in the United Nations Conference on Environment & Development (UNCED) held in Rio in 1992, Agenda 21, World Summit on Sustainable Development (Johannesburg Plan of implementation) 2002 and to ensuring the promotion of an economically, socially and environmentally sustainable future for our planet and for the present and future generations. The Conference acknowledged the need to further mainstream sustainable development at all levels, integrating economic, social and environmental aspects and their inter-linkages so as to achieve sustainable development in all its dimensions. Rio+20 Summit further recognized that poverty eradication, promoting sustainable patterns of consumption and production and protecting and managing the natural resource base for economic and social development

are the overarching objectives of and essential requirements of sustainable development.

The Conference further reaffirmed keeping the centrality of equity and the principle of common but differentiated responsibility in the global environmental discourse, placing poverty eradication at the centre of the global developmental agenda; while at the same time providing the required domestic policy space to the countries on green economy and launching of four processes/mechanisms, i.e., to develop Sustainable Development Goals, on financing strategy, on technology transfer, and to define the format and organizational aspects of the proposed high level political forum to follow up on the implementation of sustainable development.

India has, since the UNCED held in 1992, taken the process of sustainable development and socially inclusive economic growth through its Policies, Programmes and regulatory framework. These efforts have led to progress in sustainable development at the National, State and Local levels.

Following the Rio+20 Summit, the Ministry of Environment & Forests has set up an Inter-Ministerial Working Group, to firm up India's approach on "Sustainable Development Goals (SDGs)", under the Chairmanship of Additional Secretary consisting of representatives of the following Ministries: (i) Ministry of Agriculture & Cooperation, (ii) Department of Food & Public Distribution, (iii) Ministry of Road Transport & Highways, (iv) Ministry of Urban Development, (v) Ministry of Labour & Employment, (vi) Department of Ocean Development, (vii) Ministry of Home Affairs, (viii) National Disaster Management Authority, (ix) Ministry of External Affairs, (x) Planning Commission and (xi) Dept. of Economic Affairs.

United Nations Convention to Combat Desertification

The Scheme United Nations Convention to Combat Desertification (UNCCD) is dealt by Desertification Cell of the Ministry.

Brief Objectives

The objective of the division is two fold:

- To implement policies and promote policy initiatives 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

- The second Inter sessional COP Bureau Meeting, held in Bonn, Germany during 5-6 November 2012 was attended by UNCCD National Focal Point, Joint Secretary Sh B.M.S Rathore as Vice President of CoP-Bureau.

Programme Initiatives

- Proposal on "Enhancing capacity for alignment of National Action Programme to 10 year Strategy of UNCCD and for National Reporting to UNCCD Secretariat" for funding to the tune of USD 148,500 from Global Environment Facility (GEF) secretariat under cycle 5 has been approved.
- India made contribution of Euro 41,463 for the core budget of UNCCD convention biennium 2012-13

Progress/achievements made during the year

The following were important milestones achieved:

- The 5th National Report was submitted to the UNCCD secretariat on-line on 15th October 2012 using the Performance Review and Assessment of Implementation System (PRAIS). The final submitted report is available on the ministry website and can be downloaded at <http://moef.nic.in/modules/divisions/desertification-cell/?f=report2012>.
- World Day to Combat Desertification on June 17 2012 was observed and a workshop was organized at Indian Council of Forestry Research and Education, Dehradun, Uttarakhand. The UNCCD theme for this year, the workshop theme was "Healthy soil sustains your life; LET'S GO LAND-DEGRADATION NEUTRAL."

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 recognises 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

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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 COP8, 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/knowledge/docs/The%20Strategy%20leaflet-english.pdf>*
- India became a signatory to the **United Nations Convention to Combat Desertification** on 14th October 1994 and ratified it on 17th 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 co-ordinate 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 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, as a phenomenon caused by historical concentration of greenhouse gases in the atmosphere over a period of time, is a cause of concern to the entire global community. Its effect on developing countries is particularly adverse as their capacity and resources to deal with the challenge is limited. Studies indicate that climate change may exacerbate the problem of existing climate variability in India. It is projected that, by the end of 21st 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.

India's emissions are estimated to be of the order of 1331.6 million tonnes of the carbon dioxide equivalent Green House Gas (GHG) emissions in 2007. The emissions indicate an annual growth of 4.2% from the levels in 1994. However, India's CO₂ emissions are only about 4% of total global CO₂ emissions and much less if the historical concentrations are taken into account. Still, India has been conscious of the global challenge of climate change and its likely adverse impact on various sectors and ecosystems. During the year, the Ministry conducted studies to make Integrated Vulnerability Assessment across sectors so as to ascertain the nature and framework of adaptation needs.

Intergovernmental Panel on Climate Change (IPCC)

IPCC is a specialized body jointly established by the United Nations

Environment Programme (UNEP) and World Meteorological Organization mandated to prepare scientific assessments on various aspects of climate change. IPCC is currently engaged in the preparation of Fifth Assessment Report on Climate Change through three Working Groups. India is engaged with the IPCC in analyzing and critically examining the work being done under 3 Working Groups of the IPCC in phased manner. Working Group I on the Climate Change will present the physical science basis and is expected to release its full report and Summary for Policymakers in September 2013. Working Group II on climate change impacts, adaptation and vulnerability is expected to release its full report and Summary for Policymakers in March 2014. Working Group III on assessment for mitigation of climate change will release its report and Summary for Policymakers in April 2014. The Synthesis Report comprising of key findings emerging from the three Working Groups of 5th Assessment Report and will be published by IPCC in October 2014.

The IPCC has also 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/>).

Climate change and India's actions

In pursuance of the obligations cast on parties to the United Nations Framework Convention on Climate Change (UNFCCC), India has undertaken 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. The elements of information provided in the communication include a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases, a general description of steps taken to implement the Convention including an assessment of impacts and vulnerability, and any other relevant information. The communication is meant to provide the context and the national circumstances inter alia India's geography, imperative of development needs, climate and economy; based on which India would be addressing and responding to the challenges of climate change.

India has submitted Second National Communication to the UNFCCC in 2012. The first National communication (NATCOM) was submitted in 2004. The second NATCOM provides information of the emissions of Green House Gas (GHG) for the years 2000 and 2007; information of impacts and vulnerability of key sectors such as Water, Agriculture, Natural Ecosystems and Biodiversity, Infrastructure etc. NATCOM II was released by the Minister for Environment and Forests on May 10, 2012 at a National Workshop held in New Delhi.

India's domestic strategy for addressing climate change is 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. Under advice of the Central Government, State Governments are also preparing State Action Plans on Climate Change that are aimed at creating institutional capacities and implementing sectoral activities to address climate change.



Fig-58. Smt. Jayanthi Natarajan, Hon'ble Minister of State (I/C) releasing NATCOM-II at New Delhi

The government has a domestic mitigation goal of reducing emissions intensity of Gross Domestic Product (GDP) by 20-25% by 2020 in comparison with 2005 level. The energy intensity of India's output 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 under the twelfth five year plan (12th FYP). Several thrust areas have been identified in the 12th FYP for this purpose and a coordinated initiative to identify Nationally Appropriate Mitigation Actions and implement them towards this end will be taken during the Plan period.

At the initiative of the Ministry, Planning Commission has recognized climate change as a major area of environmental intervention. 'Climate Change Action Programme (CCAP)' - a new thematic/umbrella Scheme has been approved by the Planning Commission for implementation during the 12th Five year Plan. The scheme aims at advancing scientific research information 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 scheme comprises of eight activities, of which, three relate to scientific studies on climate change, two to institution and capacity building and three others to domestic and international actions.

The Ministry has already launched preparatory activities for India's Third National Communication (TNC) and Biennial Update Report (BUR), containing updates of earlier reported national GHG inventories, including a national inventory report and information on mitigation actions, needs and support received. The BURs are new reporting obligation under the transparency arrangement of sharing information on implementation of the Convention.

Various other science initiatives are planned by the Ministry as part of the Climate Change Action Programme (CCAP). These include National Carbonaceous Aerosols Programme (NCAP), Long Term Ecological Observatories (LTEO), and Coordinated Studies on Climate Change for North East region (CSCCNE). The NCAP is a major activity involving multi-institutional and multi-agency study

launched in 2011. In this initiative, Ministry of Environment and Forests will collaborate with the Ministry of Earth Sciences, the Indian Space Research Organization, the Ministry of Science and Technology and other associated agencies to enhance the understanding of the role of Black Carbon in climatic change through monitoring and assess the impacts of black carbon through various modeling techniques. The work programme envisages three Working Groups namely Long term Monitoring of Aerosol (Working Group-I), Impact of Aerosol on Himalayan Glaciers (Working Group-II) and Modeling of Black Carbon emissions inventory India and assessment of its impacts (Working Group-III).

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 already 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. INCCA has helped the Ministry put together its Green House Gas (GHG) Emissions Inventories and in carrying out other scientific assessments at more frequent intervals.

Programmes envisaged under INCCA

The Ministry is implementing Phase-II of joint research programme on Climate Change from impacts to Adaptation supported by the Department of Energy and Climate Change, Government of United Kingdom. The key areas covered in the research are impact of climate change on water and agriculture in river-basin, development of high resolution climate change scenario, State level vulnerability and adaptation in Odisha and Madhya Pradesh and

socio-economic aspects of climate change. Synthesis report of phase I of the programme can be seen on website of Indo-UK research programme (www.impactstoadaptation.org).

Preparation and implementation of State Action Plans on Climate Change (SAPCC) is one of the major activities envisaged under the CCAP. This has been allocated ₹ 100 crores by the Planning Commission during 2012-17. This will be a thrust area of action during the plan period. So far, 21 States namely Andaman and Nicobar, Andhra Pradesh, Arunachal Pradesh, Assam, Delhi, Jammu & Kashmir, Kerala, Karnataka, Lakshadweep, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tripura, Utrkhand, and West Bengal have prepared document on State Action Plan on Climate Change (SAPCC). The National Steering Committee on Climate Change (NSCCC) in the Ministry has considered and endorsed five SAPCCs of Arunachal Pradesh, Rajasthan, Madhya Pradesh, Sikkim and Tripura. Specific programmes/activities/projects envisaged under the SAPCC will be financed under the CCAP as per the guidelines prepared by the Ministry and on the basis of agreed criteria and principles. In addition, the State Government may mobilise bilateral and multilateral support for implementation of the activities as per the priorities set under the SAPCC.

The Ministry has been implementing several projects with the assistance of bilateral and multilateral funding agencies such as Gesellschaft für Internationale Zusammenarbeit (GIZ), Kreditanstalt für Wiederaufbau (KfW), World Bank, United States Agency for International Development (USAID) and Asian Development Bank (ADB). GIZ has been supporting the Ministry under ASEM programme for a Clean

Development Mechanism (CDM) Cell and an adaptation project. A new project for supporting 'Nationally Appropriate Mitigation Actions' with GIZ support is being considered. USAID has agreed to support a REDD+ project for sustainable forestry management for an outlay of US \$ 27 million over five years. With the assistance of this Ministry, the World Bank has sanctioned a US \$ 400 million project for climate change and sustainable development in Himachal Pradesh. A project with World Bank for 'Partnership for Market Readiness' is under active consideration. The Global Environment Facility (GEF) has also approved a number of activities in relation to climate change during the fifth cycle of funding (2013-17). Some of the important activities that will be carried out with GEF support are in the area of energy efficiency, renewable energy, national communication and the state action plans. Asian Development Bank is involved in the Bhutan initiative on climate change for the four Himalayan countries, namely, India, Bhutan, Bangladesh and Nepal.

International regime for climate change

Under the existing international regime for addressing climate change, several rounds of intense negotiations have taken place to advance implementation of the commitments of the parties and to enhance their actions and ambition. In 2012, the Bali track of negotiations came to an end and the new process of negotiations launched under the Durban Platform got underway. The Durban Platform is aimed at securing consensus on the future arrangements applicable to all during the post 2020 period. As part of this process, the countries are expected to implement their

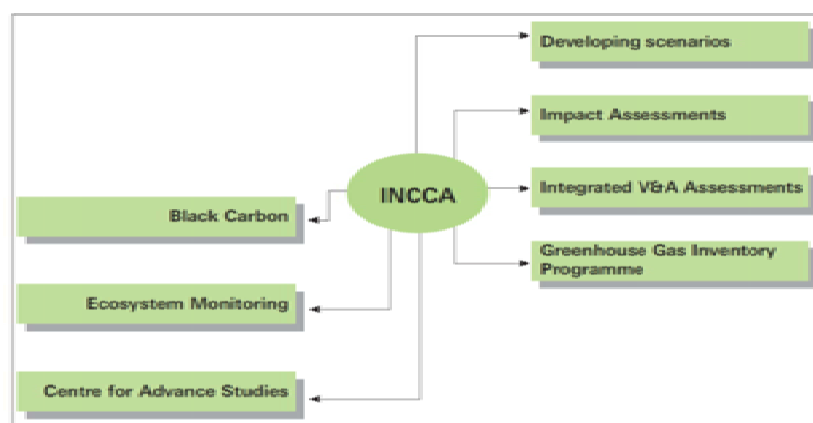


Fig-59. Programmes envisaged under INCCA

voluntary Copenhagen pledges for mitigation subject to transparency arrangements till 2020 and enhance their ambition, as necessary, for stabilising the climate in accordance with the principles and provisions of the Convention.

Under the existing international regime, carbon markets have been established to facilitate reduction of carbon/GHG emissions at the global level through sale and purchase of carbon credits. The Indian Government and industries have been very proactive in the international carbon market. India has a good potential for CDM Projects. Today, India's CDM potential represents a significant component of the global CDM market. At the end of 2012, 961 out of total 5,195 projects registered by the CDM Executive Board are from India, which is the second highest by any country in the world. The National CDM Authority (NCDMA) in the Ministry has accorded Host Country Approval to 2786 projects facilitating possible investment of more than ₹ 549,429 crores. These projects are in the sectors of energy efficiency, fuel switching, industrial processes, municipal solid waste, renewable energy and forestry which spread across the country (covering all states in India). If all these projects get registered by the CDM Executive Board, they have the potential to generate 720 million Certified Emission Reductions (CERs) by

the year 2012. At a conservative price of US \$ 5 per CER, it corresponds to an overall inflow of approximately US \$ 3.6 billion in the country by the year 2012 if all the projects get registered. As on date CERs issued to Indian projects is 155 million.

However, the carbon markets have become weak in the wake of low ambition for emissions reductions expressed by developed countries under the Kyoto Protocol. The unilateral measures taken by some key parties to restrict the benefits of CDM to large developing countries like India and China has further reduced the confidence in the ability of the international markets to help the cause of climate change. The decision of the European Union to impose a unilateral levy on civil aviation emissions of aircrafts from other countries has led to international protests and demands have been made to resolve the matter in the International Civil Aviation Organisation in accordance with the principles of the UNFCCC. There are other areas where higher ambition is needed such as the climate change finance and flow of technologies. The Green Climate Fund set up at Cancun is yet to see any major flow of funds from the developed countries. While the Technology Mechanism envisaged under the Cancun Agreements has become functional, there is no significant progress on development and transfer of technologies for large scale transformation in developing countries. In the coming years, effective fulfillment of their commitments by developed countries will be an important signal for confidence in the evolving process to gain momentum.

Doha Conference 2012

The recent UN Climate Change Conference held in Doha from November 26 to December 8, 2012 was significant as it was held in the

terminal year of the first commitment period of the Kyoto Protocol (2008-12). The Doha Conference took several decisions as part of a package, together known as 'Doha Climate Gateway', which has not only helped launch the second commitment period under the Kyoto Protocol but also advanced implementation of the United Nations Framework Convention on Climate Change (UNFCCC).

Key Doha Outcomes were:

- The biggest achievement of Doha Conference is the adoption of amendments to the Kyoto Protocol making the second commitment period (CP2) of emissions reduction by the Annex I countries parties to the Kyoto Protocol effective immediately beginning January 1, 2013. Although the emission reduction obligations undertaken by the Annex I parties are not as ambitious as required by science, it has been agreed to implement the targets over an 8 years period (2013-2020), thus providing relative degree of certainty to the carbon markets. EU, the major KP Party will reduce its emissions by 20% by 2020 compared to 1990. It has been agreed that the KP parties will revisit their targets in 2014 with a view to increasing their ambition. This decision, along-with provisional application of the amendments on an 'opt-in' basis has ensured that there will be no gap between the first commitment period under the KP ending on December 31, 2012 and the second one commencing on January 1, 2013. Decisions to restrict the carry-over of surplus assigned amount units from the first commitment period and access of Annex I Parties who do not quantified emission reduction and limitation commitments under the second commitment period to the flexibility

mechanisms under the Kyoto Protocol will have a salutary effect on the environmental integrity.

- As a part of a comprehensive decision on agreed outcome pursuant to Bali Action Plan, Doha reasserted the principles of Equity and Common But Differentiated Responsibilities, which have remained subdued since Copenhagen. The Conference has explicitly recognized that the action of parties will be based on equity and CBDR including the need for equitable access to sustainable development. The decisions have also avoided quantitative target for global emissions reduction or global peaking that could place a cap on emissions of developing countries and restrict their development space.
- The issues of Technology-related Intellectual Property Rights (IPRs) and the Unilateral Measures are firmly back on the table. These outstanding or unresolved issues under the Bali Action Plan (BAP) are now part of the planned or continuing work of various bodies of the Convention. Based on the decisions, the Technology Executive Committee (TEC) will initiate exploration of the issues relating to enabling environments and barriers, including IPRs in its future work-plan. TEC has already identified IPRs as one of the key messages on which further work is necessary in this area. Similarly, a decision has been taken to facilitate discussion on the issue of Unilateral Measures under the existing Forum on implementation of Response measures.
- The Work Programme on Long term Finance launched last year at Durban has been extended for another year. The Standing Committee (on Finance) of the Convention has been entrusted

with the task of recommending suitable arrangements for accountability of and reporting on its functions by the Green Climate Fund to the Conference of Parties.

- In a significant and positive advancement in the work of the Durban Platform (DP) set up last year for devising the post-2020 arrangements, it has been agreed that the work of the Durban Platform will be based on the principles of the Convention. A Plan of Work has been agreed for 2013. The ADP will call for parties' submissions to be presented by March 2013 on 'vision' of the post-2020 arrangements as well as 'ambition' for raising the global efforts aimed at reducing emissions in the pre-2020 period. The ADP will organize a series of workshops as part of its work next year with a view to finalize a text for 2015 Agreement by the end of 2014. As announced by the UN Secretary General, the decision recognizes the possibility of holding a meeting of Heads of Governments and States in 2014 to finalize the Agreement.

At the Doha Conference, India took lead in bringing the three issues of Equity, Technology-related IPRs and the Unilateral Measures firmly back on the table. India also ensured that agriculture, being a sensitive sector of our economy, was prevented from being included in the mitigation work programme proposed to be launched at the global level.

Amongst the key concerns which the Conference could not address are those relating to financing commitments of developed countries and cooperative sectoral actions. There was no decision on scale or sources of financing in the near term (2013-2015), mid-term (2015-2020) or long term (post 2020). The decision merely urges the developed



Fig-60. Smt. Jayanti Natarajan, Minister of State (I/C) for Environment and Forests with the Environment Ministers of Basic Countries at the Press Conference after the conclusion of their meeting at New Delhi

country Parties to announce climate finance pledges when their financial circumstances permit and to further increase their efforts to provide resources of at least to the average annual level of the fast-start finance period for 2013-2015. The issue of 'Loss & Damage' caused by climate change that was pressed by the small island countries was almost brushed aside until the last moment, when the pressure from developing countries forced a decision to establish at the next Conference of Parties, institutional arrangements, such as an international mechanism to address loss and damage associated with the impacts of climate change in developing countries that are particularly vulnerable to the adverse effects of climate change.

The year 2012 was also marked by several parallel international initiatives on

climate change. India organised the Xth BASIC Ministerial Meeting on Climate Change in New Delhi during 13-14 February, 2012 to facilitate exchange of views on outcomes of the Durban Conference and evolution of common BASIC position on key issues in climate change. Besides the BASIC countries comprising of Brazil, South Africa, India and China, representatives of Swaziland, Singapore and Qatar were also invited to the meeting. During the year three more meetings of the BASIC group were held in different locations in South Africa, Brazil and China. India also participated in the meetings of the Major Economies Forum and the organized by the United States of America (USA) and the Petersberg Dialogue initiated by Germany.

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.

Ozone Layer Protection

Introduction

- Ozone, a tri-atomic molecule of oxygen is formed from oxygen naturally in the upper levels of the Earth's atmosphere by high-energy Ultraviolet (UV) radiation from the Sun. About 90 per cent of Ozone formed in this way lies between 10 and 50 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-B radiation. The UV-B radiation has the potential to cause skin cancer, eye cataract, suppress body's immune system, decrease crop yield etc., which led to the adoption of the Vienna Convention for the Protection of the Ozone Layer in 1985 and the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. India is a Party to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer and it's all the amendments.
- India was mainly producing and using nine of the 96 Ozone Depleting Substances (ODSs) controlled under the Montreal Protocol. These are Chlorofluorocarbons (CFCs) viz. CFC-11, CFC-12, CFC-113; Carbon Tetrachloride (CTC), Hydrochlorofluorocarbon-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 phasing out of Ozone Depleting Substances (ODSs) was prepared in 1993 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 viz. Technology and Finance Standing Committee (TFSC) and Standing Committee on Monitoring. The ESC is overall responsible for implementation of the Montreal Protocol provisions, review of various policies and implementation options, project approval and monitoring.

The Vienna Convention for the protection of the Ozone Layer and its Montreal Protocol on substances that deplete the Ozone Layer

- The Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer are the specific and dedicated International Treaties for the protection of the Earth's Ozone Layer. Montreal Protocol has been recognized as the most successful International Environmental Treaty in history. It has received Universal Ratification from all the 197 Parties of the

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World. In the 25 years of its operation, extraordinary international cooperation under this agreement has led to phase-out of production and consumption of several major ODSs such as Chloro fluoro Carbons (CFCs), Carbon Tetrachloride (CTC) and halons globally by 1st January, 2010. This amounts to phase-out of 98% of the Ozone Depletion weighted level of the global production and consumption of all the chemicals controlled by the Montreal Protocol. It has not only protected the stratospheric ozone but it has also immensely benefitted the climate system. As per experts estimates, the Montreal Protocol has reduced Green House Gas (GHG) emissions by 11 gigatonnes Carbon Dioxide (CO₂) equivalent per year through its ODS phase-out activities.

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 19.7.2000. 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 1.1.2010 except use of pharmaceutical grade CFCs under Essential Use Nominations (EUN) in manufacturing of Metered Dose Inhalers (MDIs) for Asthma and Chronic Obstructive Pulmonary Disease (COPD) patients. Further, the use

of methyl bromide has been allowed in developing countries including India upto 1.1.2015 as per the Montreal Protocol schedule. Since, Hydrochlorofluorocarbons (HCFCs) are used as interim substitute to replace CFCs, their production and consumption are allowed upto 1.1.2030.

- The ODS rules are being further amended to align with the control measures 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 2012-13.

