

**CHAPTER II (A)**  
**REVIEW OF OVERALL PERFORMANCE DURING 1992-93**

**FORESTRY AND WILDLIFE**

**FORESTRY EDUCATION AND TRAINING**

**I. INDIRA GANDHI NATIONAL FOREST ACADEMY DEHRADUN**

- 66 IFS probationers and 2 foreign trainees from Bhutan completed their training Course of 1991—93 batch.
- 55 IFS probationers of 1992—94 batch joined the academy during the year.

**II. STATE FOREST SERVICE AND RANGERS COLLEGES**

- 37 State Forest Service officers joined the two years training course for 1999-94 batch.
- Trainees of 1990—92 batch passed out the training course.
- 43 Rangers joined the two years training course for 92—94 batch.
- 93 Rangers of 1991—93 batch completed their training course.

**III. INDIAN INSTITUTE OF FOREST MANAGEMENT, BHOPAL**

- 23 Students were admitted in 1992—94 batch of Post-Graduate programme in forest management.
- 27 students of 1990- 92 batch completed the course of postgraduate programme in Forest Management.
- 8 Management Development programme/ courses were organised.
- 27 case studies, technical notes and research papers were proposed. Some of them were completed and some projects are being continued.
- An amount of Rs. 13.48 lakhs s incurred for procurement of 1647 books and 276 journals.

**FORESTRY RESEARCH**

**I. INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION (ICFRE)**

The achievement of six research institutes and three centres were as under:

**(i) FOREST RESEARCH INSTITUTE, DEHRADUN**

1. Nursery and planting technology has been developed for Melocanna bambusoides.
2. For soil amelioration studies on use of mulch techniques for degraded and eroded lands has been conducted.
3. Calorific values of some shrubs were studied.

4. Growth performance studies of *Grevillea robusta*, Bombay, *ceiba*, *Acacia nilotica*, *Terminalia arjuna*, *Dalbergia sissoo* and *Tectona grandis* were carried out.
5. Studies to evaluate suitability of wood of tree species, *sissoo*, *A. nilotica*, and *eucalyptus* for production of lignosulphonates on pilot scale.
6. Kraft sulphite pulps were prepared using, anthraquinone (AQ) as catalyst and bleached pulps were evaluated for various strength properties.
7. Various varieties of papers manufactured from waste paper were studied for strength properties etc.
8. Loss of tree seeds due to insect attack was studied in 18 tree species.
9. Provenance trials of *A. nilotica* were initiated.
10. Physical and mechanical properties of *Mali azadirach*, *Quercus serrata* and *Michella champaca* were studied.
11. Studies on effect of tree age on strength properties of *E. Hybrid* was completed
12. Wirebound fruit packing boxes with improved joints were developed.
13. Designing and standardisation of plant carrier and seed Dibble was initiated and the work was in progress.
14. Six permanent and four temporary sample plots of poplar, *Acacia tortilis* and *Proposals juliflora* were laid out for data collection.
15. Impact of lopping on growth of *acacia nilotica* in Haryana was studied.

**(ii) INSTITUTE OF FOREST GENTICS AND TREE BREEDING, COIMBATOTRE**

1. Vegetative propagation of planting stock from candidate plus tree was collected for genetic upgrading of *casuarina equisetifolia*.
2. Rooting studies on *A. nilotica*, *P. pinnata* and *gliricidia sepium* have been initiated for standardisation of vegetative propagation technique. Clonal multiplication of teak initiated.
3. Germination capacity of seeds of *Tamarindus indica*, *Azadirachta indica* was studied.
4. Plots for plant succession study in degraded forests of western ghats were laid out and data recording undertaken.
5. Study of soil samples from *Acacia plant-formis* plantation plots to determine the recycling, of nutrients.
6. Data collection was undertaken to work out the economics of cultivation and marketing of *casuarina* in south India.

**(iii) INSTITUTE OF WOOD SCIENCE AND TECHNOLOGY, BANGALORE**

1. Studies of physical and mechanical properties of *pterocarpus angolensis* and its suitability for furniture making.
2. Delignification of mixed saw dust by enzymatic hydrolysis was studied.
3. Mushroom cultivation on a compost using sawdust was studied.
4. Evaluation of dimensional movement in *Acacia nilotica* and *Hevea brasiliensis*.

5. Ten villages from the states of Karnataka and Andhra Pradesh identified, for demonstration with improved stock of multipurpose tree species for planting.

(iv) **TROPICAL FOREST RESEARCH INSTITUTE, JABALPUR**

1. Fertilizer trails on *Albizia procera* at nursery and *Dalbergia sissoo* in plantations carried out.
2. Studies on chemical control of diseases of medicinal plants.
3. Biological control of some diseases of forest trees using Marigold leaves extract.
4. 3 new species of seedborers recorded, the biology and life cycle of *Albizia* seed borers in immature seeds were studied.
5. Efficiency of biopesticides against teak skeletonizer was studied.
6. Survey done to know the species preference for agroforestry planting in villages of Vindhyan and Satpura agroclimatic zone.
7. Edible rhizomes like *Dioscoria*, *Impomea colocaria* etc. were collected for propagation and assessment of their nutritive value as food (These are used as food by some tribes.)

(v) **INSTITUTE OF ARID ZONE FORESTAY RESEARCH, JODHPUR**

1. Effect of chemical fertilizers on growth of some tree species in the nursery.
2. Survey of superior germplasm of *Anogeissus pendula* for clonal propagation and Improvement by selection.
3. Survey and evaluation of termite and other pests attack on Neem.

