

## **CHAPTER 2C**

### **REVIEW OF OVERALL PERFORMANCE DURING 1992-93**

#### **FORESTRY AND WILDLIFE**

##### **Forestry Education and Training**

##### **Indira Gandhi National Forest Academy (IGNFA):**

Indira Gandhi National Forest Academy (IGNFA) was created on 25-5-87 by upgrading the Indian Forest Colleges at Dehradun and delinking it from the Forest Research Institute. The Academy is responsible for initial in-house training for Indian Forest Service probationers. The training is spread over a period of two years. The Institute is charged with the duty of revising teaching methods and organising in-service training programmes for mid carrier officers of various States.

At present, 66 probationers and 2 foreign trainees are undergoing training in 1991-93 batch, alongwith 75 probationers in the 1992-94 batch.

##### **State Forest Service and Rangers Colleges:**

There are three State Forest Service Colleges located at Dehradun (UP), Burnihat (Assam) and Coimbatore (Tamil Nadu). These Colleges run 2 years Course for SFS Officers. Besides this, there is a Rangers College at Kurseong. The College imparts training to Range Officers of State Forest Departments.

At present two batches of 1991-93 and 1992-94 are undergoing training in State Forest Service Colleges. Number of Trainees in these two batches are 43 and 37 respectively. During the year, trainees of 1990-92 batch passed cut the training course. At present in Rangers College, 93 Rangers of 1991-93 batch are undergoing 2 years 'training course. The training is likely to be completed in July, 1993. Besides trainees of 1992-94 batch also commenced during the year and number of trainees in this batch is 43.

##### **Indian Institute of Forest Management:**

Indian Institute of Forest Management, Bhopal (IIFM) was established in the year 1982 as an autonomous organisation of this, Ministry. The Institute provides training in management and allied subjects to persons from the Indian Forest Service, State Forest Service, Forest Development Corporation and Forest-related Industries. The Institute is also providing support to National Afforestation and Eco-development in project appraisal, monitoring and evaluation and special studies etc. in the field of wastelands development.

During 1992-93, the following activities are undertaken.

- 23 students were admitted in 1992-94 batch of Post Graduate Programme in Forest Management.
- 14 Management Development Programmes have been proposed.

- 14 Research Projects on various ecological and Socio-economic issues were undertaken.
- An amount of Rs. 15 lakhs have been earmarked for Library development.
- One PCAT - each for Library and Computer Centre has been installed.

### ***Forestry Research***

Forestry Research has been reorganised after an indepth review to achieve the twin goals of conservation of natural forests, improving productivity and stepping up of the pace of afforestation and wasteland development.

### **Indian Council of Forestry Research and Education (ICFRE)**

The ICFRE was established in December, 1986 by restructuring of Forest Research Institute, and Colleges to oversee the activities relating to forestry research and education in the country and coordinate the efforts of all the concerned institutes and organisation. With effect from 1-6-1991, ICFRE had been given autonomous status. The Council has identified the following areas of research:

- Develop mitigation strategies in forestry sector to reduce and store green house gases.
- Research in upland watershed management (integrated soil and water conservation) to check siltation and water scarcity and boost afforestation;
- Research in reforestation of degraded lands and problem soils (barren / mined / waste / water-logged / salt affected lands);
- Research in conservation, protection, and sustainable development of existing forests to conserve biodiversity.
- Increasing productivity of existing forests and future plantations.
- Research on multi-purpose trees in farming systems.
- Research on improved utilisation, including improved recovery and processing of traditional wood and paper products;
- Research on non-wood forest products which provide sustenance to people and supply raw-materials to a large number of forest industries;
- Research in modern tools, equipments, techniques and operations for afforestation, logging and extraction of forest produce;
- Protection of forests from entomological and pathological diseases;
- Socio-economic research for motivating farmers to adopt tree farming in a manner similar to crop based farming.
- Research on policy strategies and combination of measures desired for enlarging area under forest including studies on property rights and land tenure, culture and gender tissues involved in conservation, non-timber products, effects of tariff and non-tariff barriers, legal and regulatory setting for forestry and other laws regulating tree harvest.

ICFRE has following six research institutes namely:

- (1) Forest Research Institute, Dehradun.

(2) Institute of Forest Genetics and Tree Breeding, Coimbatore.

(3) Institute of Wood Science and Technology, Bangalore.

(4) Institute of Deciduous Forests, Jabalpur (the institute has been re-named as Tropical Forest Research Institute).

(5) Institute of Arid Zone Forestry Research, Jodhpur.

(6) Institute of Rain and Moist Deciduous Forest Research, Jorhat.