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 23rd January, 1995 adopted a resolution 49/114 which proclaims 16th 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 16th September, 1987.
- Awareness activities at the national and state levels were organized to sensitize the stakeholders to phase-out the ODS

- in various sectors. The International Day for the Preservation of the Ozone Layer is being organized every year in the country on 16th September, at national and state levels since 1995.
- "Montreal Protocol: India's Success Story", posters, stickers are brought out every year on the occasion of International Day for the Preservation of the Ozone Layer 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 (MEA-REN), Meeting of the Parties (MOP) and other Montreal Protocol related meetings.
 - Data on production, consumption, export, import of ODSs is 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 Multilateral Fund (MLF) Secretariat and recommending projects for fiscal incentives. In the year 2012, three meetings of TFSC were held and 21 duty exemption certificate were issued.
 - No Objection certificates for 111 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 19th 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 timeline for its smooth and effective implementation.
 - An India-US Task Force was established to enhance the understanding of stakeholders on issues related to Hydrofluorocarbons (HFCs) under the Co-Chairmanship of Mr. J.M Mauskar, the then Special Secretary, MoEF and Mr. Daniel A. Reifsnyder, Deputy Assistant Secretary, USA. The Members of the Task Force were drawn from Government, industry associations and scientific and technical institutions from India as well as USA.
 - The First Task Force report was prepared by India and US and it was circulated among the Members of the Task Force. Subsequently, a Meeting of the Task Force was convened in New Delhi in June, 2011 where Members of the Task Force from USA and India and other stakeholders participated in the Meeting.
 - The Task Force report was updated based on the inputs received from the Members and industry associations. A number of Meetings of the two Government officials


- were convened to seek clarifications on various sections of the report. The finalization of the Task Force report is in progress.
- The following workshops were conducted during this year :
 - Two workshops on Sustainability of CFC Phase-out in India were organized by the Ozone Cell, MoEF in association with United Nations Environment Program (UNEP) on 4th April, 2012 at Chennai and 10th April, 2012 at Guwahati.
 - Organized Stakeholders Consultative Meeting on Proposed Amendment to Ozone Depleting Substances (Regulation and Control) Rules, 2000 on 12th October, 2012.
 - Organized Interagency Meeting for finalization of modalities of implementation of HPMP Stage-I on 14.9.2012.
 - In addition to these, Workshops, Seminars and consultative meetings with the stakeholders were also organized on a regular basis for interaction with industry, Government departments and organizations etc.
 - The HCFC Phase-out Management Plan (HPMP), to comply with 2013 and 2015 targets, has been prepared in close cooperation with the UNDP, the lead implementing agency, UNEP and GIZ in consultation with the stakeholders, industry, industry associations, line Ministries and other concerned Government Departments, large HCFC consuming organizations including Defence, Indian Railways, Department of Science and Technology etc.
 - The HPMP Stage-I has been approved by the Ex-Com of the MLF in its 66th Meeting held in April, 2012 for the period 2012-2015 to reduce 341.77 Ozone Depleting Potential (ODP) tonnes of HCFC from the starting point of 1691.25 ODP tonnes with a total funding of US \$23,011,537 including implementing agency support cost.

Achievements made

- India has met the following compliance targets either on or ahead of the control schedule of the Montreal Protocol:-
 - Phase-out of production and consumption of virgin halons as early as 2002 being high ODP ODS, eight years prior to the Montreal Protocol schedule.
 - Prohibition of use of CFCs and halons in manufacturing of new equipments as early as 1.1.2003. This not only facilitated early phase-out of ODSs in the country, but also reduced the inventory of ODS based equipments which resulted in reduction of use of CFCs for servicing.
 - Phase-out of production and consumption of CFCs with effect from 1.8.2008, 17 months prior to the Montreal Protocol schedule except use of Pharmaceutical grade CFCs in manufacturing of MDIs.
 - Complete phase-out of production and consumption of CTC and halons with effect from 1.1. 2010.
 - Successful implementation of the National Strategy for transition to non-CFC MDIs and plan for phase-out of CFCs in the manufacture of pharmaceutical MDIs in India.
 - India in consultation with the MDI manufacturers withdrew 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.
- HPMP Stage-I was approved at the 66th Ex-Com of the MLF held in April, 2012 with a total funding of US \$23,011,537 to meet 2013 and 2015 HCFC phase-out targets.
 - The Ex-Com of the MLF so far has approved a total of 302 projects involving MLF funding of US \$278,722,203 to the Indian industry for phase-out of production and consumption of 58,980 ODP tonnes of the ODSs in India.
 - 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 year 2012 marks 25th Anniversary of the Montreal Protocol on Substances that Deplete the Ozone Layer. The Ozone Cell, MoEF celebrated the 18th International Day for the Preservation of the Ozone Layer on 13th September, 2012. The theme for the 18th International Day for the Preservation of the Ozone Layer for year 2012 was: **“Protecting our atmosphere for generations to come”** emphasizing the extraordinary collaboration and environmental benefits achieved by the world’s Governments through the operation of the Montreal Protocol. On this occasion an Exhibition of non-ODS technologies developed and marketed by various industries in the country was organized. Around 600 school children, policy makers, technocrats and Government officials participated in the function.
 - On this occasion, the publication “Montreal Protocol: India’s Success Story” was released and distributed to the participants. In addition, 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 24th MOP to the Montreal Protocol on Substances that Deplete the Ozone Layer was held at the Geneva, Switzerland from 12th to 16th November, 2012. India played a key role during the deliberations of various issues, including proposed amendments to the Montreal Protocol to bring phase-down of HFCs under the ambit of the Montreal Protocol, clean production of HCFC-22 through by-product emission control, differences between data reported on imports and data reported on exports, feedstock uses of ODS, proposal on funding of production facilities for HCFCs etc..
 - The Ozone Secretariat appreciated India’s contributions to the accomplishments of the 24th MOP. The Executive Secretary of the Ozone Secretariat on behalf of the Parties of the Montreal Protocol conveyed the appreciation for the hard work and skillful Chairmanship as the Co-Chair of the contact group on differences between imports and exports, nurtured the productive discussions leading to the significant decisions being adopted.
 - India has been elected as a Member of the Ex-Com of the MLF for the implementation of the Montreal Protocol for the year 2013.
- Awards & Appreciations received so far
- The Montreal Protocol, Ozone Secretariat awarded a certificate of recognition to Dr. A. Duraisamy, Director, Ozone Cell, MoEF

- in appreciation of extra ordinary efforts and leadership in phasing-out of CFCs in MDI Manufacturing sector.
- The 22nd MOP of the Montreal protocol held from 8th to 12th 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.
 - A Certificate of Recognition was conferred to the Ozone Cell of India for compliance with 2010 obligations to the phase out of Annexure-A, Group-I, Group-II and Annexure-B, Group-I, Group-II Substances in October, 2011 by the Ozone Secretariat for the Vienna Convention and the Montreal Protocol.
 - Certificate of Appreciation / Recognition was awarded to the Ozone Cell of India by The Ozone Secretariat for the Vienna Convention and the Montreal Protocol, UNEP on 16th September, 2012 on the occasion of the 25th Anniversary of the Montreal Protocol for its vital role in protecting the ozone layer for generations to come.
 - Certificate of Appreciation / Recognition conferred to Dr. A. Duraisamy, Director, Ozone Cell by The Ozone Secretariat for the Vienna Convention and the Montreal Protocol, UNEP on 16th September, 2012 on the occasion of the 25th Anniversary of the Montreal Protocol for his vital role in protecting the ozone layer for generations to come.



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 UN Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD), Basel Convention on Trans-boundary Movement of Hazardous Substances, Vienna Convention for the Protection of the Ozone Layer, Montreal Protocol on Substances that deplete Ozone Layer, UN Convention to Combat Desertification (UNCCD), Kyoto Protocol, Stockholm Convention on Persistent Organic Pollutants, Rotterdam Convention, Ramsar Convention etc.

International Co-operation (IC) Division within the Ministry coordinates all issues related to international environmental cooperation. The IC Division is the nodal Division for United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), the World Bank, United Nations Industrial Development Organization (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), Association of South-East Asian Nations (ASEAN), Asian Development Bank (ADB), 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.

The Division supports annual contributions to various UN and other international bodies, like Environment Fund of UNEP, Convention on Biological Diversity (CBD), UNFCCC, UNCCD, SAARC, SACEP, Integrated Mountain Development (ICIMOD), etc.

Progress/Achievements during the year

United Nations Environment Programme (UNEP)

- Established in 1972, the United Nations Environment Programme (UNEP) aims at encouraging partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generation.
- Based in Nairobi, Kenya, the UNEP ensures 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 (GC) / Global Ministerial Environment Forum (GMEF) of the UNEP is a high level environment policy forum, which brings the world's environment ministers together to deliberate upon important and emerging policy issues on environment. The Council/ Forum meets annually in Nairobi, Kenya in general sessions and outside Kenya in special sessions in alternate years.
- The UNEP GC / GMEF had organized its 12th Special Session in Nairobi, Kenya from 20-22 February, 2012. The Ministerial consultation had flagged multifarious environmental issues under overall themes of "The environmental agenda in the changing world: from Stockholm (1972) to Rio (2012)", further focusing the discussions on the lines of three broad themes, namely

- (i) The Global Environment Outlook and emerging issues: setting effective global environmental goals;
 - (ii) The green economy; and
 - (iii) The Institutional Framework for Sustainable Development including the concluding discussion on “Rio+20 and beyond: responding to the challenges”
- The Indian Delegation to the 12th Special Session of the GC / GMEF was led by Additional Secretary from the Ministry and included Joint Secretary in charge of IC Division, Director (Chemicals/Hazardous waste Division), Director (Sustainable Development Division) alongwith the representatives of Ministry of External Affairs and High Commission of India, Nairobi.
 - The Indian Delegation had contended that the foremost priority at this stage, as we approached Rio+20, was to evaluate all that had happened, and much that had not happened, in the last 20 years, and what remained to be done (for environment protection). While doing so, we needed to recognize that poverty eradication continued to be the most important challenge before the world and our overriding priority. Equity, poverty eradication and balance between the three pillars of sustainable development were required to remain at the very heart of our efforts for environment protection and management. It was also important that the unsustainable patterns of consumption and lifestyle of the developed world be rationalized to release ecological space for equitable and sustainable growth of the world.
 - It was stressed by India that the Rio Principles should, under no circumstances,

be diluted in a bid to define a new framework of actions. Further, the framework of actions needed to be anchored in the principles of equity and common but differentiated responsibilities, the principle of right to development, the principle of the sovereign right of States over their natural resources and principle of Multilateralism.

- The proceedings of the 12th Special Session of GC/GMEF may be seen at UNEP website at <http://www.unep.org/gc/gcss-xii/docs/Proceedings/K1280542%20-%20e-GCSS-XII-14.pdf>.
- The 27th Session of the GC / GMEF of the UNEP will be held in Nairobi, Kenya from 18-22 February, 2013 on the theme “Rio+20: From Outcome to Implementation”. India will participate in this session.
- Government of India provides contribution to the UNEP Environment Fund annually at the rate of US \$ 100,000. Contributions upto the calendar year 2012 have been paid to the UNEP Secretariat.

UNEP’s International Resource Panel and Steering Committee

- In 2007, the UNEP constituted the International Resource Panel (IRP) which is a scientific panel of 25 experts from leading institutions around the world involved with all aspects of resource use and management. The IRP supports science-based policy making on use of natural resources and green economy strategies by providing scientific assessments and expert advice.
- The panel is co-chaired by Prof. Ernst Ulrich von Weizsacker, former Chairman of the Bundestag Environment Committee (Germany) and Dr. Ashok Khosla, Founder

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of the Development Alternatives, New Delhi, India and is supported by a Steering Committee having representatives of many governments, the European Commission and other intergovernmental and civil society organizations. India is a member of the Steering Committee and takes part in its meetings as and when required.

Global Environment Facility (GEF)

- The Global Environment Facility (GEF) was set up in 1991. India is a founder member of GEF (www.gefweb.org), the largest multilateral funding mechanism providing incremental project grant to the developing countries on global environmental issues with local benefits. 182 governments are the members of the GEF. India is both a donor and recipient of GEF grant.
- 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.
- India chairs and represents the GEF South Asia Constituency (comprising of Bangladesh, Bhutan, Nepal, Maldives and Sri Lanka) in the GEF Council meetings twice a year. The 5th GEF South Asia Constituency meeting was hosted by the Government of Maldives in Male focusing on GEF 5 operational and programming issues.
- GEF provides funding for projects related to five areas related to environment

viz., Biodiversity, climate change, land degradation, international water and chemicals. Since its inception in 1991, the GEF has provided USD 10.5 billion as project grant in more than 165 countries while leveraging a co-financing of USD 51 billion. Till date, India has accessed about USD 438 million of GEF grant of which USD 76.081 million was accessed during 2012-13. These projects range from promoting energy efficiency and renewable energy in different industrial and commercial sectors, mainstreaming biodiversity concerns into major developmental sectors, promoting sustainable land and ecosystem management practices, demonstrating environment-friendly technologies of handling printed circuit boards and health care waste and facilitating the preparation of India's national reporting to CBD, UNFCCC and UNCCD.

Small Grants Program (SGP) India

- GEF Small Grants Program (SGP) provides project grant upto 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, Ahmedabad 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 have been awarded GEF grant worth USD 7.1 million which has also facilitated USD 8.9 million of co-financing. Under, GEF Operational Programme 5, SGP has received a GEF grant of USD 5 million.

- This Ministry was operationalizing the Gol-UNDP-GEF project: Scaling up of Small Grant Programme (SGP) through the Centre for Environment Education, Ahmedabad. This project was initiated in 2007 for a period of 2 years and subsequently extended upto December, 2012 with the total external aid of USD 700,000. Under this project, 14 small grant programmes were taken up for replication and were successfully completed by December, 2012. These projects aimed at permanent livelihood up gradation by supporting income generation activities for community people especially tribal population. The replication of these projects created food security and livelihood generation, conservation of forest ecosystem, reduction in biotic pressure on the forests due to livelihood opportunities, augmentation and reclamation of water resources, adaptation of improved land use practices, conservation of agro-biodiversity, sustainable agricultural practices among tribal women, and awareness about environment pollution. With these projects, 7450 households in nearly 54 villages of Odisha, Madhya Pradesh, Uttar Pradesh, Karnataka, Rajasthan, and Jharkhand were benefited.
- SGP grant applications can be submitted year round.

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 peoples 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 and 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.

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.
- India is a member of the SACEP and the 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 @US\$ 31,850 per annum.

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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.

ASEAN-India Environment Ministers' Meeting:

- The Association of South East Asian Nations (ASEAN), established in 1967 in Bangkok, is a geo-political and economic organization of ten countries located in Southeast Asia (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam). The aims of ASEAN are accelerating economic growth, social progress and cultural development among its members, promotion of regional peace and stability

in collaboration and mutual assistance on the matters of common interest amongst member states etc.

- India is associated with the ASEAN for a long time and had become a sectoral dialogue partner of ASEAN in 1992. At the 7th India-ASEAN Summit in October, 2009, India had announced a contribution of US\$ 50 million to the India-ASEAN Co-operation Fund to support India-ASEAN projects across a range of different sectors. India had also set up a US\$ 5 million India-ASEAN Green Fund for pilot projects to promote adaptation and mitigation technologies in the field of climate change and biodiversity.
- This Ministry hosted the ASEAN-India Environment Ministers' Meeting on September 7, 2012 in New Delhi, which was co-chaired by Mrs. Jayanthi Natarajan, Minister of State (Independent Charge) for



Fig-61. ASEAN - India environment ministers meeting 7th September 2012 new delhi

Environment and Forests, Government of India and Mr. Pehin Orang Kaya Indera Pahlawan Dato Seri Setia Awang Haji Suyoi Bin Haji Osman, Minister of Development, Brunei Darussalam and Chair of the ASEAN. This meeting was preceded by the Senior Officers' Meeting of ASEAN and India on September 6, 2012.

- Both sides discussed various aspects of biodiversity governance in the context of the Eleventh Conference of Parties (CoP-11) to the Convention on Biological Diversity (CBD) which was subsequently hosted by India in Hyderabad from October 1 to October 19, 2012.
- The Meeting unanimously adopted the 'New Delhi ASEAN-India Ministerial Statement on Biodiversity' whereby both sides agreed to enhance awareness among all stakeholders, strive towards mainstreaming biodiversity concerns into development processes, enhancing priority in terms of resource allocation and mobilization for biodiversity conservation, and to create networks for sharing best practices in conservation and resource enhancement in marine and its related ecosystems.
- Both sides also agreed to work together for conservation and management of flagship species and enhancing conservation management and sustainable utilization of Coastal and Marine Biodiversity. Both sides also agreed to meet and exchange views on issues of common interest at



Fig-62. 3rd Meeting of Indo-French Joint Working Group on Environment at New Delhi on 01.02.2013

appropriate ASEAN Environment Ministers' Meetings.

Bilateral Cooperation

Ministry of Environment and Forests has entered into bilateral cooperation agreements with a number of countries such as the USA, UK, Canada, China, Germany, Denmark, Sweden, Norway, Finland, Bangladesh, Egypt, etc. Most of these agreements are operated through the Joint Working Groups. These agreements provide a mechanism for international interactions and consultation in the field of environment.

The main activities undertaken during the year

Organisation of Conference of Parties to the Convention on Biological Diversity

- The 11th meeting of the CoP-XI to the CBD and 6th meeting of the Conference of Parties serving as Meeting of Parties (CoP/MoP-6) of Cartagena Protocol on Bio-safety was hosted for the first time in India, at Hyderabad from October 1-19, 2012.



Fig-63. Prime Minister of India inaugurating the High Level segment of the CoP 11 to CBD at Hyderabad on 16th October, 2012

- The Conference was attended by approximately 15000 participants from 193 member countries. The High Level Segment, which was inaugurated by the Hon'ble Prime Minister, was attended by Ministers from several countries, top representation from the United Nations, bilateral, multilateral agencies, private sector, financial institutions, academia, civil society organizations and other stakeholders. An international exhibition was also organized on the sidelines to provide an opportunity for Governments and non governmental organizations to show-case their initiatives for biodiversity conservation. A number of side events were also organized at the Conference.
- The preparation and planning for hosting this prestigious event was undertaken about a year and a half in advance. The successful organisation of the Conference is being lauded by the international community for its flawless logistics and time-bound precision.

6th Meeting of the India-EU Environment Forum

- The 6th Meeting of the India-EU Environment Forum was held on 21st November, 2012 at New Delhi. The theme of the meeting was 'Sustainable Forestry and Biodiversity'. The meeting was co-chaired by Shri M. F. Farooqui,

Special Secretary (MoEF) and Mr. Timo Makela, Director for International Affairs, Directorate General Environment, European (European Commission). The deliberations/ presentations were held on following topics :-

- Illegal Logging and Biodiversity
- Sustainable Tourism and Biodiversity
- Biodiversity: Lifestyles or Livelihoods
- EU-India Co-operations on Sustainable Forestry and Biodiversity.

Bilateral meetings at CoP XI to Convention on Biological Diversity

- On the sidelines of CoP XI to CBD held at Hyderabad during 1-19 October, 2012, Bilateral Meeting with Ministers/ Heads of Delegations of Brazil, Mexico, Malaysia, South Africa, Kenya, Norway, Philippines, Bolivia, Australia, Germany, Japan, European Union, France, United Kingdom, Somalia, New Zealand and Ivory Coast were held. Apart from discussing issues pertaining to ongoing CoP XI, matters concerning common interests in the field of Environment were also discussed during the meetings.

Activities Scheduled

- The bilateral Joint Working Group Meetings on Environment with European Union (EU), India Brazil South Africa (IBSA), France, Germany, Sweden & Norway are proposed in the year 2013-14.
- Memorandum of Understanding (MoU) between India and Brazil on cooperation in the field of Environment is also proposed to be signed in the year 2013-14.

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), French Development Agency (AFD), World Bank (WB), etc.

The projects help for promoting afforestation, biodiversity conservation, rehabilitation of degraded forest areas, water and soil conservation measures, farm forestry, agro forestry, community development and institutional capacity development with the aim to increase forest and tree cover as well as to augment availability of fuel wood and fodder, improve livelihood opportunities and quality of life of the villagers adjoining forests, strengthening Joint Forest Management (JFM) 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 also help in livelihood activities through convergence with other line departments and other govt. schemes with a view to augment the income of the people, help in better living conditions and employment generation as well as addressing the sustainability in perpetuity once the funding ceases to flow due to completion of the project.

At present, there are 14 EAPs under implementation. Out of these, thirteen are State Sector Forestry Projects being implemented in States and one is a Central Sector project titled "Capacity Development for Forest Management and Training of Personnel" being implemented in 11 States. 12 State Sector Projects and the Central Sector Project are being funded by JICA and one State Sector Project is being funded

by AFD. The total outlay of all these projects is ₹7474 Crores. JICA projects are implemented in the States of West Bengal, Rajasthan, Tamil Nadu, Sikkim, U.P, Gujarat, Tripura, Himachal Pradesh, Odisha, Karnataka and Haryana. French Development Agency (AFD) project has started in Assam. Details of projects under implementation, their components, project cost, project period and project objectives etc. are given in the Table-69.

Projects under consideration for external assistance

The following forestry projects have been included for consideration under the Rolling Plan for external funding during 2012-13.

- Integrated Forest Resources Management Project in Jammu & Kashmir
- Nagaland Afforestation and Eco-development project

Projects under appraisal/ clearance stage for external assistance

The following projects are proposed to be forwarded to external agencies for consideration in 2012-13:

- Simultaneous Treatment of Fringe Forest and Adjoining Non- forestlands for Conservation of Water, Bio-diversity, Sustainability of JFM and Poverty Alleviation (Central Sector Project), National Rainfed Area Authority (NRAA).
- Non Timber Forests Produce – Livelihood Possibilities in Uttarakhand.
- "PALAS- Project for Advancement of Livelihood and Forestry for ecological security" in the State of Jharkhand.
- Andhra Pradesh Forest Productivity Enhancement Project.