(vi) **INSTITUTE OF RAIN AND MOIST DECIDUOUS FOREST RESEARCH, JORHAT**

1. Continuing of studies of flora of Jorhat district identification of 20 specimens was completed.
2. Energy content of some bamboo species determined, study of effect of shifting cultivation on the vegetation microbial population and soil nutrients in North East India; Physico-chemical properties and microbial population of collected soil were determined. Successional pattern of vegetation in moderate type of climate was documented.
3. Insect pests of Gamhar (*Gmelina arborea*) were recorded. Studies on the microbial pathology is in progress.
4. Studies on mycorrhizal association in the forests of NE India initiated VAM spores from the rhizosphere soil and root samples of some forest tree species were recorded.
5. For micro and macro propagation from nodal explant from newly sprouting *Bambusatulda* was initiated.

(vii) **TEMPERATE FOREST RESEARCH CENTRE SHIMLA**

1. Studies on development of nursery technology for silver fir and spruce continued.
2. Studies on nutrients cycling in conifer forests of Western Himalayas.
3. Studies and development of afforestation technology for cold desert areas

**(viii) CENTRE FOR FOREST PRODUCTIVITY, RANCHI**

1. Demonstration of improved methods of lac cultivation and brood lac produced.
2. Studies on the productivity of agro-forestry species of the zone.
3. Studies on lac cultivation on some more forest species.

**(viii) CENTRE FOR SOCIAL FORESTRY AND ECO- REHABILITATION, ALLAHABAD**

1. Studies on eco rehabilitation of alkaline and degraded soils.
2. Demonstration of agro forestry modules with superior clones and selection of suitable species of trees and bamboos.

**II. INDIAN PLYWOOD INDUSTRIES RESEARCH AN'D TRAINING INSTITUTE (IPIRTI), BANGALORE**

- Research work on 42 ongoing R&D projects was continued. 9 projects were completed. 2 projects were terminated and 4 new projects were added.
- 6 vocational training courses in the areas such as timber grading, saw doctor ng, saw-milling, slicing etc., were conducted and 34 candidates were trained.
- 22 candidates successfully completed certificate course in Mech. wood industries technology.
- Tests for conformity to relevant Indian standards were carried out on 869 samples.
- 30 process improvement demonstrations were conducted in various factories.
- National workshop on Bamboo Mat Board was organised on 12-2 1993 in which 82 delegates participated.

**SURVEY AND UTILISATION OF FOREST RESOURCES**

A Policy Adviser Group (PAG) was set up in this Ministry with an objective to make efficient utilisation of fuel wood vis-a-vis conservation of fuelwood and exploring ways and means for fuelwood substitution. The PAG in its 2nd meeting held on 18-9-522 made the following recommendations:

1. Steps may be taken to popularise improved chullahs with due regard to design and acceptability in each area. There should be follow up of chullah supply programme in each area for at least a period of two years.
2. Gobar gas plants should be promoted with more vigour and the possibility of using human waste to produce bio-gas should be explored.
3. The programme of improved crematoria on the line of Guiarat should be popularised.
4. In order to reduce consumption of fuelwood in hilly areas, a scheme for supply of press sure cookers on subsidised rates be taken up.
5. The technique of wooden boxes filled with straw for cooking partially cooked foods should be popularised.

6. Intensive efforts should be made to popularise solar cookers and solar heaters through supplies at subsidised costs.
7. Possibility of generating power from wind mills and its use for cooking in Dabhas should be explored.

Follow up action on the recommendations of PAG was taken and for this purpose, all Chief Secretaries of State Governments were informed to take steps for locating wood substitution.

### **FOREST SURVEY OF INDIA**

Forest Survey of India (FSI) carries out comprehensive forest resources survey at regular intervals and prints information in a suitable form for planning at national, state and local levels including evaluation through reinventory to facilitate scientific forestry planning. The achievements of FSI during 1992-93 were as under:

Sl. No.	Items of work	Unit	Achievements
1	Forest Inventory	Forest area in Sq. km	3,348
2	Data Processing	- do -	24, 282
3	Thematic mapping	Sheets of 1:50,000	102
4	Vegetation mapping	Sheets of 1:250,000	48
5	Training	Persons trained	39

### **FOREST CONSERVATION**

The number of Forest Conservation and Environmental Management cases monitored by Regional offices were as under:

Sl. No.	Name of Regional Office	Number of Forest conservation cases mentioned	Number of Environmental Management cases monitored
1	Bangalore	147	115
2	Bhopal	103	60
3	Bhubaneshwar	129	91
4	Lucknow	176	89
5	Shillong	120	91
6	Chandigarh	74	36
	Total	749	482

### **FOREST PROTECTION AND REGENERATION**

The scheme “Development of infrastructure for protection of forest from biotic interference” was transferred to State Governments as per the decision of National Development Council. An amount of Rs. 295 lakhs was accordingly released to State Governments as per the guidelines of the Planning Commission.

Under the scheme “Introduction of Modern Forest Fire Control Methods in India” assistance of Rs. 74.28 lakhs was provided to 11 states.

Under the scheme “Association of Scheduled tribes and rural poor in regeneration of degraded forests on usufructs sharing basis” amount of Rs. 1.09 crores was released to the states of M.P., Bihar, Rajasthan and Andhra Pradesh.

## FOREST POLICY

With the announcement of new National Forest Policy 1988 it became necessary to orient all on-going forestry programmes to meet the objectives set by it. For preparation of National Forestry Action Programmes, PFF document was posed to Department of Economic Affairs for UNDP assistance.