During 1992-93 the achievements of six Research Institutes are as under:

### **FOREST RESEARCH INSTITUTE, DEHRADUN**

1. Nursery and planting technology has been developed for *Melocanna bambusoides*.
2. Mulch experiment for soil ameliorative techniques for degraded and eroded lands has been conducted.
3. Survey work to select sites for studies on effect of brackish water on tree growth has been completed. Experiments are now being laid out.
4. Epidermal studies for the genus *Thamnocalamus* were completed.
5. Studies on population dynamics and species diversity in sal forests continued.
6. More shrubs are taken up for studies for calorific values and burning properties.
7. Growth and performance studies for *Grevillea roubusta*, *Bombax*, *ceiba*, *Acacia nilotica*, *Terminalia arjuna*, *Dalbergia sissoo* and *Tectona grandis* were completed.
8. Studies were completed to evaluate the effect of tree species, viz. *D. sissoo*, *A. nilotica*, *Eucalyptus* and production of lignosulphonates on pilot scale carried out.
9. Karft sulphite pulps were prepared using Anthruqueonons (AQ) as catalyst and bleached plus we-re evaluated for various strength properties.
11. Various varieties of papers were manufactured from waste paper for studies.
12. 18 tree species are studied for loss of seed by seed insects during field as well as storage.

13. Preliminary analysis was conducted for study of genetic divergence among different provinces of *Acacia nilotica*.
14. Evaluation of physical and mechanical properties of *Melia azadirach*, *Quercu serrata* and *Michelia champaca*, was undertaken.
15. Studies on effect of age on strength properties of E. hybrid were completed.
16. Sandwich panels from wood based material were developed and testing continued.
17. Wirebound boxes with improved joints were developed.
18. Design and standards for Plant carrier and Dibble Bare are under progress and likely to be finalized by March, 1993.
19. Six permanent and 4 temporary sample plots of Poplar, *Acacia tortilis* and *Prosopis juliflora* were laid out and data from 65 sample plots were completed.
20. Impact of lopping treatment on growth of *Acacia nilotica* in Haryana was analysed.

#### **INSTITUTE OF FOREST GENETICS AND TREE BREEDING, COIMBATORE**

1. Stumps from plus tree have been collected for one parent progeny trial of *Tectona grandis*.
2. Material from selected candidate tree have been collected for genetic upgrading of *Casuarina equisetifolia*.
3. Rooting trials with *A. nilotica*, *P. pinnata* and *Gliricidia sepium* have been initiated for standardisation of vegetative propagation technique. Clonal multiplication of Teak initiated.
4. Disease survey in forest nurseries and plantations was conducted and control measures suggested.
5. Germination capacity of seeds of *Tamarindus indica*, *Azadirachta indica* undertaken for standardization of selected species for genetic improvement. Study of variation in phenology from tree to tree has been taken up for selected species.
6. Plots for plant succession study in degraded forests of Western Ghats were laid out and data recording undertaken.
7. Data recording and soil sample collection for study on nutrient cycling in *Acacia planifrons* plantations carried out and analysed.

8. Data collection is undertaken to workout the economics of cultivation and marketing of casuarina in South India.

### **INSTITUTE OF WOOD SCIENCE AND TECHNOLOGY, BANGALORE**

1. Determination of physical and mechanical properties of *Perocarpus angolensis* and suitability for future making is under progress and will be completed.
2. Delignification has been found to increase 3.5 times the yield of reducing sugars from mixed sawdust by enzymatic hydrolysis.
3. Mushroom cultivation using sawdust media as a preliminary step on composting sawdust was taken up.
4. Dimensional movement in *Acacia nilotica* and *Hevea brasiliensis* evaluated.
5. Studies on techniques of prophylactic treatment against insect borers and fungi will be carried out.
6. About 10,000 grafted sandal seedlings and about 10,000 seedlings from seeds of seed stand will be raised and distributed.
7. Ten villages from the states of Karnataka and Andhra Pradesh will be identified, planting and demonstration using improved stocks will be carried out.

### **TROPICAL FOREST RESEARCH INSTITUTE, JABALPUR**

1. Fertiliser trials on *Albisia procera* at nursery and *Dalbergia sissoo* in plantations were carried out.
2. Chemical control experiments for diseases of medicinal plants were carried out.
3. Biological control of some diseases of forest trees using extract of Marigold leaves were tried.
4. 3 new species of seedborers were recorded for the first time from Indian subcontinent. The biology and life cycle of *Albizia* seed borers in immature seed were studied.
5. Efficiency of biopesticides against teak leaf skeletonizer was studied.
6. Survey was undertaken on species preferences in villages of Vindhyan and Satpura agroclimatic zone.
7. Data are collected for increasing of plant growth in plantations through inoculation rhizobium culture.