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Table-69. Details of Ongoing Externally Aided Projects

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
1.	West Bengal Forestry and Biodiversity Conservation Project	West Bengal	406	JICA	To improve forest ecosystem and conserve biodiversity by undertaking afforestation, regeneration and wildlife management activities through Joint Forest Management approach, including institutional capacity development, thereby contributing to environmental conservation and harmonized socio-economic development of West Bengal	(I) Afforestation (II) Biodiversity Conservation (III) Community Development (IV) Institutional Capacity Development	2011-12 to 2019-20
2.	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

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
3.	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
4.	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 activities including eco-tourism for the community development, thereby contributing environment conservation and harmonized socio-economic development of Sikkim.	(i) Forest and biodiversity conservation (ii) Eco -tourism (iii) Joint Forests Management (iv) Supporting Activities (v) Consulting Services	2010-11 to 2019-20

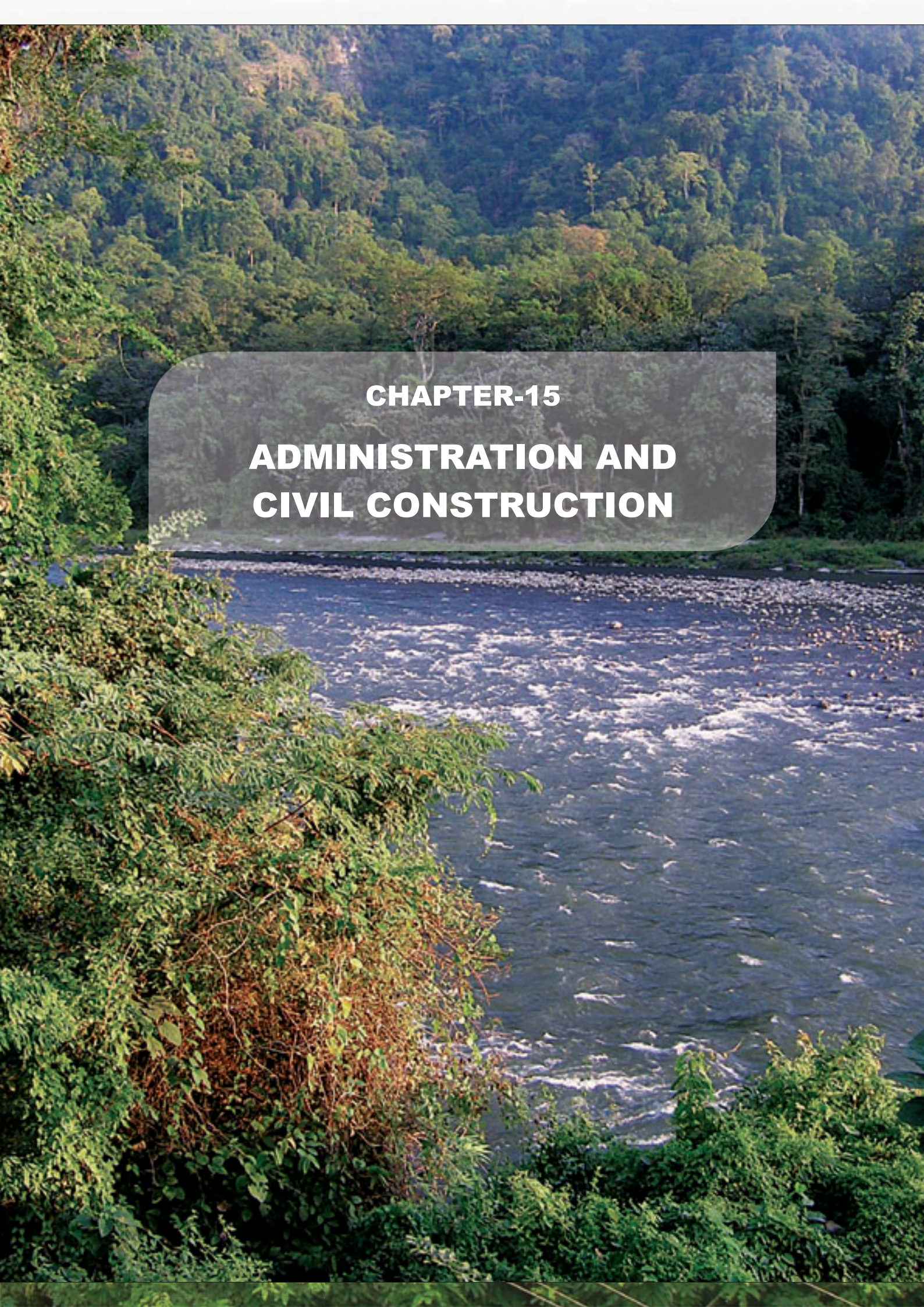
S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
5.	Capacity Development for Forest Management and Training of Personnel	Central Sector Project	225	JICA	To improve training environment for frontline staff through the rehabilitation of States 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) Forests Training Institutes and through capacity building of frontline forestry staff putting emphasis on Joint Forests Management (JFM), thereby strengthening human resource Development for sustainable forest Management.	2008-09 to 2013-14 (5 years and 3 months)
6.	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 forest by promoting sustainable forests 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

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
7.	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 environment and alleviating poverty.	(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 Management (viii) Monitoring and Evaluation (ix) Phase-out works (x) Consulting Services (including price and physical cont.	2007-08 to 2014-15

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
9.	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
10.	Odisha Forestry Sector Development Project	Odisha	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 improving environment and alleviating poverty.	(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 ecotourism activities (v) Catering to commercial and industrial demands. (vi) Capacity building of the Forest Department.	2006-07 to 2012-13

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
11.	Karnataka Sustainable Forests Management & Bio-diversity Conservation Project.	Karnataka	745	JICA	To restore forest 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
12	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	2005-06 to 2012-13

S. No.	Name of the Project	Implementing Agency/ State	Cost (₹ in Crores)	Funding Agency	Project Objectives	Components	Project Period
13.	Integrated Natural Resources Management and Poverty Reduction Project in Haryana	Haryana	286	JICA	<p>A. To rehabilitate forest lands in an ecologically sustainable manner.</p> <p>B. To improve the quality of life of the villagers and adjoining forests</p>	<p>(viii) Improving the infrastructural facilities</p> <p>(ix) Administration</p> <p>(x) Monitoring and Evaluation</p> <p>(i) Soil and Water Conservation</p> <p>(ii) Plantation model and nursery development</p> <p>(iii) Poverty reduction and institution building</p> <p>(iv) Technical assistance</p> <p>(v) Supporting activities</p> <p>(vi) Administration Staff.</p>	2004-05 to 2010-11
14.	Assam Project on Forest and Bio-diversity Conservation.	Assam	390	AFD	<p>(I) restoring forest ecosystem, in collaboration with the forest dependent communities.</p> <p>(II) enhancing the forest dependent communities' livelihood, and</p> <p>(III) ensuring conservation and sustainable use of biodiversity. In order to achieve this, the project is organized around four main technical components and one component for project management.</p>	<p>(i) Institutional Strengthening</p> <p>(ii) Multi-level Strategic Planning</p> <p>(iii) Sustainable forest Management</p> <p>(iv) Adding value and opening markets/ opportunities for forests and biodiversity goods and services.</p>	2012-13 to 2016-17



CHAPTER-15
ADMINISTRATION AND
CIVIL CONSTRUCTION

Personnel Administration

Staff Position

The details regarding various categories of posts in the Ministry of Environment and Forests is given in Table-70.

Table-70. Number of employees in various groups and with reservation positions

Group of Post	Sanctioned Strength	Number in Position	Scheduled Caste	Scheduled Tribes	OBCs	Physically
A	191	175	19	7	8	2
B	285	214	25	5	10	4
C	392	262	87	14	14	0
Total	868	651	131	26	32	6

The Ministry has outsourced some clerical/ office support jobs to tide over the shortage of the staff during the year.

Following the re-organization of the scientific Departments/Ministries during 1986 and the consequent upon de-linking of the Group 'A' scientific posts from the purview of the Union Public Service Commission (UPSC) and introduction of Flexible Complementing Scheme (FCS), P.III Section was specifically conceived and created in the Ministry to function as a separate, distinct, centralized and confidential unit for the purpose for recruitment (through Direct Recruitment/ Deputation) as well as promotion under FCS (Flexible Complementing Scheme) in the Group 'A' Scientific posts of the Ministry (proper), its Regional Offices and all the Attached/ Subordinate Offices having such posts.

Promotion

Two Research Officers (Grade-I) were promoted to the post of Scientist 'B' in the Ministry (Proper).

Extension of services of Scientists beyond superannuation

Two Scientists of this Ministry were granted extension of services beyond superannuation.

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 1st January, 2013 is 3109 (three thousand one hundred nine) which includes 2167 Direct Recruits and 942 Promotion posts. The Total Senior Duty Posts (SDP) in the Indian Forest Service are 1906 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 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 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 besides, vacancy circulars, training programme circulars, Rules and Regulations concerning IFS, Annual Confidential Report (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.
- Seventy one Direct Recruit Officers on the basis of IFS Examination, 2010 were included into the Service in different State Cadre.
- Seventy eight IFS Probationers of 2011 Examination undergoing Mandatory training at IGNFA, Dehradun.
- Thirty four State Forest Service officers were included into the Indian Forest Service under IFS (Appointment by Promotion) Regulations, during the year 2011.
- About 36 IFS officers joined at various levels under the Central Staffing Scheme of the Ministry and about 20 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 Indian Forest Service are pending in various Tribunals/Courts all over the Country.
- For the first time, online system for filling up of the deputation posts under CSS was introduced.

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- 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, its attached and subordinate offices including autonomous organizations/Public Sector Undertakings (PSUs) and IFS officers posted in the State Governments. It 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 and maintenance of Annual Immovable Property Returns (APRs) placing the APRs in public domain i.e. on the website of the Ministry.

Cases filed in Supreme Court, High Courts, different Benches of Central Administrative Tribunal and other Courts relating to the disciplinary matters are also dealt with by Vigilance Division. The prosecution cases launched against IFS Officers by 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 (CVC), Union Public Service

Commission (UPSC), Central Bureau of Investigation (CBI) and Department of Personnel & Training (DOPT) as per rules/procedure laid down on the matter.

During the year 2012-13, 5 disciplinary proceedings cases, 10 appeal cases and 6 prosecution cases were dealt with in the Vigilance Division. Court cases were pursued in the respective court/Central Administrative Tribunal (CAT) Bench and counter replies were filed in about eight cases. 28 complaints were received of which 5 were finally disposed of after obtaining and considering the investigation reports. 65 numbers of applications/appeals were received under RTI Act and replies sent in all the matters. The progress on the disposal of DP, Appeal, Prosecution, Court cases and RTI cases as well as complaints is reviewed by Joint Secretary & CVO, from time to time.

About 2330 Annual Property Returns for the year 2011 (as on 01.01.2012) were received from Group 'A' & 'B' officers of the Ministry as well as autonomous/subordinate/statutory organisations under it. Whereas the APRs of Indian Administrative Service (IAS) and Central Secretariat Service (CSS) officers were sent to DOPT, the APRs of IFS officers were placed in public domain on the website of the Ministry. This Ministry in consultation with NIC has developed software in order to enable IFS officers to file their APR on-line.

Detailed action plan for mitigation of potential areas of corruption relating to forest clearance and environmental clearances has been prepared in consultation with concerned Divisions and it has been uploaded on the Ministry's website.

Vigilance Awareness Week was observed in the Ministry during the period from 29th October to 3rd November, 2012 and a pledge was

administered by the Special 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 2012-13, a total number of 965 Parliament Questions pertaining to various aspects of environment were answered by the Ministry (583 questions in the Lok Sabha, out of which 47 were starred and 536 were un-starred. A total of 382 questions were asked in the Rajya Sabha, out of which 50 were starred and 332 were un-starred). The questions covered a wide range of issues with which the Ministry is concerned, prominent among them being questions related to Pollution, Forest Conservation, Wildlife Management, EIA, Freshwater and Marine Conservation, Environmental Conservation, Environmental Education, NGOs and Media, Climate Change and Meteorology, Energy Studies & Health and Sanitation etc.

The ENVIS Centre at WWF-India, under ENVIS scheme of the Ministry compiles the above mentioned Parliament Questions as replied by MoEF and other Ministries pertaining to various environmental issues. Graphical representation of the Parliament Questions replied by the Ministry during 2012-13 both in Lok Sabha and Rajya Sabha in various Sessions are given in Fig-64 and Fig-65.

	Budget	Monsoon	Winter	Grand Total
Starred	21	8	18	47
	221	127	188	536
Total	242	135	206	583

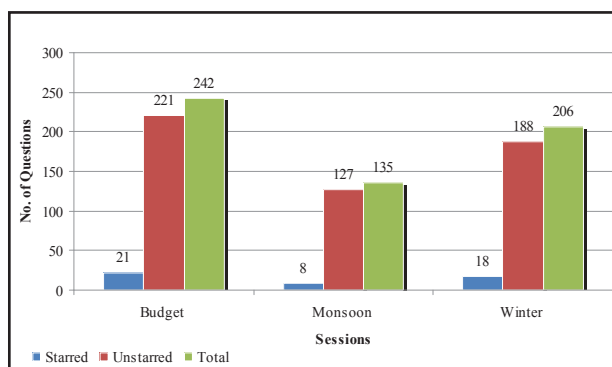


Fig-64. Number of questions replied by the Ministry in all sessions of Lok Sabha during 2012-2013

	Budget	Monsoon	Winter	Grand Total
Starred	17	15	18	50
	166	82	84	332
Total	183	97	102	382

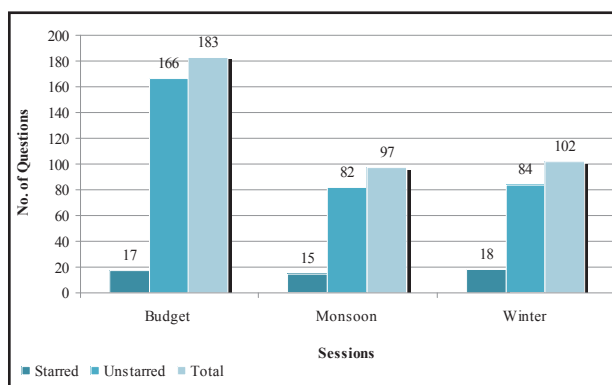


Fig-65. Number of questions replied by the Ministry in all sessions of Rajya Sabha during 2012-13

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 questions in Lok Sabha and Rajya Sabha sums up at 1075 and 615 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 be attributed to more than one subject sub-head. Statistical representation 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 2012-13 is given in Table-71 and Table-72.

Table-71. Subject-wise depiction of questions replied by the Ministry in Lok Sabha during 2012-2013

Subjects	Budget	Monsoon	Winter	Grand Total
Agriculture	7	7	12	26
Alternative Technologies	0	4	1	5
Biosafety	2	2	3	7
Climate Change and Meteorology	26	7	13	46
Disaster Management	6	3	5	14
Energy Studies	3	3	6	12
Environment and Forest Trade	18	6	9	33
Environmental Conservation	35	14	38	87
Environmental Education, NGOs and Media	37	13	11	61
EIA	61	20	30	111
Forest Conservation	78	37	43	158
Freshwater and Marine Conservation	50	24	34	108
Health and Sanitation	17	5	8	30
Medicinal Plants	1	2	1	4
Pollution	96	39	68	203
Water Management	14	5	9	28
Wildlife Management	63	40	39	142
Total	514	231	330	1075

Table-72. Subject-wise depiction of questions replied by the Ministry in Rajya Sabha during 2012-2013

Subjects	Budget	Monsoon	Winter	Grand Total
Agriculture	14	1	3	18
Alternative Technologies	4	0	1	5
Biosafety	7	0	2	9
Climate Change and Meteorology	15	7	5	27
Disaster Management	3	1	1	5
Energy Studies	36	2	2	40
Environment and Forest Trade	14	7	0	21
Environmental Conservation	13	12	11	36
Environmental Education, NGOs and Media	14	8	11	33
EIA	16	10	11	37
Forest Conservation	55	44	10	109
Freshwater and Marine Conservation	26	13	17	56
Health and Sanitation	11	4	3	18
Medicinal Plants	0	0	1	1
Pollution	46	29	25	100
Water Management	10	2	4	16
Wildlife Management	38	28	18	84
Total	322	168	125	615

The centre is currently working on the compendium of Environment in the Indian Parliament: An Analysis 2012 in collaboration with 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.wwfenvnis.nic.in>.

During the year 2012-13, the Consultative Committee of Members of Parliament attached to the Ministry held one meeting related to Tigers and Tiger Conservation. The meetings of the Department related Parliamentary Standing Committee of Science and Technology, Environment and Forests of the Members of the Parliament were held four times and deliberated over the demand for grants of 2012-13 and other issues. Three meetings were also held with the Committee on Government Assurances on pending Assurances of the Ministry.

Results-Framework Document (RFD), 2011-12

Introduction

The Prime Minister approved the outline of a "Performance Monitoring and Evaluation System (PMES) for Government Departments" vide PMOI.D.No.1331721/PMO/2009-Pol dated 11.09.2009. Under PMES, each department is required to prepare a Results-Framework Document (RFD).

A RFD provides a summary of the most important results that a department/Ministry expects to achieve during the financial year. This document has two main purposes: (a) move the focus of the department from process-orientation to results-orientation,

and (b) provide an objective and fair basis to evaluate department's overall performance at the end of the year.

The RFD seeks to address three basic questions: (a) What are department's main objectives for the year (b) What actions are proposed to achieve these objectives (c) How would someone know at the end of the year the degree of progress made in implementing these actions i.e., what are the relevant success indicators and their targets.

Vision, Mission, Objectives and Functions of the Ministry as per RFD

Vision:

Conservation of environment and natural resources for the present and future generations in a manner consistent with the aspirations of the country for growth and development.

Mission:

To plan, promote, coordinate and oversee the implementation of environmental and forestry programmes in order to protect the environment and maintain a balance between conservation and development activities

Objectives:

- Increase the forest and tree cover to 33% of the geographical area of the country (*Afforestation and regeneration of degraded Forests*)
- Conservation of the existing forests, wildlife and water resources and survey of various areas for identification of new species (Protection of Forests, Conservation of rivers, Biodiversity Conservation, Conservation of Wetlands, Wildlife Conservation, Conservation of resources in the eco-sensitive zone, Capacity building, training and research in classical and molecular taxonomy)

- Control of Pollution (Air, Water, Noise and Industrial pollution)
(Better ambient water quality, Management of hazardous substances and Better Environmental governance)

Functions:

The major functions of the Ministry include:

- Formulation of national policies on management of environment, forests and wildlife;
- Implementation of provisions of related legislations on forests, environment and wildlife, control of pollution of air and water, etc.; and
- Survey and exploration of natural resources particularly of forests, flora, fauna, ecosystems, etc.
- Bio-diversity conservation including that of lakes and wetlands;
- Conservation, development, management and abatement of pollution of rivers which includes National River Conservation Directorate;
- Environmental research and development, education, training, information and awareness;
- Regulation of diversion of forest land for non forestry purposes;
- Environmental Impact Assessment;
- Wildlife conservation, preservation, protection planning, research, education, training and awareness;
- Afforestation and eco-development;
- Prevention of cruelty to animals;
- Administration and Management of subordinate and autonomous institutions of the Ministry; and

- Monitoring of implementation of central sector and centrally sponsored schemes funded by the Ministry.

Performance Evaluation Report of RFD, 2011-12

The Performance Evaluation Report of RFD of the Ministry for 2011-12 is at Annexure-X. The Ministry achieved a composite score of 82.86 for the year 2011-12 which implies that most of the targets were largely achieved in 2011-12.

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 2012-13

- The IT infrastructure of the Ministry and Zoological Survey of India was strengthened.
- Unicode based bilingual software has been installed at Botanical Survey of India and Zoological Survey of India for bilingualisation of all computer systems.
- Strengthened IT infrastructure for implementation of e-payment system at Pay and Accounts Office (PAO) in the Ministry.
- Developed a software module for updation, dissemination and online submission of Annual Property Returns (APR) of Indian Forest Service (IFS) Officers.

- Enhanced the IT Infrastructure of Indian Institute of Forest Management (IIFM), Bhopal for implementation of ERP Solutions.
- Digitised and updated Annual Property Returns (APR) of Indian Forest Service (IFS) Officers on the website of the Ministry for the year 2011-12.

RTI Cell

- The Ministry received 1,789 applications and 156 appeals under RTI Act, 2005 during the year 2012-13 (upto 26th February, 2013) 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 as and when there is change in allocation of work among CPIOs/AAs. All the subordinate offices/Institutions/Autonomous bodies have been requested to periodically revise the Notification for CPIOs/AAs.
- A training programme for training of CPIOs in RTI MIS System was organized in September 2012, in collaboration with DoP&T and NIC.
- Directions from the Central Information Commission (CIC) and DoPT, relevant to this Ministry are being circulated to the CPIO/AAs for better understanding and implementation of RTI Act.
- Periodical reports being sent regularly to DoPT and Central Information Commission.

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 (US) and above officers of this Ministry,
- 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, India Tourism Development Corporation (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 806 Air tickets for domestic & International Sectors and arranged visas & visa notes for around 150 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. One of the major initiatives/activities of the Division during the year 2012-2013 is the construction of Ministry's own office building at Aliganj, Jorbagh Road, New Delhi through CPWD which is nearing completion. The GA Division is working in tandem with Central Public Works Department (CPWD) and various other agencies involved in the project to complete the building by the middle of 2013. The building is being constructed to conform to the stringent green building parameters of Five Star GRIHA Rating of Ministry of New and Renewable Energy and LEED Platinum Rating of Indian Green Building Council. The building also incorporates various innovative systems like :

- Geothermal heat exchange for water cooling towers
- Chilled beam system for HVAC
- High efficiency terrace mounted solar panels to meet its total energy demand
- Automated car parking to optimise space utilisation
- Low energy EM technology for bio digestion of organic waste
- Regenerative lifts
- Solar passive design to minimise indoor heat ingress and maximise natural light

Public Grievance Cell

A Public Grievance Cell has been functioning in the Ministry to attend to the complaints of public regarding forestry, environmental matters etc. Shri Anil Sant, Joint Secretary (PG) has been nominated as Public Grievance Officer of the Ministry. Further, Under Secretary P.III has been given charge of Assistant Public Grievance Officer.

The particulars of the Public Grievance Officer of this Ministry are as under:

Shri Anil Sant

Joint Secretary (PG)
R.No. 417(4th Floor),
Paryavaran Bhawan,
C.G.O. Complex, Lodhi Road,
New Delhi-110003

The PG Cell receives grievance in two modes namely through cpgrams portal of Department of Administrative Reform and Public Grievances (DARPG) and directly by post. The grievances received online through portal are directly sent online to the various sections/divisions for disposal and the grievances received through post are sent to 'the various sections/ divisions of this Ministry for redressal through OAK.

The staff of various Divisions/Sections who are dealing with Public Grievances, have been trained by holding one-day video conferencing at Paryavaran Bhavan with the assistance of DARPG officials 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. On many a times the concerned dealing hands of the divisions/sections concerned of this Ministry have been deputed for training from time to time organized by DARPG to get to know the operationalisation of cpgrams.

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 neighborhood:
- 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.
- During the year, eighty four grievances were received from the general public and staff.

As on date, there are a total of 2103 public grievances out of which 1084 have been disposed off and 1014 grievances remain pending. The disposal rate is 52%. Efforts are being made by the PG cell to raise the disposal rate to about 70-75% in the year 2013-14 by issuing the concerned divisions/sections periodical reminders.

Implementation of Official Language Policy

Introduction

Sustained efforts were made to ensure proper compliance of the Official Language Policy of the Union 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 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.

Inspections

High Powered Committee of Parliament on Official Language inspected our Attached/Subordinate Offices namely Forests Research

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Fig-66. A view of Leh Ladakh

Institute, Dehradun and Zoological Survey of India, Jodhpur. In addition to these inspections, six Attached/Subordinate Offices were also inspected by Joint Secretary/Officer(s) of Official Language Division with a view to review the position of implementing Official Language Policy of the Union.

Hindi Fortnight

Hindi Fortnight was organised from 14th to 28th September, 2012 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)

Civil Construction Unit (CCU), headed by Chief Engineer (Civil), was set up in the Ministry of Environment & Forests in August 1987 for taking up important works of the Ministry on priority basis, in pursuance of the Government of India decision that major scientific departments with a substantial annual civil works budget should have a Civil Construction Unit. The technical posts of CCU are manned by officers drawn from Central Public Works Department (CPWD).