## NATIONAL AFFORESTATION AND ECO-DEVELOPMENT BOARD (NAEB)

### 1. 20-POINT PROGRAMME

The National Afforestation and Eco-Development Board (NAEB) is the nodal agency at the Central level for point No. 16 (Afforestation, Tree planting) of the 20-Point Programme and it sets and monitors the overall national targets for afforestation/tree planting in consultation with the State Governments who are the main implementing agencies. The targets and achievements under point No. 16 of the 20 Point Programme during 1992-93 are as following:

	Seedlings distribution (in crores)	Area (in million ha)
Targets	145	1.064
Achievements	124	1.062

## SCHEMES/ACTIVITIES:

### 2A. Schemes- wise Progress

The NAEB is responsible for implementing 6 Central Sector/Centrally Sponsored Schemes. The progress of these Schemes during the year 1992-93 is as follows:—

S. No	Scheme/Activity	Physical Targets For 1992-93	Physical Achievement for 1992-93
1	Integrated Afforestation and Eco-Development Projects Scheme	60,000 ha	54,087 ha
2	Fuelwood/Fodder Projects Scheme.	42,000 ha	82,227 ha
3	Raising of Minor Forest Produce	16,155 ha	16,155 ha

	including Medicinal Plants Scheme		
4	Seed Development Scheme	23 States to be assisted	23 States to be assisted
5	Aerial Seeding Scheme.	28,900 ha.	27,320 ha.
6	Grants-in-Aid Scheme (for 40Projects 34 Projects Voluntary Agencies).	40 Projects	34 Projects

## WILD LIFE

The Scheme “Strengthening of Wildlife Division and Consultancies for Special Tasks” started from the year 1986, with activities like strengthening of Wild-life Division and setting up of Regional Offices with adequate manpower and development of infrastructure for better enforcement of Wildlife (Protection) Act, CITES etc. During the year, assistance of Rs. 30, 000 was given to Dr. Prakash Gole for study and survey of black necked crane, Rs. 2.50 lakh was released to government of Rajasthan for experiments on juvenite Sibes at Bharatpur, Rs. 70,000 was given as Grant-in-aid to Ecological Society for participation in an experiment for artificially hatched siberian crane at Russia. The consultancies namely Genetics study of wild Buffaloes and Studies on rusty - spotted cat were sanctioned. ET&T Corporation which. is wholly wholly owned central government corporation was given responsibly of copy right and produce copies of some of the films on wildlife for wider dissemination and circulation.

The International Symposium on Tiger was held at New Delhi during February 1993 to commemorate the completion of 20 years of Project Tiger and the deliberations of the said symposium culminated in the Delhi declaration on tiger conservation.

The achievements of various centrally sponsored schemes on wildwife preservation were as under:

	Scheme	Achievements (No. assisted)
1	Assistance for development of National Parks & Sanctuaries.	230 National Parks & Sanctuaries.
2	Project Tiger	19 Tiger Reserves
3	Eco-Development in and Around National Parks/Sanctuaries	54 Protected areas
4	Project Elephant	11 States.

## CENTRAL ZOO AUTHORITY

Para 32 H of the Wildlife (Protection) Act provides that no zoo shall be operated without being recognised by the authority. Accordingly application from was devised and sent to all Chief Wildlife Wardens, Directors of Zoos asking them to apply for recognition o f Z00(s) under their administrative control. Advertisements in the leading national daily newspapers were also given bringing the provisions of the Wildlife Act to the notice of the zoos being maintained by corporations, individuals etc. 143 zoos applied for recognition during the year. Recognition of

zoo rules were notification in 8/92. These inter alia contain (a) application form for recognition (b) classification of zoos and (c) standards and norms subject to which recognition to zoos shall be granted.

The total grant-in-aid received during 1992-93 from the Ministry of Environment and Forests was Rs. 75 lacs. Out of these Rs. 72.85 lacs was given to 17 zoos

### **ANIMAL WELFARE BOARD**

S. No	Name of Scheme	No. of Organisation benefitted
1	Setting up of rescue homes and animals shelter.	50
2	Setting up of Neutering Centre for stray dogs.	25
3	Aid to mobile clinics	20
4	Veterinary dispensaries	50
5	Development of grazing grounds	

### **NATIONAL ZOOLOGICAL PARK**

S. No	Targets	Achievement
1	Providing drainage to Wild Ass enclosures	Completed
2	Fixing steel gate for African Rhino.	Completed
3	Construction of stone masonry compound wall for African Rhino enclosure east and west ends.	Completed
4	Raising level of moat of Eland enclosure	Completed
5	Development of newly constructed sub station including its boundary	Completed

### **WILDLIFE INSTITUTE OF INDIA**

S. No	Courses	No. of persons trained
1	M Sc. course in Biology	7
2	Post-Graduate Diploma in Wildlife Management	19
3	Certificate course in Wildlife Management	17
4	Field Workshop/Short Courses	7

## **ECOLOGY AND ENVIRONMENT**

### **BOTANICAL SURVEY OF INDIA**

#### Exploration & Survey

15 tours were undertaken for survey & exploration in Bihar, West Bengal, Andaman & Nicobar, Port Blair, Arunachal Pradesh, Sikkim and Southern Western Ghats. No tour could be undertaken to Mizoram and Nagaland due to local disturbances. Taxonomic Studies.

15 per cent work on identification, nomenclature citation, preparation of key to the genera and species and writing up of description for the Floras has been completed as against the target of 17.20 per cent State Flora Analysis of Arunachal Pradesh, Sikkim and Himalaya, which are priority areas, is under preparation.

Some of the areas of North Eastern region of Jammu & Kashmir could not be explored due to local disturbances.

#### Endangered species

95 Red Data Sheets of endangered species of Indian plants were compiled and edited as against the target of 200 Nos. The short fall was because of the fact that some Red Data Sheets required consultation of literature in Library and examination of the Sheet in the Herbarium due to their changed nomenclature and circumscription.

#### Flora of India

Revisionary studies of the genera *Pedilanthus* and *Cynodenum* were completed and revision of 96 species of the families—Rhizophoraceae, Hamamelidaceae, Callitricaceae, Drisericaceae, and Leguminosae Papilionoideae (in part) and Verbenaceae were completed.