8. Edible rhizomes like Dioscoria, Impomea Colocaria etc. were collected for propagation and assessment of their nutritive value.

9. Floristics studies and Ethnobotanical studies in the central region are planned and parameters finalized.

#### **INSTITUTE OF ARID ZONE FORESTRY RESEARCH, JODHPUR**

1. Fertilizer dose were applied and growth observations were taken for soil fertility and fertilizer use management studied.

2. Survey was undertaken to locate superior germplasm of *Anogeissus pendula* for clonal propagation and genetic improvement.

3. Identification of willing farmers for comparative study and demonstration of various land use techniques carried out.

4. Survey, evaluation and management of insect pests termite infestation in Neem was studied.

#### **INSTITUTE OF RAIN AND MOIST DECIDUOUS FOREST RESEARCH, JORHAT**

1. Studies on flora of Jorhat District and its vicinity is continued and preliminary identification of 20 specimens was completed.

2. Energy content of some bamboo species for fuel wood species is completed for study of effect of shifting cultivation on the vegetation microbial population and soil nutrients in North East India, Physico-chemical, properties, 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 forest types of N.E. India initiated. VAM spores from the rhizosphere soil and root samples of some forest tree species were recorded. Some diseases were recorded from the forest nurseries.

5. For micro and macro propagation experiment on nodal explant from newly sprouting shoot of *Bambusa tulda* was started and the observations are under analysis.

#### **INDIAN PLYWOOD INDUSTRIES RESEARCH AND TRAINING INSTITUTE (IPIRTI)**

The Institute was established in 1963 jointly by the Plywood Industry and the Government of India. It was under the administrative control of CSIR till March, 1978 and subsequently under Ministry of

Industry till April, 1990. With effect from 1-5-1990, it has come under the administrative control of Ministry of Environment and Forests.

2. During 1992-93, the following activities were undertaken by the Institute:

Continuation of research work o its 42 ongoing Research Projects.

- 13 Research Reports are expected to be completed during the year.
- The Institute conducted eight short-term course in wood processing and a certificate course in mechanical wood industries technology.
- Tests for conformity to relevant Indian standard were carried out on 369 samples.
- 7 visits were undertaken to various factories for extension work.
- 2 Technical Feasibility Reports were finalized.

### ***Survey and Utilization of Forest Resources***

A Policy Advisory Group (PAG) has been set tip in this Ministry with an objective to make efficient utilization of fuelwood vis-a-vis conservation of fuelwood and exploring ways and means for fuelwood substitution. The PAG, in its 2nd meeting held on I8-9-1992 have made the following recommendations:

- (i) Steps may be taken to popularize improved chullahs with due regard to design and acceptability in each area. There should be a follow-up of chullah supply programme in each area for atleast a period of two years.
- (ii) Gobar Gas Plant should be promoted with more vigour and, the possibility if using human waste to produce biogas should be explored.
- (iii) The programme of improved crematoria on the line of Gujarat should be popularised.
- (iv) In order to reduce consumption of fuelwood in hilly areas, a scheme for supply of pressure cookers on subsidized rates be taken up.
- (v) The techniques of wooden boxes filled with straw for cocking partially cooked foods should be populari
- (vi) Intensive efforts should be made to popularize solar cookers and solar beaters through supplies at subsidised costs.
- (vii) Possibility of generating power from wind mills and its use for cooking in Dabbas should be explored.

Follow up action (in the recommendations of PAG is being taken and for this purpose, all Chief Secretaries, State Governments have been informed to take steps for locating wood substitution.

## Forest Survey of India

Forest Survey of India (FSI) carried 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 re-inventory to facilitate scientific forestry planning. FSI intends to acquire Digital Cartography System and for this purpose Global tenders have been floated. The purchase is expected to materialize during the next financial year.

The achievements of FSI during 1992-93 are as under:

Sr. No.	Item of work	Unit	1992-93	
			Target	Achievements upto Oct. 1992
1	Forest Inventory	Forest area in sq. km.	24,635	3,348
2	Data Processing	-do-	24,043	*
3	Thematic mapping	Sheets of 1:50,000 scale	260	102
4	Vegetation mapping	Sheets of 1:250,000 scale	182	48
5	Training	Persons trained	90	39
6	Special Study	No. of areas	1	-

\* The quantitative achievement expected by March, 1993.