The works being taken up by CCU consist of construction of office-cum- laboratory buildings, herbariums, national museums of natural history, staff quarters and other

Table-73. Budget allocation and progress of expenditure during 2012-13

(₹ in lakhs)

(Name of the Object Head)	B.E. 2012-13	Re-appropriation 2012-13	Expenditure upto previous month	Expenditure during the month from 01/11/2012 to 30/11/2012	Total expenditure up to 30/11/2012	Percentage of Column No. 3
A. CAPITAL OUTLAY ON FORESTRY & WILDLIFE						
MAJOR HEAD "4406" (PLAN)						
1. RO	50.00	50.00	0.00	0.00	0.00	0.00
2. NZP	500.00	500.00	143.46	4.37	147.83	29.57
Total (A) Major Head "4406"	550.00	550.00	143.46	4.37	147.83	26.88
B. CAPITAL OUTLAY ON ECOLOGY & ENVIRONMENT						
MAJOR HEAD "5425" (PLAN)						
1. BSI	150.00	150.00	1.01	0.13	1.14	0.76
2. BGIR	150.00	150.00	65.67	1.09	66.75	44.50
3. ZSI	200.00	200.00	143.85	15.88	159.73	79.87
4. NMNH	500.00	900.00	384.24	44.57	428.81	47.65
5. New MoEF Building at Aliganj.	3913.00	3513.00	1801.26	2.71	1803.97	51.35
Total (B) Major Head "5425"	4913.00	4913.00	2396.03	64.38	2460.41	50.08
Total (A+B) Capital Plan	5463.00	5463.00	2539.49	68.75	2608.24	47.74
(C). (NON PLAN) CIVIL ENGINEERING WING	441.60	441.60	313.96	37.50	351.45	79.59

building works relating to various units of the Ministry of Environment & Forests viz. Botanical Survey of India, Zoological Survey of India, National Museum of Natural History, State Forest Service Colleges, Indira Gandhi National Forest Academy, Forest Survey of India, National Zoological Park, New Delhi and Regional Offices of Ministry located in different part of the Country.

Besides above, construction of offices, staff quarters and herbariums, etc. in respect of autonomous institutes viz. Indian Council of Forestry Research & Education (ICFRE), G.B. Pant Institute of Himalayan Environment

& Development, Indian Institute of Forest Management, Indian Plywood Industries Research and Training Institute, Institute of Wood Science and Technology, Central Zoo Authority are also executed by CCU. The CCU has three field divisions with sub-divisions at Delhi, Dehradun, Almora, Sawai Madhopur, Bangalore, Bhopal, Coimbatore and Hyderabad for execution of various works. Works in eastern, north-eastern and western regions of the country have been entrusted to CPWD. Thus over 70 % of the work of the Ministry and its autonomous bodies is being handled by CCU.

In order to avoid use of wood in the buildings constructed by CCU a number of alternatives have been adopted. For doors, windows and cupboards mostly steel sections, pressed steel frames, aluminium sections are being used depending on importance of the buildings.

Similarly, solar energy is being used in selected areas. Solar water heating system for heating water has also been introduced by CCU in the hostel buildings. To affect savings in energy, Compact Fluorescent Lamps (CFLs) are being used in place of conventional fluorescent lights in houses and guest houses. Important buildings are also being designed on solar passive architecture.

CHAPTER-16
PLAN COORDINATION
AND BUDGET



Plan Coordination Division

Introduction

Plan Coordination Division is responsible for coordination of all Plan Schemes and Programmes of the Ministry of Environment & Forests, and works in close association with Planning Commission and Ministry of Finance (Department of Economic Affairs' Budget Division and Department of Expenditure). Its work involves preparation, monitoring and review of the Ministry's Five Year Plans, Annual Plans and Annual Action Plans and the Outcome Budget of the Ministry. The Division also looks after monitoring of progress reports and reports under the 20-Point Programme (Point XV item Nos. 52 & 53).

Activities undertaken during year 2012-13

The progress of the programmatic variegated Centrally Sponsored Schemes (CSS) and Central Sector (CS) Schemes is 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 Environment and Forestry and Wildlife sectors as well as implementing agencies.

During 2012-13, the Ministry has rationalised eight CSS of the Eleventh Five Year Plan (2007-2012) to five in the Twelfth Five Year Plan (2012-17) by suitable merger/clubbing, thereby reducing the total number of thematic/ umbrella schemes from 22 to 18, comprising of five CSS and 13 CS Schemes, including one on Climate Change which has been approved by the Planning Commission. The details are given in Table-74. Amongst sub-Schemes, the Schemes of Industrial Pollution Abatement through Preventive Strategies and Clean Technologies have been merged into a

single scheme under the thematic scheme of Pollution Abatement. Similarly, the schemes of National Lake Conservation Plan (NLCP) and Wetlands have been merged into a single scheme on "National Plan for Conservation of Aquatic Eco-Systems" (NPCA) under the thematic scheme of "Conservation of Natural Resources & Eco Systems". The Scheme of Taj Protection has also been clubbed under this thematic Scheme. Under the thematic Scheme of International Cooperation Activities, a new sub-Scheme on Desertification Cell has been added. The Civil Construction Unit Scheme is a non-Plan Scheme and has been shown to account for Plan expenditure on construction of New Building of the Ministry (Indira Paryavaran Bhavan), which is likely to be completed by June 2013.

New Initiatives in the Twelfth Plan include:

- Recasting the Scheme of Common Effluent Treatment Plant (CETPs)
- Enhancement of Sewage Treatment Capacity
- National Plan for Conservation of Aquatic Eco Systems (NPCA)
- National Environmental Monitoring Programme
- National Forestry Information System
- Invasive Species Management
- Coastal and Marine Conservation
- Valuation of Ecosystem Services and Biodiversity
- Environmental Performance Index
- Rangeland and Silvi Pasture Development Scheme
- Satellite-based Forest Resource Assessment
- Green India Mission.

Table-74. Rationalization of Centrally Sponsored Schemes in the Twelfth Plan

Existing Composition of CSS XI Plan	Restructured composition XII Plan
1. National River Conservation Plan <ul style="list-style-type: none"> • National River Conservation Directorate (NRCD) • National River Conservation Plan (NRCP) • National Ganga River Basin Authority (NGRBA) 	1. National River Conservation Plan <ul style="list-style-type: none"> • NRCD • NRCP • NGRBA
2. Conservation of Natural Resources and Eco-Systems <ul style="list-style-type: none"> • Conservation of Wetlands, Mangroves, Coral • NLCP • Biosphere Reserves • Biodiversity Conservation and Rural Livelihood Improvement Project (BCRLIP) 	2. Conservation of Natural Resources and Eco-Systems <ul style="list-style-type: none"> • National Plan for Conservation of Aquatic Eco-Systems (incl. NLCP and Wetlands) • Conservation of Mangroves, Coral • Biosphere Reserves • BCRLIP • Environmental Management in Heritage & Tourist Centres incl. Taj Protection
3. Environmental Management in heritage & Tourist Centres, incl. Taj Protection	Clubbed with Scheme No. 2
4. National Afforestation Programme	3. Afforestation & Forest Management <ul style="list-style-type: none"> • National Afforestation Programme • Green India Mission • Intensification of Forest Management Scheme
5. Intensification of Forest Management Scheme	Clubbed with Scheme No. 3
6. Integrated Development of Wildlife Habitats	4. Wildlife Management <ul style="list-style-type: none"> • Integrated Development of Wildlife Habitats • Project Elephant
7. Project Elephant	
8. Project Tiger	5. Project Tiger

Eleventh Five Year Plan (2007-2012)

Ministry of Environment & Forests had an approved outlay of ₹ 10,000 crore for the Eleventh Five Year Plan, 2007-12. Within the Five Year Plan, the approved outlays and expenditure incurred in each of the five Annual Plans have been given sector-wise in Table-75. As may be seen, Annual Plan 2007-08 had an approved outlay of ₹ 1,351.00 crore against which the actual utilization amounted to ₹ 1,349.73 crore. In 2008-09, it was allocated an outlay of ₹ 1,500.00 crore, against which the actual utilization amounted to ₹ 1,483.02 crore.

Annual Plan 2009-10 had an approved outlay of ₹ 1,880.00 crore, reduced at RE stage to ₹ 1,650.00 crore under economy instructions, against which the actual utilization amounted to ₹ 1,630.69 crore. Annual Plan 2010-11 had an approved outlay of ₹ 2,200.00 crore, against which the actual utilization amounted to ₹ 2,181.58 crore. In the last year of the Eleventh Plan, the Annual Plan 2011-12 had an approved outlay of ₹ 2,300.00 crore, against which the actual expenditure was ₹ 1825.44 crore.

Table-75. Sector-wise Summary of Eleventh Plan Outlays/ Actual Expenditure

(₹ crore)

Sector	Environment	NRCD#	Forests & Wildlife	NAEB@	Animal Welfare	Total
Period						
XI Plan Approved Outlay	1,246.01	2,540.00	2,943.99	3,150.00	120.00	10,000.00
2007-08						
Outlay	259.16	340.00	371.61	359.23	21.00	1351.00
Expenditure	224.22	320.94	361.73	422.05	20.79	1349.73
2008-09						
Outlay	261.38	340.00	475.00	398.62	25.00	1,500.00
Expenditure	240.42	326.12	520.87	370.71	24.90	1,483.02
2009-10						
Outlay	291.42	577.33	599.63	386.62	25.00	1,880.00*
Expenditure	253.03	426.69	572.00	354.97	24.00	1,630.69
2010-11						
Outlay	480.17	751.71	592.12	352.00	24.00	2,200.00
Expenditure	465.87	755.02	582.92	353.93	23.84	2,181.58
2011-12						
Outlay	621.21	751.71	573.08	330.00	24.00	2,300.00
Expenditure	465.42	421.94	579.84	334.92	23.32	1,825.44
Total [2007-12]						
Actual Outlay	1,913.34	2,760.75	2,611.44	1,826.47	119.00	9,231.00
Expenditure	1,648.72	2,250.71	2,617.36	1,836.58	116.85	8,470.46

Includes Schemes of National River Conservation Plan (NRCP) and National Plan for Conservation of Aquatic Eco Systems (NPCA).

@ Includes Schemes of National Afforestation & Eco-Development Board (NAEB), National Afforestation Programme (NAP), and Green India Mission (GIM).

* Under Finance Ministry's economy instructions, RE 2009-10 was reduced to ₹ 1,650.00 crore.

Twelfth Five Year Plan (2012-2017)

The Twelfth Plan Document, approved by the National Development Council (NDC) on 27th December 2012, has the basic theme of "Faster, Sustainable, and more Inclusive Growth", and lays out major targets, key challenges to meet them, and the broad strategy that may be followed to achieve the stated objectives. Ministry of Environment & Forests has been allocated an outlay of ₹ 17,874 crore, which works out to 0.41% of the Plan allocation across various Ministries/ Departments as against an actual expenditure of ₹ 847 crore in the Eleventh Plan. At current prices, the enhancement in this Ministry's Twelfth Plan outlay over the Eleventh Plan outlay, however, works out to 109%.

Twelfth Plan has identified **13 Monitorable Socio-Economic targets** for this Ministry, which have been taken up for regular monitoring of progress made by the Ministry. These targets are as follows:

– Environment and Climate Change

- Assess and remediate 12 identified contaminated sites (hazardous chemicals and wastes) with potential for ground water contamination by 2017.
- Clean 80 per cent of critically polluted stretches in rivers by 2017 and 100 per cent by 2020.
- States to meet National Ambient Air Quality Standards (NAAQS) in urban areas by 2017.
- To reduce emission intensity of Gross Domestic Product (GDP) in line with the target of 20 to 25 per cent reduction over 2005 levels by 2020.

– Forests and Livelihood

- Greening 5 million ha under GIM including 1.5 m.ha. of degraded lands,

afforestation and eco-restoration of 0.9 m.ha. of ecologically sensitive areas.

- Technology-based monitoring of forest cover, biodiversity and growing stock including change-monitoring on periodical basis through dedicated satellite by 2017 and establishment of open web-based National Forestry & Environmental Information system for research and public accessibility by 2015.
 - Engagement of Village Green Guards/ Community Foresters for every Joint Forest Management (JFM) village by 2016.
 - Establish forestry seed bank in forest circles and Model Nursery in every district with information on public portal by 2014.
- ### – Wildlife, Ecotourism and Animal Welfare
- Twenty per cent of veterinary professionals in the country will be trained in treating wildlife.
 - Integrated Ecotourism District Plans covering 10 per cent of all potential Protected Areas (PAs) by 2017.
 - Promoting participation of private sector, civil societies, NGOs and philanthropists in animal welfare.
- ### – Ecosystem and Biodiversity
- Restore 0.1 mha. of wetlands/ inland lakes/ water bodies by 2017.
 - Mapping and preparation of biodiversity management plans for deserts (both cold and arid), coastal areas, important coral zones, wetlands, mangroves and so on to be completed by 2017.

Besides, **14 Goals** have also been identified

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in the Plan Document, which would receive focus and special attention, *inter alia*, through the Annual Plans of the Ministry. These 14 Goals are set out below:

– **Environment**

- Epidemiological studies to assess improvement in health status due to better management of environment and ecology.
- Promotion and adoption of cleaner technology, strengthening and initiation of reforms in regulations, policy making and enforcement institutions for environmental governance.
- Move towards cumulative and strategic Environmental Impact Assessment (EIA).
- Ensure ecological flows in all rivers by regulating abstractions so as to allow conservation of riverine ecosystems through developing a legal framework and management strategy for conservation of river basins.
- Promotion of recycling and reuse of treated sewage in urban projects such as sanitation, landscaping, central air conditioning and so on.

– **Forests and Livelihood**

- Improve forest productivity, production and sustainable management of biodiversity (equity in access to benefit sharing with local people).
- Restore and intensify forest-rangelands/ grazing-land management and establish community grazing land around forest fringe villages.
- Build capacity of Village Forest Committees/ Joint Forest Management Committees (JFMCs) for management

of forest resources including ecotourism.

- Revive seed orchards and silviculture plots for various forest types of the country, as well as for enlisted species under Minor Forest Produce (MFP)/ Non Timber Forest Produce (NTFP), including genetic improvement, and establishment, of clonal orchards.

– **Wildlife, Ecotourism and Animal Welfare**

- Reducing and managing human-wildlife conflict.
- Commercialisation of permissible marine products rich in poly unsaturated fatty acids (PUFAs), vitamins and so on.
- Promotion of ecotourism and participatory eco-development support livelihood of local population.

– **Ecosystem and Biodiversity**

- Develop national targets and indicators related to biodiversity and support actions to strengthen implementation of Biological Diversity Act, 2002 and ensure bio-safety for economic and social development of local communities.
- Assess coastal biodiversity resources, ensure sustainable management, restoration of mangroves, coral reefs and wetlands and support livelihood.

Annual Plan 2012-13 and Annual Plan 2013-14

In the current financial year (2012-13), the first year of the Twelfth Five Year Plan, the Ministry has been allocated an outlay of ₹ 2,430.00 crore which has subsequently been

Table-76. Sector-wise Summary of Twelfth Plan Outlays/ Actual Expenditure
(as on 31st December 2012)

(₹ crore)

Sector	Environment	NRCD#	Forests & Wildlife	NAEB@	Animal Welfare	Total
Period						
XII Plan Approved Outlay	3,802.00	4,273.00	4,818.80	4,780.00	200.20	17,874.00
2012-13						
Outlay (BE)	580.42	771.80	606.09	446.49	25.20	2,430.00
Outlay (RE)	466.76	434.30	618.25	255.49	25.20	1,800.00
Expenditure	307.18	354.21	506.60	139.11	24.35	1,331.45
2013-14						
Outlay (BE)	614.37	619.80	719.14	451.49	25.20	2,430.00

reduced at RE stage to ₹ 1,800.00 crore. The Annual Plan outlay of the Ministry for 2013-14, the second year of this Plan, is ₹ 2430.00 crore. The sectoral summary of the two Annual Plans is given in Table-76.

Other current important activities during 2012-13

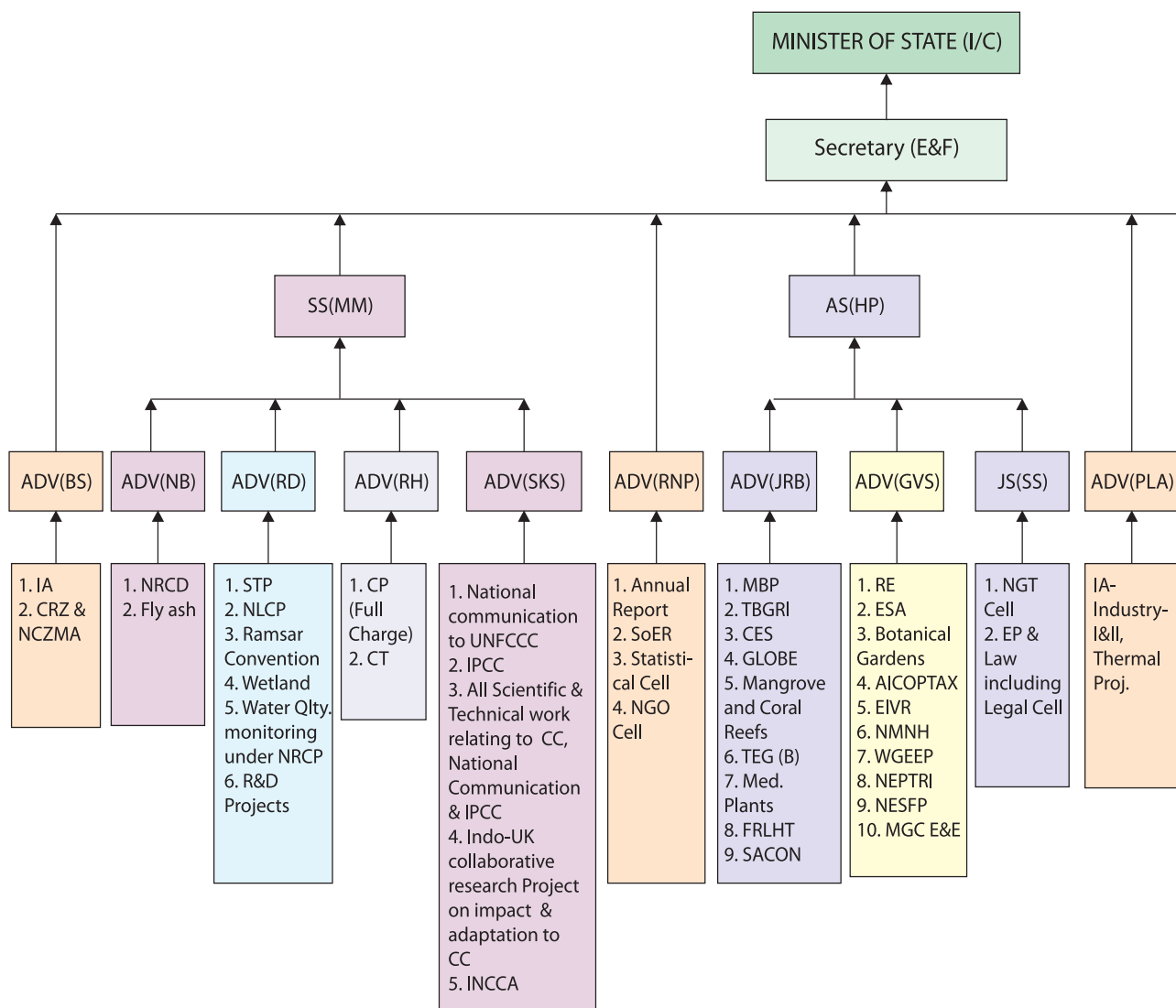
Preparation of the Annual Plan 2013-14 and Outcome Budget 2013-14 was also prepared in respect of all Demands/ Appropriations controlled by the Ministry. This includes regular monitoring of physical and financial progress of the Annual Outcome Budget for 2012-13 against the targets set out therein.

Matters relating to State Plans are also taken up. Issues with regard to Special Component

Plans, notably the Scheduled Caste Sub-Plan (SCSP), the Tribal Sub-Plan (TSP) and the North Eastern Region (NER) Plan are also taken up in consultation with the Planning Commission and Ministry of Finance. All other references on environmental planning and issues referred to by Planning Commission to this Ministry were handled in the Plan Coordination Division.

The Division also took up furnishing of the Half-Yearly Progress Report on Point No. 15 [*Paryavaran Sanrakshan evam Van Vridhi* (Environment Protection and Afforestation)] of Revised 20-Point Programme 2006 to M/o Statistics & Programme Implementation as well as any matters referred to it by the Parliamentary Standing Committee on Time and Cost Overruns of projects.