Manuscript on Phytogeography of Andaman & Nicobar Islands, South Western Ghats, Southern West Coast and writing up of the chapter on history of Botany in India were completed.

#### Useful Plants

Compilation and evaluation information on 5 useful plants of India has been completed.

#### National Data Base

Enumeration of 650 Type specimens of Indian plants available in various herbaria of BSI and other centres of India has been done. Listing of 500 live collections of BSI and other Botanic Gardens of India has been completed.

#### Mangroves

Editing of manuscripts of mangroves of India has been completed.

### Ethno-botanical Study

Compilation of information in respect of Bankura district has been completed and manuscript is being edited for publication. As regards Purulia, the study is proposed to be undertaken within March, 94.

### Geo-botanical studies

Geobotany of some selected areas of Singhum district (Bihar) has been done.

### Publication

Against the target of printing 13 publications, 9 publications were published and released and the rest are in the Press.

## ZOOLOGICAL SURVEY OF INDIA

### 1. Exploration and Survey

A total of 80 surveys were carried out in 9 states and Union Territories, namely, Himachal Pradesh, Uttar Pradesh, Bihar, Madhya Pradesh, Gujarat, Karnataka, Kerala, Tamilnadu and Andaman & Nicobar islands, covering 44 districts.

Besides these, different ecosystems and conservation areas were also surveyed during the year.

- (i) Himalayan Ecosystem: Surveys were conducted in Himachal Pradesh, Sikkim and Arunachal Pradesh.
- (ii) Tropical Rainforest Ecosystem: Surveys were undertaken in Tripura, Manipur and Western Ghats (Kerala and Goa).
- (iii) Desert Ecosystem: Parts of Gujarat State were surveyed.
- (iv) Wetland Ecosystem: Surveys were carried out in Loktak lake (Manipur), Kolleru lake and Mahanadi estuary (Andhra Pradesh), Ujni Wetland (Maharashtra), Coastal areas of Gujarat and Sundarbans (West Bengal).
- (v) Survey of Conservation areas: Surveys were conducted in Kanha National Park (UP), Nagarjun Sagar and Renuka sanctuary (Andhra Pradesh) and Agasthamalai Tiger Reserve (Tamilnadu).
- (vi) Impact Assessment Surveys were conducted for environmental impact assessment of Tehri Dam.

II. Status Survey of Endangered species: Two surveys were conducted in Tripura to assess the status of capped Langur and Hoolock Gibbon.

### III. Taxonomic studies:

1	Meghalaya	Collection of Protozoa, Coleoptera, diptera, oribatid mites, earth worms, prawns and crabs were identified.
2	Tripura	Studies were made on Ixodid ticks
3	Sikkim	Earth worms and leeches from the state identified
4	Tamil Nadu	Collections of Lepidoptera, diptera, homoptera, millipedes fishes and snakes identified
5	Gujarat	Studies were made on Sipuncula, Polychaetes, Coleoptera, Plant mites, amphibia and mammals

### IV. Publications:

A total of 211 scientific papers were written by the Scientists of this department, dealing with various aspects of Indian fauna. These were either published or sent for publication.

The following publications were brought out during the year:

1. Records of the Zoological Survey of India, Occasional papers Nos. 114.
2. Fauna of India: Laral Trematodes of India Pt. II.
3. Estuarine Ecosystem Series: Pt I Rushikulay estuary, Orissa.
4. State Fauna: of West Bengal Pt. 1 to 3.
5. Fauna of Tiger Reserves: An overview.
6. Butterflies and Moths in Indian Tiger Reserves.
7. Bibliography of Indian Zoology Vol. 26.

### V. Development of National Zoological Collections

The National Zoological Collections were enriched by the addition of 20189 identified specimens belonging to diversified animal groups from Protozoa to Mammalia; (2720 species).

VI. Identification and advisory services Identification and advisory services were extended to various research and teaching institutes in India and abroad, different Central and State Government departments and individuals. During the year 217 enquiries regarding identification of Zoological specimens, taxonomy, Zoogeography, etc. of Indian fauna were received and attended.

### VII. Computerisation of data on Zoological Collections

1200 data on registered General Collections of the National Zoological Collections were Computerised.

### VIII. Training and Extension Programmes

1. Training in the collection, preservation and identification insects and mites of economic importance was given to departmental as well as outside people.
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2. Training programme on collection and preservation on methodology of different groups of animals in the field as well as in the laboratory was organised for the junior staff members of this department.
3. Wildlife week was celebrated starting from 1st October, 1992.
4. Hindi Day was observed on 19-10-92.
5. World Environment Day was observed on 5-6-1992.

**IX Miscellaneous**

1. Five Week Basic Course on Environmental Impact Assessment was organised by ZSI for industrial managers. A total of 15 participants enrolled in the course. 20 members of multi-disciplinary faculty were drawn from different Government and non-government organisations.
2. Dr. A.K. Ghosh, Director, Zoological Survey of India was deputed by the Ministry of Environment and Forests to present a country paper in the 3rd International Congress of Ethnobiology held at Mexico city from to 14th November, 1992.
3. Environmental Information Service (ENVIS) on Animal Ecology was established in ZSI headquarters.

**ENVIRONMENTAL EDUCATION. AWARENESS AND TRAINING:**

Targets and Achievements during the year 1992-93 under Environmental Education, Awareness and Training Programme are as follows:

Items	Target for the year 92-93	Achievement
<b>A. Environmental Education, Awareness and Training</b>		
(i) Establishment of Eco/ Environmental clubs in schools through NGOs and voluntary bodies.	100	77
(ii) Telecast of environmental films.	24	30
(iii) Workshop for creating environmental awareness.	50	50
(iv) Publication of posters/ pamphlets and other publicity material	15	30
(v) Exhibitions	15	15
(vi) Supporting youth/ women organisations	20	30
(vii) Padayatras/rallies, etc	10	30
(viii) Production of documentary films/audio visuals	8	10

B. Grants-in-aid to Professional societies	3	2
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A total of Rs. 24,67,500 was released for constitution of Paryavaran Vahinis in 105 districts.