ORGANISATIONAL STRUCTURE OF (Divisions Under



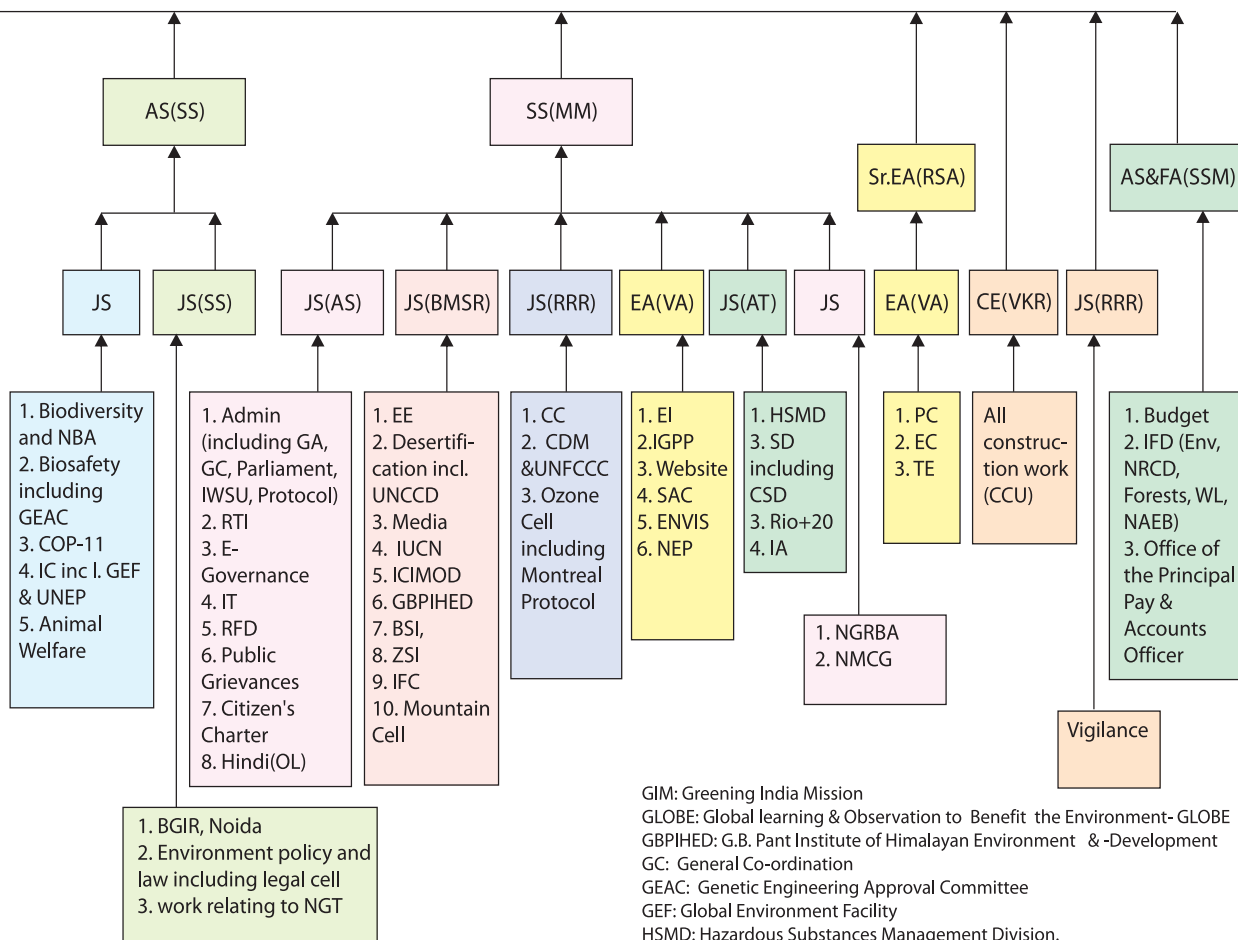
NLCP: National Lake Conservation Plan
 NMCG: National Mission on Clean Ganga.
 NRCD: National River Conservation Directorate
 OL: Official Language
 P&L: Policy and Law
 PG: Public Grievances
 PC: Plan Co-ordination
 RC: Rotterdam Convention.
 SACON: Salim Ali Centre for Ornithology & Natural History
 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 Nations Framework Convention on Climate Change
 VIG: Vigilance
 WGEEP: Western Ghat Ecology Expert Panel
 ZSI: Zoological Survey of India
 AW: Animal welfare

BGIR: Botanical 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
 CSD: Commission on Sustainable Development
 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

Annexure-1 A

MINISTRY OF ENVIRONMENT & FORESTS
Environment Sector)

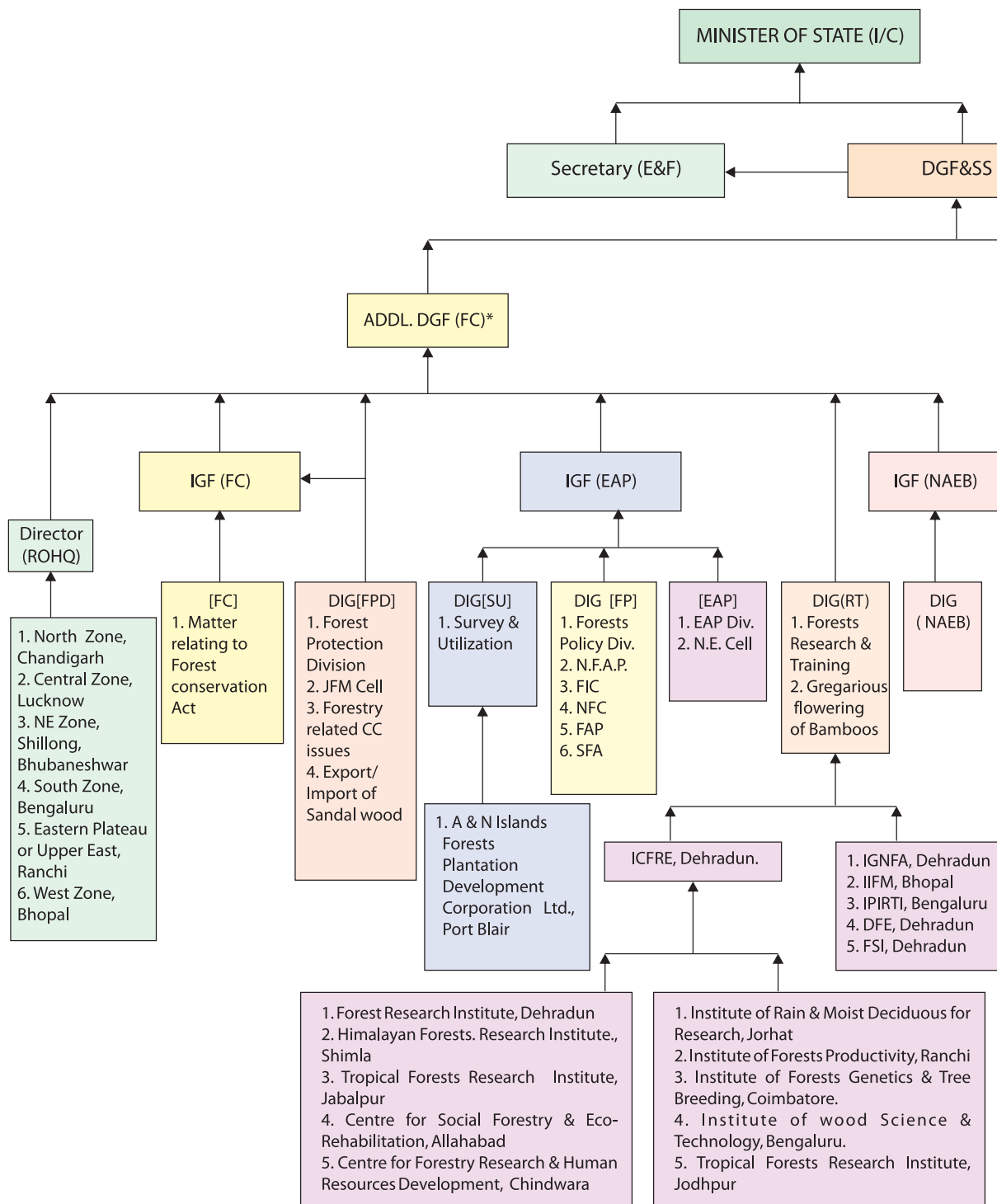
(As on 28 Feb, 2013)



- GIM: Greening India Mission
- GLOBE: Global learning & Observation to Benefit the Environment-GLOBE
- 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
- NBA: National Biodiversity Authority
- NCZMA: National Coastal Zone Management Authority
- NEP: New Environment Policy
- NEPTRI: National Environmental Protection Training and Research Institute
- NESPF: National Environmental Science Fellows Programme
- NGO: Non Governmental Organisation
- NGRBA: National Ganga River Basin Authority

- FE: Forest Establishment
- FRLHT: Foundation for Revitalization of Local Health Traditions
- GA: General Administration
- INCCA: Indian Network for Climate Change Assessment
- W&RC: Wetland and Ramsar Convention
- TBGR: Tropical Botanical Garden and Research Institute
- CES: Centre For Ecological Science
- OC & MP: Ozone Cell & Montreal Protocol
- RE: Research in Environment
- RTI: Right to Information
- RFD: Results Framework Document
- 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

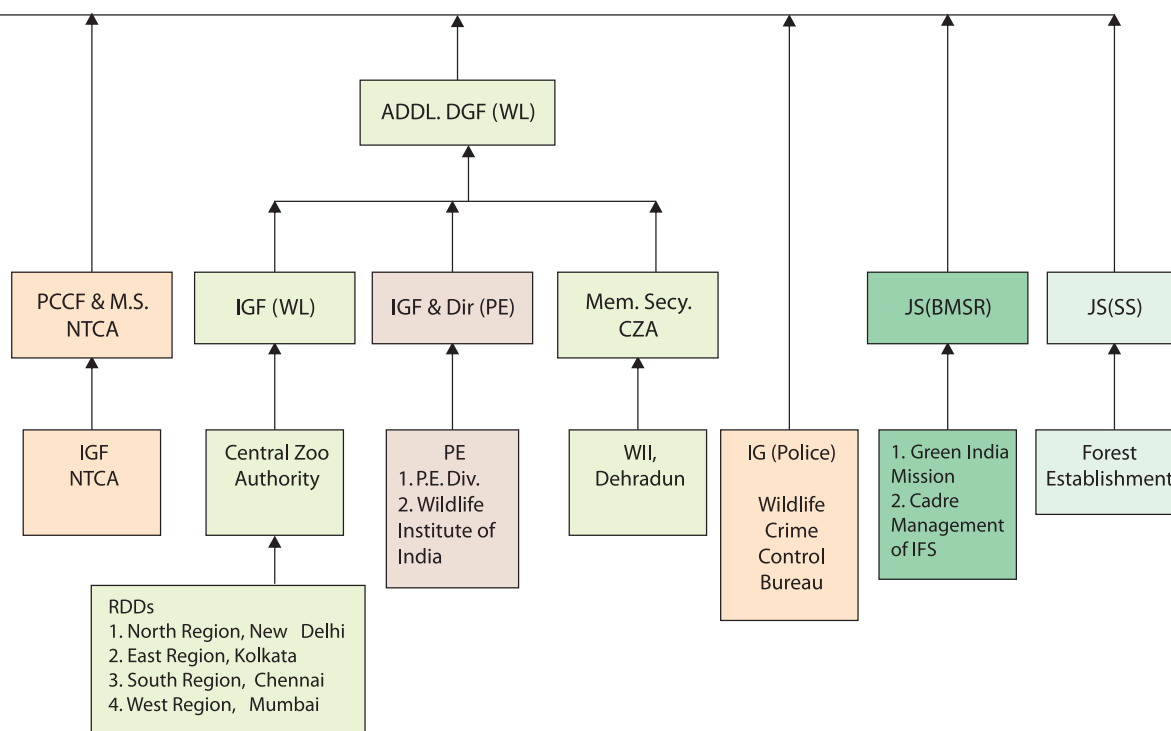
ORGANISATIONAL STRUCTURE OF (Divisions Under Forestry)



Annexure-1 B

**MINISTRY OF ENVIRONMENT & FORESTS
and Wildlife Sector)**

(As on 28 Feb, 2013)



* holding additional charge of DGF & SS

- FC: Forest Conservation
- FPD: Forest Protection Division
- SU: Survey & Utilizationm
- FP: Forest Policy
- RT: Research & Training
- JFM: Joint Forest Management
- NFAP: National Forestry Action Programme
- FIC: Forest International Cooperation
- NFC: National Forest Commission
- EAP: Externally Aided Projects
- NE: North Eastern
- NZP: National Zoological Park
- PT: Project Tigers

- PE: Project Elephants
- WL: Wildlife
- Ros: Regional Offices
- WHC: World Heritage Convention
- DFE: Directorate of Forests Education
- WII: Wildlife Institute of India
- FSI: Forest Survey of India
- IFNFA: 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 of Environment & Forests

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, 17th Main Road, 2nd Block, Koramangala, Bangalore-560034 (Karnataka) Email: roszef@yahoo.co.in	Ph. No. 080-25635901 Fax No. 080-25537184	Andhra Pradesh, Goa, Karnataka, Kerala, Lakshadweep, Puducherry and Tamil Nadu
2.	Shri J.K. Tewari, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (EZ), A/3, Chandersekharpur, Bhubaneswar-751023 Email: mef.or@nic.in	Ph. No. 0674-2301213 Fax No. 0674-2302432	Andaman & Nicobar Islands, Bihar, Jharkhand, Odisha and West Bengal
3.	Shri Lakhwinder Singh, IFS 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	Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Gujarat, , Madhya Pradesh and Maharashtra
4.	Shri A.K. Goyal, 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 http://nromoef.gov.in Email: nromoefchd@rediffmail.com	Ph No. 0172-2638135 Fax No. 0172-2638061	Chandigarh, Delhi Haryana, Himachal Pradesh, J&K and Punjab

S. No.	Regional Office	Phone and Fax Number	Jurisdiction of the Regional Offices
5.	Shri Azam Zaidi, IFS Additional Principal Chief Conservator of Forest (Central), Ministry of Environment and Forests, Regional Office (CZ), Kendriya Bhawan, 5th Floor, Sector "H", Aliganj, Lucknow-226020 http://moefrolko.org Email: m_env@rediffmail.com	Ph. No. 0522-2326696 Fax No. 0522-2324340	Rajasthan, Uttarakhand and Uttar Pradesh
6.	Shri, Anil Kumar, 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, Mizoram, Nagaland, Sikkim and Tripura

Regional Centres of National Afforestation and Eco-Development Board

S. No.	Name & Address of Regional Centre	State/UTs covered as per MOU
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 & Forests**

S. No.	Centres of Excellence	Contact Details
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: cpreec@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

S. No.	Centres of Excellence	Contact Details
2.	Gobind Ballabh Pant Institute of Himalayan Environment and Development, Kosi - Katarmal, Almora - 263 643, Uttarakhand	Tel : 05962-241015 Fax : 05962-241014 email: psdir@gbpied.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

S. No.	Centres of Excellence	Contact Details
8.	Institute of Forest Productivity Ranchi - 834 001, Jharkhand	Tel : (0651) 2948505, 2948515 email : dir_ifp@icfre.org
Centres		
9.	Centre for Social Forestry & Eco-rehabilitation Allahabad - 211 002, Uttar Pradesh	Tel : (0532) 2440795 email : head_csfre@icfre.org
10.	Centre for Forestry Research & Human Resource Development, Nagpur Road, Chhindwara-480001	Tel: (07162) 282444 Fax: (07162) 254473 email: head_cfrhrd@icfre.org
11.	Forest Research Centre Dulapally, Kakimpet (P.O.), Hyderabad-500014	Tel: 040-23194188 Fax: 040-23095926 email: head_frc@icfre.org
	Advanced Centre for Bamboo and Rattan Aizawl, Mizoram	Tel: 0389-2301159, 2301157 email : imtienla@icfre.org
c) Wildlife Wing		
1.	Wildlife Institute of India, P.B. No. 18, Chandrabani, Dehradun - 248 001, Uttarakhand	Tel: 0135-2640111-15 Fax: 0135-2640117 email : wii@wii.gov.in
2.	Central Zoo Authority Bikaner House, Annexe VI Shahjahan Road , New Delhi - 110011	Tel : 011-23381585 Fax : 011-23386012 email : cza@nic.in
Subordinate Offices		
a) Environment Wing		
1.	Botanical Survey of India CGO Complex, 3rd MSO Building, Block F, (5th & 6th floor) Sector 1, Salt Lake City, Kolkata – 700 064	Tel : 033-23346040/4963 Fax : 033-23215631, 23346040
2.	Zoological Survey of India Prani Vigyan Bhawan, M-Block, New Alipur, Kolkata - 700 053	Tel : (033) 24986820 Fax : (033) 24006893 email: venkyzsi50@yahoo.com
3.	National Museum of Natural History, FICCI Building, Barakhamba Road, New Delhi - 110 001	Tel : (011) 23314849 Fax : (011) 23314932 URL: www.nmnh.org
Regional Centres of ZSI		
1.	Zoological Survey of India North Eastern Regional Centre Fruit Garden, Risa Colony, Shillong - 793003, Meghalaya	Tel: 0364-2223638 Fax: 0364- 2226495 Email: zsishillong@rediffmail.com

S. No.	Centres of Excellence	Contact Details
2.	Zoological Survey of India, Western Regional Centre, Vidyanagar, Sector-29, PCNT Post, Rawet Road, Akurdi, Pune-411 044. Maharashtra.	Tel: 020-27655213/27651927 Fax: 020- 27652564 Email: wrszsi@pune@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: srideeep@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 Saproon, 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

S. No.	Centres of Excellence	Contact Details
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 bsibsishll@yahoo.co.in

S. No.	Centres of Excellence	Contact Details
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

S. No.	Centres of Excellence	Contact Details
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		
6.	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 2012-13

Environment Research Programme (EnvRP)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Reduction of Chromium Toxicity using Nanoparticles: Laboratory and Field Scale Study.	Dr. Debajyoti Paul, Department of Civil Engineering, Indian Institute of Technology, Kanpur-208016, U.P.
2.	Efficacy Validation of Soil Amendments and Microbial Cultures in Reducing Pesticide Residues in Soil, Crops and Ground Water under Field conditions.	Dr. Anjana Srivastava, College of Basic Science & Humanities, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand.
3.	Biodiversity of macro fungi in Andhra Pradesh: Application in paper and pulp industries for biobleaching and biopulping.	Dr. M.A. Singara Charya, Department of Microbiology, Kakatiya University, Warangal-506009 (A.P.).
4.	STREAT – Sustainable Semi-Decentralized Sewage Treatment – Wastewater Reuse, Nutrient Recovery and Biogas Production in the Delhi Metropolitan Area.	Dr. Mukesh Khare Professor of Environmental Engineering, Civil Engineering Department, Block IV, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110 016.
5.	Synthesis of Novel Nanosized Semiconductor Photocatalyst for Sonophotocatalytic Degradation of Organic Pollutants from industrial wastewater.	Dr. T. Sivasankar, Department of Chemical Engineering, National Institute of Technology Tiruchirappalli, Tiruchirappalli-620015, (Tamilnadu).

Ecosystem Research Programme (EcRP)

LIST OF SANCTIONED PROJECTS under All India Coordinated Research Project on Sacred Groove Ecosystem Services Assessment (SGESA)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	All India Coordinated Research Project on Sacred Groove Ecosystem Service Assessment: Assessment of Ecosystem Services in sacred grooves of Himachal Pradesh, North Western Himalaya	Dr. S.S. Samant, Scientist-in-charge, Himachal Unit, Theme Head, Biodiversity Conservation and Management, G.B. Pant Institute of Himalayan Environment and Development, Almora, Uttarakhand
2.	All India Coordinated Research Project on Sacred Groove Ecosystem Services Assessment of Meghalaya	Dr. S.K. Barik, Deptt. of Botany, School of Life Sciences, North Eastern Hill University, Shillong
3.	All India Coordinated Research Project on Sacred Groove Ecosystem Service Assessment from Northern Western Ghats of Maharashtra	Dr. Ankur Patwardhan, M.E.S. Abasaheb Garware College, Karve, Road, Pune-411004, Maharashtra

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
4.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment of Central Western Ghats in Karnataka	Dr. T.V. Ramachandra, Energy & Wetland Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
5.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment in the Kerala part of Western Ghat	Dr. U. Chandrashekhara, Scientist in charge, Kerala Forest Research Institute, Sub Centre, Nilambur, Chandakunnu, Malappuram District, Kerala
6.	All India Coordinated Project on Sacred Grove Ecosystem Service Assessment of Goa	Dr. M. K. Janarthanam, Department of Botany, Goa University, Goa
7.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment in Uttarakhand.	Prof. N.P. Todaria, Head, Deptt. of Forestry & N.R., H.N.B. Garhwal University, Srinagar Garhwal-246174, Uttarakhand
8.	All India Coordinated Research Project on Sacred Grove Ecosystem Services Assessment in Arunachal Pradesh.	Dr. O.P. Tripathi, Department of Forestry, North-Eastern Regional Institute of Science & Technology, Nirjuli-791109 (Itanagar), Arunachal Pradesh
9.	All India Coordinated Project on Sacred Grove Ecosystem Services Assessment, Manipur, NE India	Prof. P.S. Yadava, Professor, Centre of Advance Study in life Science, Manipur University, Imphal
10.	All India Coordinated Project on Sacred Grove Ecosystem Service Assessment of Madhya Pradesh"	Dr. Avinash Tiwari, School of Studies in Botany, Jiwaji University, Gwalior (M.P)
11.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment: Evaluation of ecosystem services rendered by sacred forests of Western Odisha	Dr. Niranjana Behera, Professor, School of Life Sciences, Sambalpur University, Jyoti Vihar, Burla-768 019, Odisha
12.	No.22/15/2011-(SG)-REAll India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment in inland plains of Tamil Nadu	Dr.M.Amirthalingam Research Officer, C.P.R. Environmental Education Centre, 1 Eldams Road, Chennai - 600 018, Tamil Nadu
13.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment in Tropical Dry Evergreen Forests on the Coromandel Coast of India	Dr. N. Parthasarathi, Department of Ecology & Environmental Science, Pondicherry University, Puducherry-605 014
14.	All India Coordinated Research Project on Sacred Grove Ecosystem Service Assessment: Evaluation of Ecosystem services provided by sacred groves in selected locations in Karnataka and Kerala	Dr. K. Haridasan, Institute of Ayurveda and Integrative medicine (I-AIM), FRLHT, 74/2, Jarakabande kaval, Attur PO, Via Yelkahanka, Bangalore-560106

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
15.	All India Coordinated Research Project on Sacred Grove Ecosystem Services Assessment of Eastern Ghats”	Prof. K. Kameswara Rao, Deptt. of Environmental Sciences, Andhra University, Visakhapattanam-530 003 Andhra Pradesh

National Natural Resource Management System (NNRMS) Programme

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Application of RS & GIS for Integrated Management of Hasdeo River Watershed (A Tributary of Mahanadi River) in Chhattisgarh	Prof. S.S. Singh, Department of Forestry, Guru Ghasidas University, Bilaspur-495009, Chhattisgarh.
2.	Forest Fire Zonation Mapping in Representative Wildlife Habitats of Madhya Pradesh Using Remote Sensing Technique and Geographic Information System	Dr. R. K. Singh, Remote Sensing Application Centre, M.P. Council of Science & Technology, Vigyan Bhawan, Nehru Nagar, Bhopal-462003
3.	Implication of Changing Climate on Flood Severity in Bihar Flood Plains using Geo-informatics: A case Study of Kosi Basin”	Dr. A.C. Pandey, Department of Remote Sensing, Birla Institute of Technology, Ranchi, Jharkhand.
4.	Desertification Status Mapping of India	Dr. Ajai, Group Director, Marine, Geo & Planetary Science Group, Department of Space, Space Application Centre, Ambawadi Vistar P.O., Ahmedabad-380015.

List of Projects completed during 2012-13

Environment Research Programme (ERP)

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Microbial decolourisation of coloured textile industrial effluents.	Dr. Kamaljit Singh, Department of Applied Chemical Science & Technology, Guru Nanak Dev University, Amritsar-143005, Punjab.
2.	Timber wood protection from wood decaying basidiomycetes using actinomycetes.	Prof. Rajinder K Gupta, School of Biotechnology, Guru Gobind Singh Indraprastha University, New Delhi-110043.
3.	Electroanalytic applications of organic inorganic composite ion exchange material for detection and determination of heavy metals and pesticides residue in water at micro level.	Dr. Asif Ali Khan, Deptt. Of Applied Chemistry, Faculty of Engg. & Tech, Aligarh Muslim University, Aligarh-202002.
4.	Development of technology for biodegradable nursery pots.	Dr. S.P. Agrawal, Director, Material Division, Central Building Research Institute Roorkee-247 667, Uttarakhand.
5.	Effect of heavy metal pollutants on the induction of biomarker protein, metallothionein in the selective edible organisms of the coastal areas of Tamil Nadu.	Dr. S. Vincent, Department of Zoology, Loyola College, Chennai-600034, Tamil Nadu.
6.	Development of solar photo catalysts for the mineralization of pollutants in industrial effluent.	Dr. M. Swaminathan, Professor of Chemistry, Department of Chemistry, Annamalai University, Annamalai Nagar -608002, Tamil Nadu.
7.	Disinfection of river / pond / ground water by novel disinfecting polymers.	Dr. K.M. Popat, Central Salt & Marine Chemical Research Institute, Bhavnagar-364002, GUJARAT.
8.	Two dimensional sheets and interlayers of Hydrotalcite-like materials-potential scope for environmental remediation.	Dr. Kannan Srinivasan, Silicates and Catalysis Discipline, Central Salt & Marine Chemicals Research Institute, Gijubhai Badheka Marg, Bhavnagar-364002, GUJARAT.
9.	Production of Bio-energy During Wastewater Treatment.	Dr. M.M.Ghangrakar, Department of Civil Engineering, Indian Institute of Technology, Kharagpur-721302, WEST BENGAL.
10.	Production of Bioplastics from Agroindustrial wastes.	Dr. J. Kasthuri, Principal Investigator, Department of Zoology, The Standard Fireworks Rajaratnam (SFR) College, Sivakasi-626123.

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
11.	Electrolytic recovery of copper and removal of organic pollutants from copper phthalocyanine dye effluent.	Dr. S. Chellammal, Scientist, OPMEC-CECRI Unit, New Harbour Area, Tuticorin-628004.
12.	Pilot scale optimization of bacterial degradation of lignin and pentachlorophenol for pulp paper effluent decolourization and its application for aquaculture and ferti-irrigation.	Dr. Ram Chandra, Analytical Chemistry Section, Indian Toxicology Research Centre, Post Box No. 80, Lucknow-226001, U.P.
13.	Development of a Bioleaching strategy for sustainable disposal and recycling of e-waste in India.	Dr. Sudhir Syal, Department of Bio-technology and Bio-informatics, JAYPEE University of Information Technology, Waknaghat, Solan, Himachal Pradesh – 173215.
14.	Developing Eco Friendly Microbial Consortia for Pathogen Removal in Sewage Waste Water and Mitigation of Pathogen Entry into Hydrological Cycle.	Dr. P. Dhevagi, Department of Environmental Sciences, Tamil Nadu Agricultural University, Coimbatore-641003, Kerala.

Ecosystem Research Programme (EcRP)

Sl. No.	Title of the project	Name of Principal Investigator (PI) & Institute
1.	Studies on the Diversity and Distribution of Soil Microarthropod Fauna of Grassland and Adjoining Cultivated Fields in subtropical Ecosystems of Cachar, Assam, NE	Dr. D.C. Ray, Dept. Of Ecology, Environmental sciences, Assam University, Silchar, 788 011, Assam
2.	Algal Flora from different habitats of Central Assam and Conservation of Collected Strains	Dr. Farishta Yasmin Senior Lecturer in Botany, Deptt. Of Botany, Nowgong College, P.O. Nagaon, Assam- 782 001
3.	Plant functional Trait Analysis of Dry Tropical Forest Ecosystems".	Dr. A.S. Raghubanshi Reader, Centre for Advanced Study in Botany, Banaras Hindu University, Varanasi- 221005
4.	Study of Ant species abundance and composition with respect to functional groups from lower Shivalik range	Dr. Himender Bharati, Lecturer, Deptt. Of Zoology, Punjab University, Patiala-147 002.
5.	Development of nursery technology and measurement of ecological and natural regeneration status of chilgoza pine (Pinus gerardiana wal) – a rare and endangered species of India"	Dr. G.S. Shamet, Professor (Ecology), Deptt. Of Silviculture & Agroforestry, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, solan-173230(HP)
6.	Diversity of Vermifauna and their population dynamics in Kolli Hills, a part of Eastern Ghats, Tamil Nadu	Dr. P. Neelnarayan, Nehru Memorial College, Puthanampatti-621007 Tiruchirapalli (Dt.), Tamil Nadu

National Natural Resource Management System (NNRMS) Programme

Sl. No.	Title of the Project	Name of Principal Investigator (PI) & Institute
1.	Assessment and Evaluation of Sea Grass Resources of India in Two Oceanic Island groups (Andaman and Nicobar and Lakshadweep), through Conventional Ground Surveys and Satellite Remote Sensing	Dr. T. Thangaradjou, Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai – 608 502, Cuddalore Dt., Tamil Nadu
2.	Ecosystem Research Project on Land Use Dynamics and its Impact on Carbon Sequestration, Nitrogen Cycling and Bio-diversity of Tropical Forest Eco-systems of Chhattisgarh through Remote Sensing and GIS Techniques	Dr. S. L. Swamy, Department of Forestry, Indira Gandhi Agricultural University, Krishak Nagar, Raipur-492 006, Chhattisgarh
3.	Forest Encroachment Mapping in Uttar Pradesh using Remotely Sensed Data and Geographic Information System (GIS)	Director, Forestry Training Institute, H-2, Block, Kidwai Nagar, Kanpur-208 011, U.P.
4.	Development of a comprehensive information system with GIS, GPS and Remote sensing interface for environment impact assessment of the proposed river link canal projects of Peninsular India	Dr. B. Prakasa Rao, Professor, Department of Geo-Engineering, College of Engineering, Andhra University, Visakhapatnam-530003.
5.	Inventorizing Sacred Groves of Jharkhand forests and their Characterization through RS-GIS technology	Dr. R.K. Sinha, Centre for Regional Studies, T.M. Bhagalpur University, Bhagalpur-812007
6.	Use of Remote Sensing and GIS for urban solid waste disposal (Identification of Dumping site and optimal transportation Route Modeling)	Prof. Anjana Vyas, Centre for Research and Development Unit (CRDU), CEPT, K.L. Campus, Navrangpura, Ahmedabad-380009, Gujarat
7.	Landslide hazard zonation of Kalingpung subdivision of West Bengal and creation of a portal to upload Landslide hazard map and all other maps created using open GIS	Dr. P.K. Paul, Department of Mining Engineering, Bengal Engineering and Science University, Shibpur, Howrah-711103, West Bengal

Biosphere Reserves

S. No.	Title of the Project	Name of Organization
1.	Management of Manas Biosphere Reserve through Biodiversity Evaluation in Gap areas and community participation.	Gauhati University, Gauhati

National River Conservation Plan States

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
1.	ANDHRA PRADESH	
	Principal Secretary, Municipal Administration & U.D. Development, Govt. of Andhra Pradesh, A.P. Secretariat, Hyderabad-500 022 Tel+Fax- 040-23450622	Dr. P. Panduranga Rao, Engineer-in Chief, Public Health Engg. Department, A.C. Guards, Hyderabad-500004 Phone: 040-23391208 Fax: 040-23393371
		Shri Adhar Sinha, Managing Director, Hyderabad Metropolitan Water Supply & Sewerage Board, Khairtabad, Hyderabad-500 004 Phone : 040-23442844Fax: 23442855
2.	BIHAR	
	Shri Sudhir Kumar Secretary, Deptt. of Urban Development, Govt. of Bihar, Vikas Bhawan, Patna-800 015. Phone: 0612-2223580(O) Fax: 2223059	Shri Anupam Kumar Suman 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
3.	GOA	
	Mr. Michael D'Souza Director/Joint Secretary, Deptt. Of Science, Technology & Environment, Govt of Goa, opp. Saligao Seminary, P.O-Saligao Bardez, Panaji-403 511 Tel./ Fax.- 0832-24152201(O)	
4.	GUJARAT	
	Shri I.P. Gautam, Principal Secretary, U.D. & Urban Housing Department, Sachivalaya, 9th floor, Block no-14 Gandhi Nagar, Gujarat-382 010 Phone : 079-23251001 Fax: 079-23251005	Dr. Guruprasad Mohapatra, Municipal Commissioner, Ahmedabad Municipal Corporation, Ahmedabad-380 001 Phone : 079- 25352828 Fax : 079-25354638

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
5.	HARYANA	
	Shri Naresh Gulati Fin. Commissioner & Pr. Secretary, Public Health Engineering Deptt, Govt. of Haryana Civil Sectt., Chandigarh Tel./Fax.- 0172-2704453 (O)	Shri A.K. Khetrapal 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
6.	JHARKHAND	
	Shri Nitin Madan Kulkarni Secretary, Deptt. Of Urban Development, Govt. of Jharkhand, Project Building, Dhurwa, 4th floor, Ranchi.-834004 Phone: 0651-2403961(O) Fax: 0651-2400966	
	Shri A.K. Mishra Director Municipal Administration Govt of Jharkhand 3rd Floor, Project Building Dhurwa, Ranchi-834004 Fax- 0651-2400966/2400961	
7.	KARNATAKA	
	Smt. Meera Saxena Principal Secretary (Env) Govt. of Karnataka Bangalore	For Core Scheme: i) Chairman & Managing Director, Bangalore Water Supply & Drainage Board, KHB Complex, Cauvery Bhawan, K.G. Road, Bangalore-560 009. Fax: 080-2217743(O)/6686855 (R) Phone: 080-2217743/2230080
		For Non-core Scheme: ii) Member Secretary, Kr S.P.C.B., 6, 7, 8 & 9th floor, Public Utility Building, M.G. Road, Bangalore-560 001 Karnataka

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
8.	KERALA	
	Shri V.J. Kurian Principal Secretary Water Resources (Irrigation) Deptt, Public Officer Building Government of Kerala, Thiruvananthapuram- 695033 Tel: 0471-2324394 Fax: 0471-2324394	The Managing Director Karnataka Urban Water Supply & Drainage Board, Jalbhavan 1st stage, 1st phase, BTM Layout, Bannerghatta Road, Bangalore -560029 Phone: 080-41106504 Fax: 080-26539206
9.	MADHYA PRADESH	
	Shri R. Parasuram, Chief Secretary, Govt. of Madhya Pradesh Bhopal	i) Member Secretary, M.P. Pollution Control Board, Paryavaran Parisar, E-5, Arera Colony, Bhopal-462 013 Phone: 564428 Fax: 0755-2463742, 0755-2462136
	Shri Iqbal Singh Bains 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	ii) Shri N.K.Sehra, E-N-C, PHED, Govt. of M.P. Satpura Bhawan, Bhopal Phone: 2561260, 2566990
		iii) Executive Director, Environment Planning & Coordination Organization (EPCO) Paryavaran Bhawan, E-5, Area Colony, Bhopal-462016 Fax: 0755-2462136
10.	MAHARASTRA	
	Ms. Valsa Nair Singh, Secretary, 15th Floor, New Admn Building, Environment Department, Govt. of Maharashtra, Mantralaya, Madam Cama Road, Mumbai-400 032 Phone: 022-22793132 Fax : 022-22813947	i) Shri R.L. Mopalwar, Member Secretary, Maharashtra Jeevan Pradhikaran (MJP) 4th floor, Express Tower, Nariman Point, Maharashtra Phone: 022-22025354(O) Fax: 022-22029348

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
		ii) Municipal Commissioner, Nasik Municipal Corporation Nasik, Maharashtra Phone: 0253-2578206(O) Fax: 2577936
11.	NAGALAND	
	Addl. Chief Secretary, Govt. of Nagaland, Kohima, Fax: 0370-2290470	Shri Zailo Secretary, PHED Kohima
12.	NCT DELHI	
	Shri Rakesh Mehta Chief Secretary Govt. of NCT of Delhi Delhi Secretariat IP Estate, New Delhi-1100 02	Shri Ramesh Negi Chief Executive Officer, Delhi Jal Board, Varunalaya Phase-II, Jhandewalan, Delhi-110 005. Phone: 23511658 Fax: 23516182
	Shri R. Chandra Mohan Principal Secretary(UD) cum Commissioner, 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
	Shri Keshar Chandra Secretary (Environment), Govt. of NCT of Delhi, Delhi Secretariat, IP Estate New Delhi. Fax: 23392034/23392102	Shri K. S. Mehra Commissioner, Municipal Corporation of Delhi Town Hall Chandni Chowk, Delhi-110 006 Phone: 23961012, 23967315 Fax: 23965016/23392102
	Shri J. S. Kamyotra Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, CBD Shahadra, Delhi- 110032 Phone: 22307078(O)	Dr. Indrani Chandrashekharan Adviser (E&F) Planning Commission, Yojana Bhawan, New Delhi – 110 001. Phone: 23096536, 23096666/2300
	Prof. S.P. Gautam Chairman, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, CBD Shahadra, Delhi – 110 032 Phone: 22304948 (O)	

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
13.	ODISHA	
	Shri Saurab Garg Commissioner cum Secretary, Housing & Urban Development, Govt. of Orissa, Civil Secretariat Bhubaneshwar-751 001 Phone: 2536903 Fax: 2394984	Shri P.B. Raut Member Secretary Orissa Water Supply and Sewerage Board, Satya Nagar, Bhubaneswar. Phone: 0674-2571185 (O) Fax: 2571348
14.	PUNJAB	
	Principal Secretary, Department of Local Govt. Govt. of Punjab, Punjab Civil Secretariat, Chandigarh	Shri Satpal Angurala Managing Director, Punjab Water Supply & Sewerage Board, Plot I-B, Sector-27A, Madhya Marg, Chandigarh Phone : 0172- 2651164(O) Telefax : 0172: 2656526 E-mail : pwssbchd@hotmail.com
15.	RAJASTHAN	
	Secretary, Local Self Govt. Deptt., Govt. of Rajasthan, Secretariat, Jaipur-5 Fax: 0141-2227744	(i) Chief Engineer (HQS) Public Health Engg. Department, Govt. of Rajasthan, F-18, New Building, 1st Floor, 2, Civil Lines, Jaipur-302006 Fax: 0141- 2222585 / 2220553
		(ii) Secretary, Urban Improvement Trust, Near C.A.D. Circle, Kota, Rajasthan Fax: 0744-2500828
16.	SIKKIM	
	Shri T.B. Rajalim, PCE-cum-Secretary, Govt. of Sikkim, Water Security & PHED, Nirman Bhawan, Gangtok-737101 Tele/Fax: 03592-202671	Shri T.B. Rajalim, PCE-cum-Secretary, Govt. of Sikkim, Water Security & PHED, Nirman Bhawan, Gangtok-737101 Tele/Fax: 03592-202671
17.	TAMIL NADU	
		Dr. T.S. Srinivasanvilley, IFS, Member Secretary (EMAT), G F, Pangal Building, No.1 Jeenis Road, Saidapet, Chennai-600 015. Phone: 044-24336421(O) Fax: 044-24336594 (R)

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
		Shri Rajesh Lakhoni Managing Director, CMWSSB, No-1, Pumping Station Road, Chintadripet, Chennai-600 002 Phone: 044-28549000 Fax: 044-28419643
		Shri Gagandeep Singh Bedi, Managing Director, TWAD Board No. 32, Kamarajar, Chepauk, Chennai-600 005 Phone: 044-25670491(O) Fax: 044-25679866
18.	UTTAR PRADESH	
	Shri Alok Ranjan Principal Secretary, Department of Urban Development, Govt. of U.P., Babu Bhawan, Secretariat, Lucknow – 226 001 Phone: 0522-2237314(O) Fax: 0522-2235241	Shri V.U. Bishnoi Managing Director, U.P. Jal Nigam, 6, Rana Pratap Marg, Lucknow (UP) Phone: 0522-2626497 Fax: 0522-2622389, 2626360
	Shri Javed Usmani Chief Secretary, Govt. of Uttar Pradesh Vidhan Bhawan, Lucknow, UP	
19.	UTTARAKHAND	
	Shri Utpal Kumar Singh Principal Secretary, (Peyjal) Govt. of Uttarakhand, Dehradun Secretariat, 4 Subhash Road, Uttaranchal Fax: 0135- 2712114/2712922	Shri Bhajan Singh, Managing Director Uttarakhand Peyjal Sansadhan Vikas Evam Nirman Nigam, 11, Mohini Road, Dehradun Phone: 0135-2676812 (O) Fax: 0135-2672337
20.	WEST BENGAL	
	For NRCP	
	Shri Debashish Sen, Principal Secretary to the Government of West Bengal, Department of Urban Development, Nagarayan Bhawan, DF-8, Sector-I, Salt Lake City, Kolkata, Fax: 033-23347880	Shri Chunar De, Programme Director, SPMG, WB, Nagarayan Bhawan, DF-8, Sector-I, Salt Lake City, Kolkata, Fax: 033-23347880

	NODAL DEPARTMENT	NODAL IMPLEMENTING AGENCY
		Shri Vivek Bhardwaj, Chief Executive Officer, KMDA, Prashasan Bhawan, DD-I, Sector-I, Kolkata-700 064 Phone: 033-23597915/7988 Fax: 033-23597881/23593563
	For CETP	
	Shri Alapan Bandhopadhyay, Principal Secretary, Department of Municipal Affairs, Writers Building, Kolkata-700001, Fax: 033-22143853	Special Secretary, Commerce & Industries Dept. Govt. of West Bengal, 4 Camac Street, Kolkata – 700 016 Fax: 033 – 22820790
21.	JAMMU & KASHMIR	
	Smt. Naseem Lanker Secretary Housing & Urban Development Government of J&K, Srinagar	Shri Irfan Yaseen Vice Chairman, J&K Lakes and Waterways Authority Development, Wali's House, Braine, Nishant, Srinagar (J&K) Fax: 0194-2464015/16

List of wetlands of International Importance from India under Ramsar Convention

S. No	Name of Wetland	State	Date of declaration
1.	Chandrataal	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.	Tsomoriri	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 MR	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 MR	Rajasthan	01.10.81
26.	Nalsarovar	Gujarat	29.09.12

MR – Montreux Record

List of Wetlands Identified under National Wetland Conservation Programme

Sl. No.	State/UT	No.	Name of Wetlands
1.	Andhra Pradesh	1.	Kolleru
2.	Assam	2.	Deepar Beel
		3.	Urpada 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
		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

Sl. No.	State/UT	No.	Name of Wetlands
		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 Sanct.
		53.	Ghatigaon
		54.	Ratapani
		55.	Denwa Tawa wetland
		56.	Kanha Tiger Reserve
		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.	Pandecheri	73.	Ousteri lake
17.	Punjab	74.	Harike
		75.	Ropar
		76.	Kanjli
		77.	Nangal

Sl. No.	State/UT	No.	Name of Wetlands
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 Calimere
		86.	Kaliveli
		87.	Pallaikarni
21.	Tripura	88.	Rudrasagar
		89.	Gumti reservoir
22.	Uttar Prdaesh.	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.	Uttaranchal	106.	Ban Ganga Jhilmil Tal
		107.	Asan
24.	West Bengal	108.	East Calcutta Wetland
		109.	Sunder bans
		110.	Ahiron Beel
		111.	Rasik Beel
		112.	Santragachi
		113.	Patlakhawa- Rasomati
25	Meghalaya	114.	Umiam lake
26.	UT (Chandigarh)	115.	Sukhna

Names of Nodal Agencies of NGC Programme

S. No.	State/Union	State Nodal Agency
1.	Jammu & Kashmir	Dr. Mohit Gera Member Secretary, J & K Pollution Control Board Rajbagh, Bhilawad Silk Factory Srinagar, Jammu & Kashmir, Email: mohitgera87@gmail.com Website : http://www.jkspcb.in/
2.	Himachal Pradesh	Mr. Ravi Sharma Senior Scientific Assistant , SCSTE State Council for Science, Technology And Environment 34, SDA Complex Kasumpti, Shimla, Himachal Pradesh-171009 Mob. No. 9418084973 Email: ravism17@yahoo.com Website : http://www.hpscste.gov.in/
3.	Punjab	Dr. Satnam Singh Ladhar Joint Director (Environment), Punjab State Council for Science and Technology Near Scared Heart School, Sector - 26 Chandigarh-160019 Mob. No.: 9463200886 Email: ssladhar@yahoo.com, ngcpunjab@yahoo.com Website : http://www.pscst.com/
4.	Chandigarh	MR. P.J. S. Dadhwal, Additional Director Department of Environment Chandigarh Administration, Additional Town Hall Building II Floor, Sector -17, Chandigarh Mob. No.: 09855616338 Email: dadhwal@yahoo.com, dadhwalpjsd@gmail.com Website : http://chandigarhenvi.gov.in
5.	Uttar Pradesh	Mr. Neeraj Chaturvedi Accounts Officer Uttar Pradesh Pollution Control Board, Picup Bhawan, 3rd Floor, B-Block, Gomti Nagar, Vibuthi Khand, Lucknow, Uttar Pradesh Email: info@uppcb.com Website : http://uppcb.com/

S. No.	State/Union	State Nodal Agency
6.	Bihar	Mr. Manoj Singh Member Secretary Bihar State Pollution Control Board Beltran Bhawan Shastri Nagar Patna – 800023, Bihar Mob. No.: 09431081204 Email: issingh123@rediffmail.com, mjkr09@gmail.com Website : http://bspcb.bih.nic.in
7.	Uttarakhand	Mrs. Pushpa Manas Additional State Project Director Sabhi ke liye (Kendriya) Shiksha Parishad S-1, C-10 Defence Colony, Dehradun, Uttarakhand Mob. No.: 9412056645 Email: euadpep@vsnl.net Website: http://gov.ua.nic.in/ssaua/register.html
8.	Orissa	Prof. Sailadala Padhi Nodal Officer, Centre for Environmental Studies Forests & Environmental Department Govt. of Orissa, N-1/247 I. R. C. Village, Bhubaneswar-15 Orissa Mob. No.: 09937095353 Email: cesorissa@rediffmail.com Website : http://www.cesorissa.org/
9.	West Bengal	Mr. Sandipan Mukharjee Member Secretary West Bengal Pollution Control Board (WBSPCB), Paribesh Bhawan, 10A Block-L.A. Sector III , Salt Lake, Kolkata 700098 Mob. No.: 9830672363 Email: wbpcbnet@wbpcb.gov.in Website : http://www.wbpcb.gov.in/
10.	Jharkhand	Mr. Sanjay Kumar Sinha Nodal Officer Member Secretary, JSPCB Jharkhand State pollution Control Board, T A Division Building H.E.C. Dhurwa Ranchi, 834004, Jharkhand Mob. No.: 9835907525 Website : http://www.jspcb.org/
11.	Haryana	Dr. Raj .K . Chauhan Scientist G-I Haryana State Pollution Control Board, Madhya Marg, SCO-11-12, Sector -7-Chandigarh Haryana-160001 Mob. No.: 9417153589 Email: rajkc52@yahoo.co.in Website : http://hspcb.gov.in/

S. No.	State/Union	State Nodal Agency
12.	Delhi	Dr. B.C. Sabata Senior Scientific Officer Department of Environment Government of NCT Delhi Room No. C-610, Level-6, C-Wing, Delhi Secretariat, I.P. Estate, New Delhi-02 Mob. No.: 9717593506, 23392032 Email: bcsabat@yahoo.com, ecoclub_delhigovt@yahoo.com Website : http://www.delhi.gov.in/wps/wcm/connect/Environment
13.	Rajasthan	Dr. S.R. Jain State Secretary Rajasthan State Bharat Scout & Guide, State Headquarters, JLN Marg, Bajaj Nagar, Jaipur-302015 Contact Person : Mr. Goparam Mali Rajasthan Mob. No.:9414405255 Email: rajscoutguide@yahoo.com
14.	Gujarat	Mr. N.K. Nanda Deputy Director Gujarat Ecological Education and Research Foundation (GEER), Near Indrora park, Sector - 9, Gandhi Nagar, Gujarat - 382009 Website : http://www.geerfoundation.gujarat.gov.in
15.	Dadra & Nagar Haveli	Sh. M.R.G. Reddy Member Secretary Pollution Control Committee (PCC), Dadra & Nagar Haveli, Silvassa Tele-fax: 0260-2630260 Website : http://www.pccdaman.info/
16.	Daman & Diu	Sh. M.R.G. Reddy Member Secretary Pollution Control Committee (PCC), Daman & Diu Tele-fax: 0260-2630260 Website : http://www.pccdaman.info/
17.	Madhya Pradesh	Mrs. Sadhna Tiwari Scientific Officer Environment Protection and Coordination Organization -EPCO Bhopal (Housing Envnt dept), Parayavaran Parisar, E-5 sector, Arera Colony, Bhopal – 462078, Madhya Pradesh Mob. No.: 9827285487 Email: sadhana@epco.in,sadhanahk@yahoo.co.in