### **Environmental Information System (ENVIS):**

The ENVIS network responded to 4984 queries— 4382 national and 602 international Major areas on which queries were received pertained to the subjects such as wastes management, hazardous chemicals, pollution control, renewable energy, desertification, soil conservation, environmental management. etc.

### **INFOTERRA activities**

It organised a Regional INFOTERRA Workshop, which was attended by participants from South Asia Sub-region countries. The workshop recommended for strengthening information exchange in the region. ENVIS also updated information on Indian sources engaged in the environmental activities for inclusion in the international INFOTERRA Directory of Environmental Sources published by the UNEP.

### **Paryavaran Abstracts:**

The ‘Paryavaran Abstracts’ continued to be published quarterly. The journal was sent to scientific institutions, universities, scientists, engineers, etc.

### **ENVIS Network Expansion:**

ENVIS expanded its network by setting up four new ENVIS Centres in the areas of Himalayan Ecology, Animal Ecology, Solid Wastes disposal and Environmental Problems of Mining during the year 1992-93. The network, therefore, consisted of 17 subject oriented Centres.

Activities of the ENVIS Centres:

Some of the major programmes undertaken by ENVIS centres are as follows:

- Industrial Toxicological Research Centre, Lucknow: Data base on 85 food additives contaminants and toxicity profile of 75 chemicals was prepared.
- National Institute of Occupational Health, Ahmedabad, prepared monographs on acetone and carbon-di-sulphide as well as safety cards on benzene carbon tetrachloride, phenol, methyl alcohol and melathion were prepared.
- Centre for Ecological Sciences, Indian Institute of Science, Bangalore, developed a data base in the subjects of ecology, biological diversity, eco-development and conservation of natural resources for providing substantive information to the users.
- Environmental Planning and Coordination Organisation (EPCO), Bhopal, published ‘Environmental Status of Mining Activities in Amarkantak’, ‘Environmental Status of River Kshipra - a Preliminary Study on Problems and Perspectives’ were prepared. Besides, the

Centre also undertook a study for preparation of a status report on lime kilns and cement plants in Madhya Pradesh.

- A revised edition of the Directory of Environmental NGOs in India and three new directories viz. Pollution Monitoring Facilities and Campaign Support Services available with NGOs in India, Indian Expertise in the Environmental Sciences and Audiovisuals on Environment have been published by the ENVIS' Centre at World Wide Fund for New Delhi.
- A comprehensive data base on books, re-ports, monographs, thesis, etc., in the field of biodegradation of Wastes and environ-mental impact assessment was developed by the ENVIS Centre at Anna University, Madras with the ultimate objective of disseminating information to the users in the concerned fields.
- An information resource base in the subject areas of estuaries, mangroves, coral reefs and lagoons is being developed by the ENVIS Centre at Annamalai University, Tamil Nadu. The Centre has also started publishing a news letter during the year.
- A catalogue of the Periodicals of the Central Library and Bibliography on Desrtification and Soil Conservation is being prepared by the ENVIS Centre at Central Arid Zone Research Institute, Jodhpur.

### **Indira Gandhi Paryavaran Puraskar (IGPP):**

The IGPP was instituted in 1987. It is now awarded every year to an organisation as well to an individual for significant contributions in the field of environment. More than 40 nominations from various individuals and organisations have been received for consideration for this award for the year 1992.

### **NATIONAL MUSEUM OF NATURAL HISTORY (NMNH)**

Achievements of the National Museum of Natural History during the year 1992-93 are as follows:

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- (a) New exhibits were developed and installed in the museum galleries as part of the project of updating and renovating the public facilities of the museum.
  - (b) New interactive software relevant to digitised image documentation system and desk-top publishing for its display section as part of second phase of computerisation in the NMEH.
  - (c) The NMNH organised the following temporary exhibitions during the year:
    - (i) 'Water Pollution'.
    - (ii) 'Towards Green Villages'.
    - (iii) 'You and Environment' in the Mobile Museum of NMNH.
    - (iv) 'Environment and Development' at Teen Murthi Lawns, New Delhi.
  - (d) A large number of educational activities and outreach Programmes were conducted which included a month long summer programme for teenagers on 'Exploring the Environment', Teacher Orientation Workshops, Special programmes for handicapped children, School Loan service, production of environment
  - (e) Considerable progress was made in acquisition of photographs and slides on the flora, fauna and ecosystems of India in preparation for setting up a
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- National Photographic Documentation Centre.
- (f) The museum Library and the Film and Audio-visual Library were enriched with the new acquisitions.
  - (g) An Indo-US' Workshop on 'Environmental Oriented Natural History Museums—Exhibits, Programmes and Public Services' was organised by the NMNH under the auspices of the Indo-US Sub-commission on Education and Culture.
  - (h) Construction of the new building for the RMNH, Mysore completed and plans and designs for two galleries of the museum were finalised and exhibit development initiated.
  - (i) Project Reports for setting up the two other Regional Museums of Natural History at Bhopal and Bhubaneshwar prepared and finalised.