S. No.	State/Union	State Nodal Agency
18.	Goa	Shri Joseph S R De Souza Chief scientist Goa State Council of Science & Technology Department of Science, Technology & Environment Opp. Saligac Seminary, Saligao, Barcez Goa – 408511 Mob: 9623255354 Website : http://dstegoa.gov.in/aboutus.htm
19.	Maharashtra	Shri Tasneem Ahmad Director Maharashtra ekatmik padik jamin vikas yantrana Directorate of social forestry Maharashtra state Central administrative building ground floor, pune-411001 Mob. No. 09421788704 Email id: dirdspune@vsnl.net
20.	Chattisgarh	Mr. Amar Savant Nodal Officer I/C, Chattisgarh Environment Conservation Board (CECB), Raipurdr.apsawant@rediffmail.com Chattisgarh Mob. No.: 9425584333 Email: cececb@rediffmail.com , dr.apsawant@rediffmail.com Website : http://enviscecb.org/
21.	Assam	Mr. Jaideep Baruah Head I/C Environment Division Assam Science, Technology and Environment Council (ASTEC) G.S. Road, Guwahati- 781003 Assam Mob. No.:9435102089 e-mail: astec@rediffmail.com ; jaideep82@hotmail.com , j.baruah@nic.in Website: http://www.astec.gov.in/
22.	Manipur	Dr. M. Gonchandra Sharma Principal Scientific Officer Manipur Pollution Control Board, Lamphepat, Imphal West – 795004. Manipur Mob. no.: 9662593360 e-mail: mpollution2006@yahoo.co.in , gonchandra@yahoo.com , gonchandra@gmail.com
23.	Meghalaya	Mr. Sunil Kumar Additional PCCF Chief Conservator of Forests (HQ) Department of Forests & Environment Govt of Meghalaya Sylvan House, Lachumere Shillong – 793001. Meghalaya Mob. No.: 09436999140 Email: sunilkumar78@nic.in , snlkmr696@gmail.com Contact person: Shri BahsukSupt. Wild Life Division Mob. No.: 09436105778

S. No.	State/Union	State Nodal Agency
24.	Mizoram	Mr. C. Laldhawma Mizoram Pollution Control Board, MG Road, Aizawl-796001. Mizoram Mob. No.: 09436142012 Email Id: duhawma15@yahoo.com
25.	Nagaland	Mr. Rusovil John Member Secretary Nagaland Pollution Control Board, Signal Point, Dimapur, Nagaland Mob. No.: 09436003731 Email: npc2@yahoo.com, ngc.nagaland@yahoo.com
26.	Sikkim	Mr. B.K. Tewari Chief Conservator of Forests, Landuse and Environment Section (LU & E) Dept. of Forests, Environment and Wildlife Management, Deorali, Gangtok- 737101. Sikkim Mob. No.: 09434723413 Email: sik@envis.nic.in
27.	Tripura	Shri Bishu Karmakar Sr. Lab. Asstt. NGP programme Tripura State Pollution Control Board, Tripura (W), Agartala - 799001, Tripura Kechowmujani Contact Person: Shri Amarendra Jamatia Mob. No.: 09436168371 e-mail: ajamatia@rediffmail.com
28.	Arunachal Pradesh	Shri N. Tam Member Secretary Nodal Officer & Member Secretary Arunachal Pradesh State Pollution Control Board, Department of Environment and Forests, PCCF's office, "Zero Point" Tiniali, Itanagar- 791111. Arunachal Pradesh Mob. No.: 09402278748 Email: arunachalspcb@gmail.com Website: http://www.apspcb.org.in/
29.	Andaman & Nicobar Islands	Mrs. N. Kala Conservator of Forests, Department of Forests, Vansadan, Haddo, Port Blair Andaman & Nicobar Islands Mob. No.: 9434284822 Email: vaishnavi_bharti@yahoo.com
30.	Lakshadweep Islands	Dr. Sayedis Mailkoia Dy. Conservator of forests, Department of Environment and Forests UT Administration of Lakshadweep, Kavaratti - 682555. Lakshadweep Islands Ph. No. 04896-26289, Fax No.: 04896-262598

S. No.	State/Union	State Nodal Agency
31.	Pondicherry	Mr. V. Ramalingam Programme Coordinator Environment Education Directorate of School Education State Training Centre, Pondicherry Ph. No.: 0413-2200255, ext. 370 Fax No.:0413-2205419
32.	Andhra Pradesh	Mr. W.G . Prasanna Kumar Director, National Green Corps, Andhra Pradesh 214-K Block, AP Secretariat, Hyderabad, Andhra Pradesh Mob. No.9849908831 Email: ngcap.vir@gmail.com
33.	Karnataka	Mr. R.M.N. Sahai Director General Environment Management & Policy Resaerch Institute(EMPRI), 'Hasiru Bhavana' Doresanipalya Forest campus, J.P. Nagar 5th Phase Bangaluru 560078 Karnataka Mob. No.: 09480265641, 08026490747 Email:empri.ber@gmail.com
34.	Kerala	Dr Kamalakshan Scientific Officer, Kerala State Council For Science Technology & Environment (KSCSTE) Sasthra Bhawan, Pattom Thiruvananthapuram-04 Kerala Mob No.: 09447489587 Phone No. 0471-2543701-05 Email: drkhokkal@yahoo.com Website: http://www.kscste.kerala.gov.in/
35.	Tamil Nadu	Mr. Thiru Vengadam Co-ordinator Department of Environment Ground Floor, Panagal Buildings 1, Jeenis Road Saidapet Chennai - 600 015 E-mail : tndoe@eth.net Tamil Nadu Mob. No.: 9444159948 Email: tndoe@eth.net

List of Regional Resource Agencies (RRAs) under NEAC

S. No.	Name of the Organisations	Area under Jurisdiction
1.	Shri K. Narendra Nath Reddy, Chairman Sri Swarupa Nistha Ashrama Philosophical Welfare Society (SNAPS), H.No.1-1189-99, 1st Floor,N.G.O. Colony, Kadiri-515591 Ananthapur Distt. Andhra Pradesh	Andhra Pradesh (South)
2.	Shri P.V. Subbarao, NEAC Convenor Deccan Development Society Flat No. 101, Kishan Residency House No. 1-11-242/1 Street No. 5, Begum Pet, Hyderabad-500016, Andhra Pradesh	Andhra Pradesh (North)
3.	Shri B.P.Duarah, General Secretary Assam Science Society, Jawaharnagar, Khanapara, Guwahati-781022, P.B. No. 78, Assam	Assam
4.	Shri Kameshwar Ojha, General Secretary Rural Youth Coordination centre Road No. 2 Manas Marg, House No.- 15, West Shiv puri, Distt. : Patna, Bihar Pin- 800 023	Bihar
5.	Shri S.N. Singh, Director Jan Kalyan Parishad, Moh. Namana kala Ring Road, (Near Cormel School), Ambikapur, Distt.- Surguja- 497 001 Chattisgarh	Chattisgarh
6.	Dr. Desh Bandhu, President Indian Environmental Society U- 112, Vidhata House, 3rd Floor Vikas Marg, Shakarpur, Delhi 110092	Delhi & Western U.P.
7.	Mr. Dilip Surkar, Director, Vikram Sarabhai Centre for Development Interaction (VIKSAT), Nehru Foundation for Development Taltej Tekra, Vastrapur Road Ahmedabad- 380 054	Gujarat & Daman Diu

S. No.	Name of the Organisations	Area under Jurisdiction
8.	Ms. Rani Peter, General Secretary Haryana Nav Yuvak Kala Sangam (HNYKS) "Ishwar Sadan", Near Chaubisee Ka Chabutra, Meham, District : Rohtak- 124 112, Haryana	Haryana
9.	Shri Nagar Nanda, Member Secretary State Council for Science, Technology & Environment Block 34, SDA Complex, Kasumpti Shimla- 171009	Himachal Pradesh
10.	Dr. C.M. Seth, Chairperson World Wide Fund for Nature-India Jammu & Kashmir State Office C/O Centre for Environment Education & Training, New University campus, Jammu- 180006	Jammu
11.	Shri. Imtiyaz Hussain, Chairman & Chief Executive, The NGOs Co-ordination Federation (J&K) Usman Complex Solina, Srinagar- 190009 (J&K)	Kashmir Including Ladakh
12.	Ms. Jayanti P. Dutt, Secretary Gram Vikas Kendra K- 3/57, Hans Stoehr Road, TELCO Colony Jamshedpur- 831004	Jharkhand
13.	Prof. K.S. Nataraj, CEO Karnataka Rajya Vijnana Parishat, Vijnana Bhawan, No. 24/2 & 24/3, 21st Main Road Banashankari-II Stage, Bangalore- 560070	Karnataka
14.	Shri Babu Ambat, Executive Director Center for Environment & Development, Thozhuvancode, Vattiyookavu P.O., Thiruvananthapuram, Kerala- 695013	Kerala, Lakshwadeep & Minicoy Island
15.	Shri. G.G. Sohani, President BAIF Development Research Foundation BAIF Bhawan, Dr. Manibhai Desai Nagar National Highway No. 4, Wajre, Pune- 411058	Maharashtra, Goa & Dadar Nagar Haveli
16.	Dr. Homeshwar Singh, senior Scientific Officer Environment & Ecology Wing Deptt. Of Environment And forests Government of Manipur Porompay, Near D.C. Officer Imphal (East)- 795001	Manipur

S. No.	Name of the Organisations	Area under Jurisdiction
17.	Shri Ashok Shah, IAS Executive Director Environmental Planning & Coordination Organisation (EPCO) "Kachnar" Paryavaran ParisarE- 5, Arera Colony, Bhopal- 462016	Madhya Pradesh
18.	Shri A.C. Zonunmawia, Coordinator & Chairman Center for Environment Protection (CEP) B-27/ 1, Tuikual South, Aizwal- 796 001, Mizoram	Mizoram
19.	Shri Rusovil John, Member Secretary Nagaland Pollution Control Board, Signal Point, Dimapur, Nagaland- 797112	Nagaland
20.	Shri P.M. Dash, Programme Officer Centre for Environment Studies, Forests and Environment Department, Government of Odisha, N-1/247, I.R.C. village Bhubaneshwar- 751 015	South Odisha
21.	Shri D.N. Rout, General Secretary Animal Welfare Society of Orissa, Branch Office: at/ Po- Bhandaripokhari, Distt.- Bhadrak, Odisha Head Office: Qr. No. 4R/2, Unit-8 Gopabandhu Square, Bhubaneshwar- 751012	North Odisha
22.	Ms. Neelima Jayarath, Executive Director Punjab State Council for Science & technology, MG SIPA Building, Near Sacred Heart School Sector -26, Chandigarh-160019	Punjab & Chandigarh & Uttarakhand
23.	Shri Paradeep S. Mehta, Secretary General Consumer Unity & trust Society(CUTS), D- 217, Bhaskar Marg, Bani Park, Jaipur- 302016, Rajasthan	Rajasthan
24.	Dr. (Mrs.) Nanditha Krishna, Director C.P. Ramaswamy Aiyar Foundation, The grove, 1- Eldmas Road, Alwerpet, Chennai- 600018	Tamil Nadu (North) Andaman Nicobar
25.	Dr. (Mrs.) Nanditha Krishna, Director C.P. Ramaswamy Environmental Education Centre No. 1-A, Eldams Road, Chennai- 600018	Puducherry

S. No.	Name of the Organisations	Area under Jurisdiction
26.	Shri J. Paul Bhaskar, Chairman Peace Trust, Near Police Colony, Trichy Road, Dindigul- 624005, Tamilnadu	Tamilnadu (South)
27.	Shri Mihir Deb Chairman, Tripura State Pollution Control Board Parivesh Bhawan, Pandit Nehru Complex, Gorkhabasti, P.O.- Kunjaban Agartala-799006	Tripura
28.	Shri S.T. Lachungpa PCCF- Cum- Secretary and Chairman, State Environment Agency Forest, Environment and Wild Management Department, Government of Sikkim Gangtok- 737101	Sikkim
29.	Dr. B.C. Shrivastava, Secretary Shohratgarh Environment Society Premkunj, 9, Adarsh Colony, Shohratgarh Siddhartha Nagar Distt. 272205 (U.P.)	Uttar Pradesh (East)
30.	Prof. Gauri Ghatak, Director- Convenor School of Fundamental Research 29, Pratapaditya Road Kolkata- 700026	West Bengal (Except Darjeeling Hilly Areas and Silliguri)
31.	Dr. Bharat Prakash Rai, Secretary Federation of Societies for Environmental Protection (FOSEP), Dr. S.M. Das Road, Red Cross Building, Darjelling- 734101	Darjeeling Hilly Areas & Siliguri
32.	Sh. B.S. Sajwan Principle Chief Conservator of Forests & Principle Secretary, Department of Environment & Forests 'P'- sector, Government of Arunachal Pradesh, Itanagar- 791111 The Director, State Forest Research Institute cum Chair person, Arunachal Pradesh Forest Research and Development Agency (A.P.F.R.D.A.), Van Vihar, Itanagar, P.b. No. 159, Arunachal Pradesh	Arunachal Pradesh
33.	Shri V.K. Nautiyal, IFS, PCCF/ Chief Conservator of Forests, Social Forestry Principle of Chief Conservator of Forests Dept. of Forests and Environment Govt. of Meghalaya, Sylvan House, Lower Lachumiere, Shillong- 793001 Meghalaya	Meghalaya

List of ENVIS Centres

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
ENVIS Institutional Centres (Subject Specific)			
1.	Central Pollution Control Board (CPCB)	Shri G. Ganesh, ENVIS Coordinator (9213828705) Parivesh Bhawan, East Arjun Nagar, Delhi-110 032 Phone: 011-22301932, 43102258 Fax: 011-22304948, 22301932, 43102258 Email: cpcb-envi@nic.in URL: www.cpcbenvvis.nic.in	Control of Pollution (Water, Air and Noise)
2.	Indian Institute of Toxicology Research (IITR)	Dr. K.C. Gupta, Director Shri Shailendra Kumar Gupta, ENVIS Coordinator Post Box No.80, Mahatma Gandhi Marg, Lucknow-226 001, Uttar Pradesh Phone+91-522-2284591, +91-522-2627586, 2613786 (Ext. 308) Mobile: 0 9839533951 Fax: +91-522-2628227, 2611547 Email: itrc@envis.nic.in, envis@iitr.res.in, director@iitrindia.org URL: www.itrcenvis.nic.in	Toxic Chemicals
3.	National Institute of Occupational Health (NIOH)	Dr. P.K. Nag, Director Dr. Sunil Kumar, ENVIS Coordinator Meghani Nagar, Ahmedabad, Gujarat-380016 Phone: 079-22688842 Fax: 079-22686361, 22686110 Coordinator : 09426395738 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)	Prof. R. Sukumar, Chairman Dr. T.V. Ramachandran, ENVIS Coordinator Bengaluru, Karnataka-560 012, Bengaluru Phone: 91- 080-22933099, 23600985, 22932506, 23601428, 23600085, 23600683 Email: envis@ces.iisc.ernet.in, cestvr@ces.iisc.ernet.in URL: http://ces.iisc.ernet.in/biodiversity	Western Ghats Ecology and Biodiversity

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
5.	Centre for Advanced Study in Marine Biology (CASMB)	Prof. Dr. K. Kathiresan, Director and ENVIS Coordinator Annamalai University, Parangipettai-608 502, Tamil Nadu Phone: 04144-243223, 243533 Fax: 04144- 243555/243641 Email: stbcas@nic.in, stbcas@gmail.com, casmb-env@nic.in, caservis@gmail.com URL: casmbenvvis.nic.in	Mangroves, Estuaries, Lagoons, Coral Reefs
6.	Zoological Survey of India (ZSI)	Dr. K. Venkataraman, Director Dr. A. Chattopadhyay ENVIS Coordinator Prani Vigyan Bhawan, M Block, New Alipore, Kolkata-700053, West Bengal Phone: 033-24002360 (Extn.292) Coordinator: 09339382386 Fax: 033-24006893 Email: zsi@envis.nic.in, drachatto@yahoo.com URL: zsienvvis.nic.in	Faunal Bio diversity
7.	Centre for Mining Environment (CME)	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 URL: http://ismenvis.nic.in/	Environmental Problems of Mining
8.	National Environmental Engineering Research Institute (NEERI)	Shri Prakash Kumbhare, ENVIS Coordinator (9423063927, 0712-2249782) Nehru Marg, Nagpur-440020, Maharashtra Phone: 0712-2226026,2226071, 2249885 Fax: 0712-2225191, 2249782, 2249900 Email: neeri@envis.nic.in, ps_kumbhare@neeri.res.in URL: neerienvvis.nic.in	Hazardous Waste
9.	G.B. Pant Institute of Himalayan Environment and Development (GBPIHED)	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 Fax: 05962-241014/15, 241150, 241153 Email: gbpihed@envis.nic.in, himenvis@gbpihed.nic.in URL: gbpihed.nic.in	Himalayan Ecology

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
10.	Botanical Survey of India (BSI)	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, 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)	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)	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 URL: wiienvis.nic.in	Wildlife and Protected Area Management
13.	State Council of Science and Technology for Sikkim (SCSTS)	Shri A.K. Srivastava, IAS, Secretary, Dept. of Science & Technology Shri Dorji Thinlay Bhutia, ENVIS Coordinator Deorali, Gangtok-737 102, Sikkim 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	Eco-Tourism

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
14.	Central Arid Zone Research Institute (CAZRI)	Dr. M.M. Roy, Director Shri Tirth Das, ENVIS Coordinator Dr. Raheja Library, Jodhpur-342 003, Rajasthan Phone: 0291- 2788706 Coordinator: 09829586846 Tel.: 0291-2786584 Fax: 291-788706 Email: cazri@envis.nic.in, tdas@cazri.res.in URL: cazrienvis.nic.in	Desertification
15.	Department of Zoology - University of Madras	Col. Dr. G. Thiruvassagam (Vice-Chancellor) Prof. N. Munuswamy, Hon. Director and ENVIS Coordinator Life Science Building, Guindy Campus, Chennai-600 025, Tamil Nadu Phone: 044-22300899 Mobile: 09884171947 Fax: 044-22300899 Email: dzum@envis.nic.in, enviscoordinator@gmail.com, munuswamym@yahoo.com URL: dzumenvis.nic.in	Microorganisms and environmental management
16.	Institute for Ocean Management (IOM)	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)	Prof. B.N. Goswami, Director Dr. Gufran Beig , Scientist F & ENVIS Coordinator Dr. Homi Bhabha Road, Pashan, 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	Acid Rain and Atmospheric Pollution
18.	Indian Institute of Chemical Technology (IICT)	Dr. J.S. Yadav, Director Dr. U.Suryanarayana Murthy, ENVIS Coordinator Habsiguda, Uppal Road, Hyderabad-500 007, Andhra Pradesh Phone: 040-27193134 Fax: 040-27193227 Coordinator: +91-9440802794 Email: iict@envis.nic.in, usnmurthy@iict.res.in URL: iictenvis.nic.in	Bioinformatics - Vector Control

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
19.	Central Building Research Institute (CBRI)	Prof. S.K. Bhattacharya, Director Dr. L.P. Singh, ENVIS Coordinator Roorkee-247 667, Uttarakhand Phone: 01332-283442, 272391, 2722432 Mobile: 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)	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)	Shri Bharat P. Jain , Member Secretary Ms. Chinkal Patel, Coordinator Block No.4, 3rd Floor, Udyog Bhawan, Sector-11, Gandhi Nagar-382 017, Gujarat Phone: 079- 23244147 Fax: 079-23244306 Mobile: 09898876827 Email: gcpc@envis.nic.in, gcpc11@yahoo.com URL: gcpcgujarat.org/envis	Cleaner Production & Technology
22.	Department of Environmental Sciences (DES)	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 scsantra@yahoo.com,desku@envis.nic.in URL: deskuenvis.nic.in	Environmental Biotechnology
23.	School of Planning and Architecture (SPA)	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, spa@envis.nic.in, m.dhote@spa.ac.in URL: spaenvis.nic.in	Human Settlement

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
24.	School of Environmental Sciences Jawaharlal Nehru University (JNU)	Shri Sandeep Chatterjee, Registrar Prof. Sudha Bhattacharya, Dean, School of Environmental Sciences, JNU & ENVIS Coordinator Dr. Yadav (ENVIS In-charge, 9968077736) New Delhi-110 067, India Phone: 011-26704315 Fax: 26741502 Email: envis@mail.jnu.ac.in URL: jnuenvis.nic.in	Bio-geochemistry
25.	Environment Protection Training and Research Institute (EPTRI)	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
26.	International Institute for Population Sciences (IIPS)	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
27.	The Energy Resources Institute (TERI)	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

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
28.	World Wide Fund for Nature – India (WWF)	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
29.	Centre for Environment Education (CEE)	Shri Kartikeya V. Sarabhai, Director Ms Sarita Thakore, ENVIS Coordinator Nehru Foundation for Development, Taltej Tekra, Ahmedabad-380 054, Gujarat Phone: 079-26844795, 26858002-05, 26858011 Coordinator: 09879209214 Fax: 079-26858010 Email: cee@envis.nic.in, cee.envis@ceeindia.org, sarita.thakore@ceeindia.org, rajeswari.namagiri@ceeindia.org URL: greenteacher.org	Environmental Education
30.	Centre for Media Studies (CMS)	Dr. N. Baskara Rao , Chairman Mr Anand A Jha, ENVIS Coordinator (9582254615) Research House, B-34, Community Centre, Saket, New Delhi-110 017, Delhi Phone: 011-26851660, 26522255, 26522244 26856429 Fax: 011-26968282 Email: cms@envis.nic.in,cmsenvis@cmsindia.org URL: cmsenvis.nic.in	Communication and Electronic Media
31.	Bombay Natural History Society (BNHS)	Dr. Asad R. Rahmani , Director & ENVIS Coordinator Hornbill House, Dr. Salim Ali Chowk, Saheed Bhagat Singh Road, Mumbai-400 001, Maharashtra Phone: 022-22818967 Coordinator: 022-22821811 Fax: 022-22837615 Email: bnhs@envis.nic.in, envis@bnhs.org URL: bnhsenvis.nic.in	Avian Ecology

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
32.	Consumer Education and Research Centre (CERC)	Shri Kalyan Bose, Hon. Director (Admn.) Ms Gauri Wagenaar, ENVIS Coordinator (09825965263) 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
33.	CPR Environmental Education Centre (CPREEC)	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
34.	Foundation for Revitalization of Local Health Traditions (FRLHT)	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
35.	International Institute of Health and Hygiene	Dr. Namita Mathur, Head & ENVIS Coordinator Sulabh Bhawan, Mahavir Enclave, New Delhi-110 045 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)	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