## **CENTRES OF EXCELLENCE**

### **Centre for Environmental Education (CEE):**

The CEE, Ahmedabad set up in 1984 continued its ; activities relating to the development of environmental education resource materials, training programmes, interpretation programmes and creation of environmental awareness among the children and the general community. Details of the activities of the centre during the year are as follows:

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- The National Report to UNCED titled 'Environment and Development: Traditions, Concerns and efforts in India' was prepared. The document aimed at bringing out the broad features of India's tradition of environmental awareness and action.
  - The first issue of Nature Scope India, 'Amazing Mammals' was disseminated to agencies in India and other countries. A catalogue of conservation related Initiative 6 in India by the people and government is being put together for which information on entries and illustrations are being finalised.
  - 'Vid Vagdana Pankhi' which is the third in the series of books on birds of Gujarat was published. - Development of materials accompanying the film 'Drakhi', the first of thirteen modules of teacher and student material was completed under the Children's Environmental Education Television (CEETV) Project.

### **CPR Environmental Education Centre (CPREEC) Madras:**

Besides continuing its normal programmes for creating and increasing consciousness and know material and education packages on environment, the centre has undertaken following major activities:

- Exhibitions on 'Birds', 'Trees', 'Vanishing Species', 'Sustainable Technologies', 'Man and the Environment', 'Why Save a Tree', and 'Nilgiri Biosphere Reserve' were organised.
  - A participatory science exhibition on Environmental Experiments for Children has been set up in Madras.
  - Two video Films 'Pachchai Kovil' 'Temple of Green' and 'Pasumai Payanam' ('Campaign on Wheels'), an audio cassette of Tamil Environmental folk songs and an audio visual on 'wasteland Development' in English, Tamil and Telugu were produced by the Centre.
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- a publication on 'Environmental Education in the School Curriculum and an accompanying Teachers' Kit and 'Energy—A Book of Facts and Activities' and several booklets and pamphlets were brought out by the Centre for distribution. A soil testing kit to determine Nitrogen, Phosphorous, Potassium and pH levels has been developed by the Centre.
- A low cost biological treatment of tannery effluents has been developed.

### **Ecological Research and Training Centre (ERTC), Indian Institute of Science, Bangalore:**

This Centre, established in 1983 with a mandate to focus on the ecology and environment of Western Ghats initiated more than 15 research projects covering various aspects of the ecology and environment of the Western Ghats. Other major activities are as follows:

- A book titled "This fissured land: an Ecological History of India" and several technical papers, popular articles etc. on various aspects of the Western Ghats were published.
- A consultation Workshop on Biodiversity of Western Ghats in collaboration with WWF-India and the Indian Institute of Science was organised.
- A workshop on "Methods in Behavioral Ecology" was held.
- A training programme on "Management of Environment and Forests" for IAS Officers was organised.

### **Centre for Mining Environment, Dhanbad:**

Projects pertaining to the following research work are coordinated by the Centre.

- Dust Control Technology in open cast coal mines.
- Changes in Vegetation index and Soil Moisture in India.
- Assessment of Socioeconomic life in a Mining Environment and measures for Settlement Planning.
- Experimental Studies on the Ecological Aspects of Reclamation in Open Cast Coal Mines in Jharia Coalfield.
- Monitoring Environmental Impacts of Iron ore, Limestone and China Clay Mining in Singhbhum District of Bihar Using Remotely Sensed Data.
- Development of coagulants for clarification of coal washery effluents.
- Studies on Air Quality in Jharia Coalfield with particular reference to the impact of some Mining Operations.
- Studies and Management of the Tailings and Spoils in Mining Areas etc. have been initiated.
- Two training programmes for in service personnel from Ministry and Associated Industries were organised.

### **NATIONAL NATURAL RESOURCE MANAGEMENT SYSTEM (NNRMS)**

37 Project areas have been identified for monitoring changes in environment by integrating conventional and remote sensing techniques by the Standing Committee on Bio-resources and Environment under this scheme. Out of these, 11 projects have been under-taken of which 8 projects have been completed. The remaining 3 projects are under various stages of completion.

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## **WETLANDS**

- Management action plans in regard to Kabar, Bhoj and Renuka were sanctioned.
- Comprehensive management action plans in regard to three wetlands have been finalised.
- An amount of Rs. 155 lakhs was released against the total allocation of 75 lakhs.
- One research project was sanctioned.
- A booklet on Wetlands, Mangroves and Coral Reefs was prepared by WWF-India to help generate awareness about the wetlands to the common people.
- A project on Mapping of Wetlands involving remote sensing technology was initiated through National Natural Resource Management System.
- A booklet on Conservation and Management of Wetlands in India giving the approach for conservation of wetlands was published.

## **MANGROVES & CORAL REEFS**

- Management action plans in regard to man-grove areas viz. Sunderbans, Goa, Achra/Ratnagiri, Coringa, Pichavaram, Grondapaur were sanctioned.
- Comprehensive management action plans in regard to three mangrove areas have been prepared.
- An amount of Rs. 96 lakhs was released against a provision of Rs. 50 lakhs.
- Three research projects were sanctioned.

## **BIOSPHERE RESERVES**

Financial assistance was released to various State Governments for implementation of Action Plans for the operational Biosphere Reserves during 1992-93 as per the following break-up:

Nilgiri (Karn)	23.275 lakhs
Nilgiri (T.N.)	14.70 lakhs
Nanda Devi	33.35 lakhs
Nokrek	4.00 lakhs
Gulf of Mannar (T.N.)	11.35 lakhs
Sunderbans	23.00 lakhs

The activities involved mostly are Survey and Demarcation, Protection, Eco-restoration, Research etc.

The guidelines were framed for various eco-development activities. In the manipulation zone, where Universities/Research organisations were asked to furnish proposals for supplementing the management action plan, SFC memo was finalised for Biosphere Reserves and review of Management Action Plans was held in the meeting, in which, all the nodal departments in the concerned states gave presentations about the achievements made.