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
37.	Salim Ali Centre for Ornithology and Natural History (SACON)	Dr. P.A. Azeez, Director Dr. Goldin Quadros, ENVIS Coordinator Anaikatty P.O., Coimbatore-641 108, Tamil Nadu Phone: 0422-2203130, (Reception)- 0422-2203100 /2203109, (Director): 0422-2203101, (Coordinator) - 0422-2203128, 09869183412 Email: sacon@envis.nic.in, salimalicentre@gmail.com, goldinq@yahoo.com URL: wetlandsofindia.org	Wetland Ecosystem (including inland wetlands)
38.	Indian Environmental Society (IES)	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
39.	Nagaland Institute of Health, Environment and Social Welfare (NIHESW)	Dr. Inakhe Sumi, Honorary Director and Senior Program Officer Mr. Vitsu Yhome, ENVIS Coordinator Opposite to Commissioner's Office, Old Secretariat Complex, Kohima-797 001, Nagaland Phone: 0370-2292086 Fax: 0370-2240626, 2245615, 2240180 Mob: +91-8974519317/+91-9402992786 Email: nag@envis.nic.in, nihesw@yahoo.com, vitsu84@yahoo.com URL: nagenvis.nic.in	Status of Environment and Related Issues
ENVIS Government Centres (State Government)			
40.	Environment Protection Training and Research Institute (EPTRI)	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

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
41.	Assam Science, Technology and Environmental Council	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
42.	Bihar State Pollution Control Board	Prof. Subhash Chandra Singh, Chairman (9771433445) Shri Rakesh Kumar, IFS, Member Secretary & 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	Shri P.V. Narsingh Rao, Member Secretary Shri A.P. Savant, ENVIS Coordinator (9685095435) Shri Hunkar Singh, Programme Officer (8656070712) Commercial Complex, Chhattisgarh Housing Board Colony, Kabir Nagar, Raipur-492 001, Chhattisgarh Phone: 0771-2443923, 24; 2425523 Fax: 0771-2443924, 2425585 Email: cht@envis.nic.in, hocecb@gmail.com URL: enviscecb.org/links.htm	Status of Environment and Related Issues
44.	Goa State Council of Science & Technology	Mr. Lewinson Martin, Member Secretary and Director GSCST Mob.: 08390908284, 0832-2438528F Shri Joseph D'Souza, Chief Scientist & ENVIS Coordinator (09623255354) Saligao Plateau, Saligao, Bardez-403 511, Goa Telefax: 0832-2407012 Email: josephste@rediffmail.com URL: goaenvis.nic.in	Status of Environment and Related Issues
45.	Gujarat Ecology Commission (GEC)	Shri C.H. Pandya, Director (09825030698) Shri Nischal Joshi, Sr. Project Manager/Coordinator Block No.18/1, Udyog Bhavan, Sector-11, Gandhinagar-382017, Gujarat Phone: 079-23257658, 23257659, (Coordinator: 09825021373) Fax: 079-23257656 Email: guj@envis.nic.in, gec_icef@rediffmail.com, nischal.joshi2@gmail.com URL: gujenvfor.gswan.gov.in	Status of Environment and Related Issues

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
46.	State Council for Science, Technology and Environment (SCSTE)	Shri E. Vikram, IFS, Jt. Member Secretary(EC) Dr. Alka Sharma, ENVIS Coordinator B-34, SDA Complex, Kasumpti, Shimla-171 009, Himachal Pradesh Phone: 0177-2621992,2620998, 2622923, 2633923, (Coordinator: 09816462200) Fax: 0177-2620998 Email: hp@envis.nic.in URL: hpenvis.nic.in	Status of Environment and Related Issues
47.	Directorate of Environment and Remote Sensing J&K	Shri Suresh Chugh, (IFS), Director Mrs. Mutaharra A W Deva, ENVIS Coordinator (09419015370) 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.	Forests & Environment Department, Govt. of Jharkhand	Shri A. K. Singhi IFS, Principal Chief Conservator of Forests, Shri Shashi Nandkeolyar, IFS - Conservator of Forests, Plantation Research and Evaluation and ENVIS Coordinator Forests & Environment Department Doranda, Ranchi-834 002, Jharkhand Phone: 0651- 2482294 Fax: 0651-2480655, (Coordinator: 09431364084) 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)	Shri R.M.N. Sahai, IFS, Director General Shiva Subramanya S, 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: 080-26490746/47, Coordinator: 9448059518 Fax: 080-26490745 Email: empri@envis.nic.in, empri.envis@gmail.com URL: parisaramahiti.kar.nic.in, karenvis.nic.in	Status of Environment and Related Issues

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
50.	Kerala State Council for Science, Technology and Environment (KSCSTE)	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: 0471-2548210/99, 2543701/05 Coordinator: 09447489587, 0471-2548213 Fax: 0471-2543558, 2540085 Email: ker@envis.nic.in, kscste@gmail.com, mailto@kscste.org drkokkal@yahoo.com, envkerala@gmail.com URL: kerenvis.nic.in	Status of Environment and Related Issues
51.	Disaster Management Institute (DMI)	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, Government of Maharashtra	Mrs. Valsa R. Nair Singh (IAS), Secretary (Environment Department), Government of Maharashtra Dr. B.N. Patil, ENVIS Coordinator (9869942395) New Administrative Building, 15th Floor, Madam Cama Marg, Mantralaya, Mumbai-400 032, Maharashtra Phone: 022-22854707, 22855082 Fax: 022-22025946, 22813947 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, Manipur	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 Coordinator: 09436035880, 09436038970 Fax: 0385-2227625, 2446670 Email: man@envis.nic.in, brajakumar_t@yahoo.com URL: manenvis.nic.in	Status of Environment and Related Issues

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
54.	Mizoram Pollution Control Board	RC. Thanga (IFS Rtd), Chairman, Mizoram Pollution Control Board C. Lalduhawma, Member Secretary & ENVIS Coordinator (0 919436142012) K Vanlalfamkima, Sr PO (09774217908, 9862809075) Ms. Elizabeth, Web Asstt. (09436192247) Silver House, Tuikhuahtlang, Aizwal-796 001, Mizoram Phone: 0389-2316591, 2326173, 231184, 09436142012 Fax: 0389-2316591, 2316590 Email: miz@envis.nic.in, mpcb_azl@yahoo.com URL: mizenvis.nic.in	Status of Environment and Related Issues
55.	Centre for Environmental Studies (CES)	Dr. Ms Sailabala Padhi, Director, Shri Pravat Mohan Dash, ENVIS Coordinator Forest & Environment Department, Government of Odisha, N-1/247, IRC Village, Nayapalli, Bhubaneswar-751 015, Odisha Phone: 0674-2551853, 2551853 Coordinator: 0 9438186037 Fax: 0674-2553182 Email: ori@envis.nic.in, cesorissa@rediffmail.com, pravatmohandash@gmail.com URL: orienvis.nic.in	Status of Environment and Related Issues
56.	Punjab State Council for Science and Technology (PSCST)	Ms. Neelima Jerath , Executive Director Shri Gurharminder Singh, ENVIS Coordinator MGSIPA Complex, Second Floor, Adj. Sacred Heart School, Sector-26, Chandigarh-160 019, Punjab Phone: 0172-2792325,2795001, 2793300, Ext. 140 Fax: 0172-2793143 Coordinator: 09815655801 Email: pun@envis.nic.in, harminder1978@gmail.com, neelimajerath@pscst.com, ravleenmarwah@gmail.com URL: punenvis.nic.in	Status of Environment and Related Issues
57.	Rajasthan State Pollution Control Board	Dr. V. S. Singh, Chairman Shri Ashok Puri, Sr. Environmental Engineer and ENVIS Coordinator (9413340882, 9667575991) 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 dnpandey@gmail.com, singhalvijai@gmail.com URL: rajenvis.nic.in	Status of Environment and Related Issues

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
58.	Forests, Environment & Wildlife Management Department, Sikkim	Shri. Arvind Kumar, IFS PCCF-cum-Addl Chief Secretary Shri. B. K. Tewari, IFS Conservator of Forests (Environment) 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, Coordinator: 09434109635 Fax: 03592-281778 Email: sik@envis.nic.in URL: sikenvis.nic.in	Status of Environment and Related Issues
59.	Department of Environment, Tamil Nadu	Dr. H. Malleshappa, 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@tn.nic.in URL: tnenvis.nic.in	Status of Environment and Related Issues
60.	Tripura State Pollution Control Board	Prof. Mihir Deb, Chairman Shri Manas Mukherjee, ENVIS Coordinator Parivesh Bhawan, Pandit Nehru Complex, Gorkhabasti, P.O. Kunjaban, Agartala-799 006, Tripura Phone: 0381-2322462, 2306233, Coordinator: 09436122197 Fax: 0381-2322455 Email: mukherjee_manas@rediffmail.com, trippcb@sancharnet.in, trp@envis.nic.in, tripuraenvis@rediffmail.com URL: trpenvis.nic.in	Status of Environment and Related Issues
61.	Directorate of Environment - Uttar Pradesh	Shri O.P. Verma, Director(I/C) Shri R.K. Sardana, Jt.Director-cum-Chief Appraisal and 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, vikascagrawal@yahoo.com URL: upenvis.nic.in	Status of Environment and Related Issues

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
62.	Uttarakhand Environment Protection & Pollution Control Board (UEPPCB)	Mr. Jai Raj, Member Secretary Shri Amarjeet Singh Oberai, ENVIS Coordinator E-115, Nehru Colony, Hardwar Road, Dehradun-248011, Uttarakhand Phone: 0135-2668922, Coordinator: 09412085568 Fax: 0135-2668092 Email: ms.ueppcb@gmail.com, utr@envis.nic.in, asoberai@yahoo.com URL: utrenvis.nic.in	Status of Environment and Related Issues
63.	Department of Environment and Forest - Andaman and Nicobar	Shri D. V. Negi, PCCF Shri S.H.K Murti, DCF (Planning & Monitoring) & ENVIS Coordinator (03192-244664, WLL No. 03192200995, murtigis@hotmail.com) 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, pccfani@gmail.com, apccfpd2010@gmail.com URL: as.and.nic.in/envis	Status of Environment and Related Issues
64.	Forest Department (Wildlife Division), Union Territories of Dadra & Nagar Haveli and Daman & Diu	Shri Richard D'Souza, Chairman Dr. N. Palanikanth (07567676668, vetpalani@gmail.com) Deputy Conservator of Forests (WL) / ENVIS 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
65.	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

S. No.	Name	Communication Linkage (Head of Organisation/ Coordinator/Address)	Subject Area
66.	Puducherry Pollution Control Committee	M. Dwarakanath, Director, Department of Science, Technology & Environment Dr. N. Ramesh, ENVIS Coordinator Illrd Floor, Pondicherry Housing Board Building, Anna Nagar, Puducherry-605 005, Puducherry Phone: 0413-2201256, Mobile: 0 9443329141 Fax: 0413-2203494 Email: pon@envis.nic.in, envis.pon@nic.in, dste.pon@nic.in URL: dstepuducherry.gov.in/envis1.htm	Status of Environment and Related Issues

Performance Evaluation Report of RFD for 2011-12

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement		Performance	
						Excellent	Very Good	Fair	Poor	Raw Score	Weighted Score			
1 Afforestation and Regeneration of Degraded Forests	16.00	(b) Mainstreaming livelihood issues with afforestation programmes	Employment generation number of man-days generated	Number (million man-days)	6.40	22	18	15	12	9	18	90.0	5.76	
						28	22	20	18	16	26	96.67	4.64	
						0.55	0.47	0.42	0.37	0.30	1.39528	100.0	3.2	
		(a) Approval of State FDA proposals for regeneration of degraded forests	(i) Approval of State FDA proposals within 45 days of receipt.	Number	4.80	30/06/2011	31/08/2011	31/10/2011	31/12/2011	29/02/2012	30/06/2011	100.0	0.64	
						31/12/2011	29/02/2012	31/03/2012		31/12/2011	100.0	0.64		
						31/01/2012	29/02/2012	15/03/2012						
		(c) Organisational setup for Implementation of Green India Mission	(ii) Extent of treatment area for which NAP projects approved	lakh Ha	3.20	30/06/2011	31/08/2011	31/10/2011	31/12/2011	29/02/2012	30/06/2011	100.0	0.64	
						31/12/2011	31/01/2012	29/02/2012	31/03/2012		31/12/2011	100.0	0.64	
						31/01/2012	29/02/2012	15/03/2012	30/03/2012					
		(d) Plan of action for Implementation of the Green India Mission	(i) Planning manual and operational guidelines	Date	0.64	30/06/2011	31/08/2011	31/10/2011	31/12/2011	29/02/2012	30/06/2011	100.0	0.64	
						31/12/2011	31/01/2012	29/02/2012	31/03/2012		31/12/2011	100.0	0.64	
						31/01/2012	29/02/2012	15/03/2012	30/03/2012					
2. Protection of Forests	7.00	Strengthening of forest protection and management in States/UTs by providing financial assistance	(ii) One year bridging plan for the year 2011-12	Date	0.32	30/06/2011	31/08/2011	31/10/2011	31/12/2011	29/02/2012	30/06/2011	100.0	2.1	
						31/12/2011	31/01/2012	29/02/2012	31/03/2012		31/12/2011	100.0	2.1	
						31/01/2012	29/02/2012	15/03/2012	30/03/2012					
			(i) Number of proposals approved within 60 days of receipt.	Number	2.10	30	25	23	20	18	49	100.0	2.1	
			(ii) Utilisation of budget allocation	%	2.10	95	85	80	75	70	98	100.0	2.1	
			Number of SFDA supported	Number	2.80	26	24	22	20	18	N/A	N/A	N/A	

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement	Performance	
						Excellent	Very Good	Fair	Poor	Raw Score		Weighted Score	
3	10.00	(a) Treatment of municipal sewage falling into the rivers (b) Pollution abatement works/ rejuvenation of lakes	Creation of sewage treatment capacity Number of lakes where rejuvenation works to be completed	mid Number	7.50 2.50	300 5	270 4	240 3	210 2	180 1	241 4	80.33 90.0	6.02 2.25
4	12.00	In situ and Ex-situ Conservation of Fauna and Flora	Number of protected areas including tiger reserves and elephant reserves provided financial assistance (a) In situ Conservation: Strengthening of infrastructure in protected areas including tiger reserves and elephant reserves provided financial assistance (b) In Ex-situ Conservation:	number	8.00	400	375	360	350	340	422	100.0	8.0
		To provide financial assistance to zoos for improved infrastructure for conservation of animals	Number of zoos provided financial assistance	number	4.00	36	32	30	28	26	34	95.0	3.8
5	5.00	(a) To provide financial assistance to 12 existing botanic gardens and to two Lead Botanic Gardens (b) To ensure ex-situ conservation of at least 100 RET and endemic species	Financial assistance provided to existing botanic gardens and lead botanic gardens Ex-situ conservation of RET and endemic species	number number	2.50 2.50	14 100	12 80	10 70	8 60	6 50	6 250	60.0 100.0	1.5 2.5
6	4.00	(a) To provide financial assistance to eco-clubs in schools under the National Green Corps Programme	Number of eco-clubs in NGC schools financially assisted	Number	2.00	90000	80000	70000	60000	50000	100298	100.0	2.0
		Participation in the Protection of Environme	Green Corps Programme										

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement	Performance	
						Excellent	Very Good	Fair	Poor	Raw Score		Weighted Score	
		(b) To provide financial assistance to NGOs, educational and other institutions under the National Environment Awareness Campaign	Number of local level NGOs, educational and other institutions financially assisted	Number	1.00	9000	8000	7000	6000	5000	14297	100.0	1.0
		(c) Advertising & Publicity for awareness generation	Number of TV episodes and spots produced for media campaign	Number	1.00	25	20	15	12	10	15	80.0	0.8
7	2.00	Sanctioning and release of grants for ongoing projects in 13 identified thematic areas.	Release of grants to all ongoing projects within 45 days of receipt of proposal	number	2.00	65	60	55	50	45	65	100.0	2.0
8	3.00	(a) Survey of forest ecosystems, protected areas and fragile ecosystems	Extent of coverage of forest region/state/district/ecosystem/ protected areas	Number of field surveys conducted	2.40	55	50	45	40	38	71	100.0	2.4
		(b) Digitization of herbarium specimens	Digital Images and Metadata	Number of specimens digitized	0.60	9500	9000	8500	8000	7500	5783	0.0	0.0
9	3.00	(a) Survey of forest ecosystems, protected areas and fragile ecosystems	Extent of coverage of forest region/state/district/ecosystem/protected areas	Number of field surveys conducted	2.40	90	85	80	75	70	103	100.0	2.4
		(b) Digitization of national zoological collections	Digital Images and Metadata	Number of specimens digitized	0.60	4600	4200	4000	3800	3500	9200	100.0	0.6
10	5.00	(a) Enhancement of common effluent treatment capacity	MLD value created	Mld	1.00	135	121	108	94	81	100	74.29	0.74

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement		Performance	
						Excellent	Very Good	Fair	Poor	Raw Score	Weighted Score			
		(b) Notification of standards for additional categories of industries	New Industrial categories to be covered	Number	1.00	6	5	4	3	2	6	100.0	1.0	
		(c) Expanding the network of water quality monitoring stations	Additional water quality monitoring stations commissioned	Number	1.00	500	450	400	350	300	400	80.0	0.8	
		(d) Expanding the network of air quality monitoring stations (NAMMP)	Additional air quality monitoring stations commissioned	number	1.00	50	40	30	20	10	64	100.0	1.0	
		(e) Expanding the network of noise level monitoring stations (NANMP)	Additional noise level monitoring stations commissioned	number	1.00	25	20	15	12	10	25	100.0	1.0	
11	8.00	(a) Setting up of one treatment, storage and disposal facilities for hazardous waste & two bio-medical wastes treatment and Disposal Facilities	(i) Finalization of empanelment of independent agency for evaluation of DPRs.	Date	0.40	30/06/2011	31/07/2011	31/08/2011	30/09/2011	31/10/2012	30/06/2011	100.0	0.4	
			(ii) Inviting proposals from states	Date	0.40	30/06/2011	31/07/2011	31/08/2011	30/09/2011	31/10/2012	30/06/2011	100.0	0.4	
			(iii) Receipt and evaluation of proposals	Date	0.80	31/08/2011	30/09/2011	31/10/2011	30/11/2011	31/12/2011	31/08/2011	100.0	0.8	
			(iv) Release of financial assistance	Date	0.40	28/02/2012	10/03/2012	15/03/2012	20/03/2012	25/03/2012	28/02/2012	100.0	0.4	
		(b) Implementation of GIS based inventurisation system for hazardous wastes	To have GPS for 5000 industries in different States	Number	2.00	5000	4000	3000	2000	1000	5000	100.0	2.0	
		(c) Physical Monitoring of hazard analysis and off-site emergency plan	Review of draft reports	Number	2.00	10	8	6	4	2	10	100.0	2.0	

	Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement		Performance	
							Excellent	Very Good	Fair	Poor	Raw Score	Weighted Score			
			(d) Creating public awareness	Organized workshops/seminars on chemical accidents management and wastes management	Number	2.00	10	9	8	7	6	10	100.0	2.0	
12	Better Environmental Governance	5.00	Introduction of the Environment Protection (Amendment) Bill in the Parliament for environmental regulatory reforms including establishment of National Environment Assessment and Monitoring Authority (NEAMA)	(i)Preparation of Draft Cabinet Note for establishment of	Date	2.00	15/06/2011	15/08/2011	15/10/2011	15/12/2011	15/02/2012	28/06/2011	97.87	1.96	
				(iv) Draft Environment Protection (Amendment) Bill	Date	1.00	15/08/2011	15/10/2011	15/12/2011	15/02/2012	15/03/2012		N/A	N/A	
				(ii)Clearance of the Bill by the Union Cabinet	Date	1.00	31/10/2011	15/12/2011	31/01/2012	31/03/2012			N/A	N/A	
				(iii) Introduction of the Bill in the Parliament	Date	1.00	01/12/2011	01/03/2012	15/03/2012	31/03/2012			N/A	N/A	
13	Implement National Action Plan on Climate Change through eight Missions and Specific Initiatives	5.00	Monitoring of the preparation and implementation of National Missions	(a) Meeting of Coordination Committee	Number	5.00	2	1				2	100.0	5.0	
	* Efficient Functioning of the RFD System	3.00	Timely submission of Draft for Approval	On-time submission	Date	2.0	07/03/2011	08/03/2011	09/03/2011	10/03/2011	11/03/2011	07/03/2011	100.0	2.0	
			Timely submission of Results	On-time submission	Date	1.0	01/05/2012	03/05/2012	04/05/2012	05/05/2012	06/05/2012	01/05/2012	100.0	1.0	

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement	Performance	
						Excellent	Very Good	Fair	Poor	Raw Score		Weighted Score	
* Improving Internal Efficiency / Responsiveness / Service delivery of Ministry / Department	10.00	Implementation of Sevottam	Resubmission of revised draft of Citizens' / Clients' Charter	Date	2.0	16/01/2012	18/01/2012	20/01/2012	23/01/2012	25/01/2012	09/02/2012	0.0	0.0
			Independent Audit of Grievance Redress Mechanism	%	2.0	100	90	80	70	60	49.05	0.0	0.0
		Ensure compliance with Section 4(1) (b) of the RTI Act, 2005	No. of items on which information is uploaded by February 10, 2012	No	2.0	16	15	14	13	12		N/A	N/A
		Identify potential areas of corruption related to departmental activities and develop an action plan to mitigate them	Finalize an action plan to mitigate potential areas of corruption.	Date	2.0	26/03/2012	27/03/2012	28/03/2012	29/03/2012	30/03/2012	10/02/2012	100.0	2.0
		Develop an action plan to implement ISO 9001 certification	Finalize an action plan to implement ISO 9001 certification	Date	2.0	16/04/2012	17/04/2012	18/04/2012	19/04/2012	20/04/2012	16/04/2012	100.0	2.0

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value Achievement Performance					Achievement		Performance	
						Excellent	Very Good	Fair	Poor	Raw Score	Weighted Score			
* Ensuring compliance to the Financial Accountability Framework	2.00	Timely submission of ATNS on Audit Paras of C&AG	Percentage of ATNS submitted within due date (4 months) from date of presentation of Report to Parliament by CAG during the year.	%	0.5	100	90	80	70	60	100	100.0	0.5	
		Timely submission of ATRs to the PAC Sectt. on PAC Reports.	Percentage of ATRs submitted within due date (6 months) from date of presentation of Report to Parliament by PAC during the year.	%	0.5	100	90	80	70	60	100	100.0	0.5	
		Early disposal of pending ATNS on Audit Paras of C&AG Reports presented to Parliament before 31.3.2011.	Percentage of outstanding ATNS disposed off during the year.	%	0.5	100	90	80	70	60	100	100.0	0.5	
		Early disposal of pending ATRs on PAC Reports presented to Parliament before 31.3.2011	Percentage of outstanding ATRs disposed off during the year.	%	0.5	100	90	80	70	60	100	100.0	0.5	

* Mandatory Objective(s)