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## **BIODIVERSITY CONSERVATION**

The report prepared by the two sub-groups constituted by the In-house Committee chaired by Secretary (E&F), was circulated to all State Governments/UTs to critically examine the recommendations of the report and incorporate the measures suggested in their plans and programmes. This activity was then being coordinated by the Wildlife Division.

During the year, an exercise was initiated to pre-prepare a Status Report, since as yet there is no comprehensive report covering the various facets of bio-diversity.

India had contributed effectively in the inter-governmental negotiations for finalising the Convention on Biological Diversity, which the Government of India signed during the UNCED Earth Summit held at Rio de Janeiro, Brazil in June, 1992. Subsequent to the signing of the Convention, extensive consultations were organised at various levels to analyse the implications of the Convention. These included an interministerial meeting of the In-house Committee, a one-day Expert Group Consultations on Biodiversity, workshops for policy makers, and meeting of the Core Group constituted for follow up of the Convention. As a result, 50 action points were identified for implementation at the national, state, and local levels. A project was commissioned to Centre for Medicinal and Aromatic Plants, Lucknow (CIMAP), for writing of a book on endemic medicinal plants of economic significance.

## **ASSISTANCE TO BOTANIC GARDENS**

Project proposals for the scheme were invited from State Governments/Universities/Research Institutes. Eighteen proposals were received and evaluated. Sub-sequentially, funds were released to Bhagalpur University, Tamil Nadu Agricultural University, CIMAP & Regional Station at Kodaikanal and Governments of Karnataka and Sikkim. A Special financial assistance of Rs. 14 lakhs was also released to the Tropical Botanical Garden and Research Institute, Trivandrum (TBGRI) for rebuilding their botanic garden and plant collections lost during the floods of Oct.- Nov., 1990. The total expenditure under the scheme was Rs. 55.99 lakhs, as against the target of Rs. 30 lakhs.

## **RESEARCH & DEVELOPMENT**

112 new projects remained operational under Environment Research Programme, Man and the Biosphere Programme and Action-oriented Research Programme for Eastern and Western Ghats. 51 new projects were sanctioned against the target of 35. Final report of multi-institutional project on Seed Biology and Tissue Culture of endangered/threatened medicinal plants was prepared. All 112 projects were reviewed for their progress through Expert Committees. An expenditure of Rs. 312.51 lakhs was made against an allocation of Rs. 315 lakhs.

Pitamber Pant Fellowship Dr. T. N. Ananthakrishnan of Loyola College, Madras was awarded Pitamber Pant National Environment Fellowship Award for the year 1992. G.B. Pant Institute of Himalayan Environmental and Development In the G.B. Pant Institute of Himalayan

Environment and Development, a unit of the Institute was established at Kullu in Himachal Pradesh. 12 research projects remained in progress.

## **PREVENTION & CONTROL OF POLLUTION**

### **Central Pollution Control Board (CPCB)**

- (i) Industrial estate survey was undertaken in Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Uttar Pradesh, Tamil Nadu and West Bengal.
- (ii) Noise Pollution survey has been completed at Lucknow and Pune, Vadodara & Cochin and survey is being carried out at Indore.
- (iii) Under ECOMARK Scheme, Central Pollution Control Board has developed draft criteria in respect of 13 categories of products, whereas the final criteria for Soap and Detergent has been notified. The Ministry of Environment and Forests has directed the Board to develop draft criteria for 16 categories of products
- (iv) Training courses on Hazardous waste Characterization, analysis and disposal of waste sampling and analysis of industrial waste, environmental auditing and computer appreciation were conducted.
- (v) A number of indepth pollution control studies have been undertaken in industries falling under different categories of industries identified by the Government.
- (vi) For quick transfer of data between Central Pollution Control Boards and State Pollution Control boards on-line linkage between Central Pollution control Board and State Pollution Control Boards is being established through NICNET of NIC. Modems have been procured for 16 State Boards and are at various stages of installation.

### **Environment Policy & Law**

The National Environment Tribunal Bill, 1992 was introduced in the Lok Sabha on 18 August, 1992 for consideration and passing in the Parliament. The Environment Friendly Scheme has been started and will continue for the whole of Eighth Five-Year Plan.

### **Hazardous Substances Management**

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- (1) The Red Book for Crisis Management has been revised to update names, addresses and telephone numbers. Duties have also been specified.
- (2) Preparation of off-site plan for 9 districts was initiated. A meeting was held with the Consultants and preliminary reports for 3 districts were received.
- (3) Draft Manual on Emergency Preparedness for chemical disasters has been prepared and circulated for comments.
- (4) A meeting was held on environmentally sound urban solid waste management in which Secretaries, Department of Environment of State Governments, Chairman, State Pollution Control Boards, representatives of other Ministries, Public Sector

Undertakings, municipalities participated. Recommendations were made on management of urban solid wastes which 'gave been circulated to the concerned agencies for implementation.

- (5) Inter-departmental review meeting were held to promote utilisation of flyash based products. The State Governments were requested to promote the use of flyash in Government construction work.

### **Environmental Audit**

A Scheme for Environmental Audit was approved. Tiiis scheme is an assessment of an industry of its processes, technology etc. to ensure observations of pollution standards, waste minimization etc. The scheme is proposed to be implemented in three phases during VIII Plan.

The phase I has already been initiated. A Notification has already been published under which 311 the industries, which are required to take, consent or authorisation or both are required to submit an environmental statement in the prescribed form to the respective State Pollution Control Boards. Some audits are being taken up in a few of the critically polluted sectors identified to initiate the scheme. Adoption of Clean Technologies by Small Scale industries The scheme proposes to provide subsidy to Small Scale Industries through Small Industries Development Bank of India for adopting pollution control measures. Subsidy under this scheme would be given to ensure parity with the interest rate under the '0Jorld Bank Industries Pollution Control Project. The new scheme also provides for adoption of clean technologies by Small Scale Industries (SSIs) through assistance for education and training of SSIs through small Industry Development Organisation - an apex body of Development Commissioner SSI. Ministry of Industry.

### **IMPACT ASSESSMENT**

The budget allocation for 1992-93 was Rs. 200 lakhs and the actual expenditure was Rs. 406.95 lakhs. The increase in expenditure was due to proposals deferred during 1991-92 on account of economy measures. The physical targets as well as actual during 1992-93 in various sectors were as follows:

Sl. No	Sector	Appraisal of projects Target	Appraisal of projects Actuals
1	Mining Sectors	50	51
2	Industry Sectors	60	36*
3	Atomic Power Sector	10	02*
4	Thermal Power Sector	30	47
5	River Valley Sector	60	31*
6	Other Sector	50	65

\* No. of proposals received was less than anticipated.

## **INTERNATIONAL COOPERATION**

The Ministry of Environment and Forests is the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMOD) and the International Union for Conservation of Nature and Natural Resources (IUCN). Annual financial contributions are made through active participation to obtain adequate benefits from the above organisations. The Ministry also functions as the nodal agency for participation in international agreements such as the Convention on International Trade in Endangered Species (CITES), the Convention on A Migratory Species, Ramsar Convention on Vietlands and the Basel Convention on Transboundary Movement of Hazardous Substances.

The United Nations Conference on Environment and Development was held in Rio de Janerio, Brazil in June 92 to which a high level delegation from India was sent. India played an important role in putting forth the views and concerns of the developing countries in the UNCED deliberations. A meeting with Environment Ministers of SAARC countries was organised to formulate a common strategy of SAARC nations for UNCED. Pre UNCED and Post UNCED consultations were also organised with non governmental organisations and experts. Two publications "Environment and Development—Traditions, Concerns and Efforts in India" and 'Environment and Development—India's approach were brought out. India also has been astively participating in the deliberations of the intergovernmental panel on Climate Change (IPCC). India also signed the Global Conventions on Climate Change and on Biological Diversity Change during the Rio Conference.

During the year India acceded to the amended Montreal Protocol on Substances that deplete the ozone Layer. The Indian delegation also participated actively in the fourth meeting of Parties to the Montreal Protocol at Copenhagen in November, 1992. India now has access to the Multilateral Fund set up under the Protocol.

## **GANGA ACTION PLAN**

As on April 01, 1992, 189 Schemes, out of 261 Schemes sanctioned were completed. During 1992-93, 17 Schemes were completed raising the total number of Schemes completed to 206. Eight sewage treatment plants (STP), out of the total 35 sewage treatment plants (STPs) to be established, had become operational. The Schemes for sewage interception and diversion were accorded priority under the (Ganga Action Plan. In all, 88 Schemes were sanctioned in the three state which involved laying of 370 kms. of sewers (including force-mains) and installation renovation of 129 sewage pumping stations. Sixty-one schemes were completed. As a result. 489 mld of waste water flowing into the river has been diverted, out of which 227 mld is being taken to the sewage treatment plants for treatment. The Plants when completed, will intercept/divert 873 mld waste water and have capacity to treat 894 mld waste water.

Under the low cost sanitation programme, 4 3 Schemes were taken up in the 3 States. Forty-one schemes involving construction of 2757 public toilet complexes and 47705 individual pour flush latrines were completed. The others were in various stages of construction. These had helped tourists and the people living near the river bank to use these toilets which had helped in reducing pollution of the river.

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Four Automatic Water Quality Monitoring Stations (AWQMS) were installed. Two training programmes for Technicians and Operators for maintaining operating the stations were completed. A project on rearing of turtles at Varanasi was in progress to utilize the scavenging habits of turtles. Based on the success of the project during the first four years, the project was extended. As on date, 25000 turtles were released in Varanasi sanctuary and about 5000 turtles were in the captive rearing stage which would be released at Patna in Ganga. One Unit of Rotating Biological Rope Contractor Process was commissioned at Swarg Ashram, Rishikesh. A new method "Afforestation with Raw Sewage" developed by the Central Soil Salinity Research Institute (CSSRI), Karnal applied in the Ganga Action Plan at Buxar and Varanasi.

43 industries out of 68 gross polluting industries along the river Ganga installed Effluent Treatment Plants as a result of legal and administrative measures taken under the Environment (Protection) Act, 1986 and Water (Prevention and Control of Pollution) Act 1974. Capacity to treat 212 mld out of 260 mld effluent being generated by these 68 units were created

Three of chrome recovery pilot plants to stop the inflow of harmful chromium into the river and reuse the recovered chromium were set up in Jajmau area of Kanpur.

## **GANGA ACTION PLAN PHASE II AND NATIONAL RIVER ACTION PLAN**

An inventory of 590 industrial units covering river Ganga and its major tributaries in the States of Uttar Pradesh, Bihar and West Bengal to include in Ganga Action Plan Phase II and 254 industrial units situated along 37 polluted river stretches identified under National River Action Plan were prepared.

### **CIVIL CONSTRUCTION UNIT (CCU)**

Major Works completed in 1992-93:

- (i) Construction of Office building for BSI, Jodhpur (S.H. Garages and path).
  - (ii) Construction of 44 Nos. quarters at FRL Bangalore.
  - (iii) Construction of compound wall of IGNFA at Dehradun.
  - (iv) Construction of Instt. of Genetics & Tree Breeding, Coimbatore.
  - (v) Construction of 18 staff qrs. for ZSI at Dehradun.
  - (vi) Construction of Office-cum-lab. building for FSI at Dehradun.
  - (vii) Construction of 49 staff quarters for IGNFA at Dehradun
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