## Forest Conservation

The Forest Conservation Act, 1980 was enacted with a view to checking indiscriminate deforestation and diversion of forest land for non-forest purposes. The Act was amended in 1988 to make it more stringent. Advisory Committee with representation of eminent personalities was set up under this Act. At field level, there are six Regional Offices situated at Bangalore, Bhopal, Bhubneshwar, Lucknow, Shillong and Chandigarh with Head-quarters at New Delhi. These Regional Offices were set up in 1986 to monitor cases under Forest Conservation Act. Later in 1988, these Offices were strengthened and were also entrusted with the responsibility of monitorings cases under Environmental Protection Act. Region-wise targets / achievements and monitoring of cases under Forest Conservation Act and Environmental Protection Act as under:

Regional Office	Forest (Conservation Act (No. of cases)		Environment (Protection) Act (No. of cases)	
	Target 1992-93	Achievement up to Sept. 1992	Target 1992-93	Achievement up to Sept. 1992
Bangalore	175	101	80	62
Bhopal	175	42	80	29

Bhubaneswar	175	81	80	63
Lucknow	175	81	80	43
Shillong	120	45	45	21
Chandigarh	80	38	35	16
Total	900	388	400	234

### ***Forest Protection and Regeneration***

The scheme – “Development of Infra-structure for Protection of Forests from Biotic Interface” has been transferred to States. The Plan allocation for 1992-93 for this scheme is Rs. 325 lakhs. As per the guidelines for Planning Commission, the funds to tune of Rs. 295 lakhs have been released to the various states.

With the experience gained from Modern Fire Control Project launched in April, 1984 with UNDP assistance, a new scheme - "Introduction of Modern Forest Control Methods" have been initiated during 1992-93. The VIII Plan outlay of the scheme is Rs. 5 crores. The scheme is a Centrally Sponsored and envisages 100% assistance on non-recurring items. The SFC Memo of the scheme was approved by the Standing Finance Committee in its meeting held on 20-12-1992. The budget allocation for the year 1992-93 is Rs. 100 lakhs. The proposals for release of Central assistance to various States as per guidelines of Schemes are being examined.

### ***Association of Scheduled Tribes and Rural Poor in Regeneration of degraded forests***

During the VIII Plan, a new scheme - "Association of Scheduled Tribes and Rural Poor in Regeneration Of Degraded Forests" will be introduced. The EFC Memo of the scheme was approved. A Central Assistance of Rs. 1.6 crores is expected to be released during the year, 3750 ha. of degraded forest land would be regenerated and 2000 families would be benefited.

## **FOREST POLICY**

### ***National Forestry Action Programme***

With the announcement of new National Forest Policy in 1988, it became necessary to orient all the on-going forestry practices and programmes to meet the objectives set by it. Consequently an integrated perspective programme for 20 years and action programme for 5 years is being prepared under the project "National Forestry Action Programme". The P17 F document for the National Forestry Action Programme has been posed to the Department of Economic Affairs, for onward transmission to UNDP. Once this project is sanctioned, the budgetary allotment of Rs. 30 lakhs will be utilized.

## **AFFORESTATION & ECO DEVELOPMENT**

In August, 1992, a new Department of Wastelands Development in the Ministry of Rural Development was created. A new Board namely the National Afforestation and Eco-Development Board (NAEB) was set up in the Ministry of Environment and Forests. Since the NAEB is responsible for implementing schemes in the forest areas and areas adjoining forests, parks and sanctuaries etc., the schemes of Margin Money Assistance to Autonomous bodies and Grants-in-Ad (partially) were transferred to the National Wastelands Development Board in the Department of Wastelands Development. Moreover, in view of the decision taken by the Planning Commission to decentralize the planning process, the People's Nursery Scheme has been transferred to the States. The Budget Estimate of the erstwhile NWDB in the Ministry of Environment & Forests was Rs. 115 crores. Consequent to the transfer of two schemes & corresponding staff to NWDB in the Department of Wastelands Development, an amount of Rs. 26.19 crores has been transferred to NWDB out of the Budget Estimates of Rs. 115 crore. The rest Rs. 88.81 crores is the budget allocated to NAEB. Therefore the NAEB is now responsible for Operating 6 schemes. The physical progress of these schemes during the year 1992-93 (up to January, 1993) is as follows:

Scheme	Physical target for 1992-93	Physical achievement during 1992-93 (up to Jan. 1993)
Integrated Wastelands Development Projects Scheme	6,000 ha.	40,000 ha.
Fuelwood/Fodder Projects Scheme	42,000 ha.	27,000 ha.
Raising of Minor Forests	10,770 ha.	640 ha.
Produce including Medicinal Plants Scheme		
Seed Development Scheme	22 States (to be assisted)	19 States (assisted)
Aerial Seeding Scheme	17,770 ha	27,320 ha.
Grants-in-Aid Scheme (for Voluntary agencies)	40 Projects	32 Projects

The following Policy Advisory Groups (PAGs) were set up in NAEB to address crucial policy issues:

- Grazing and Livestock Management
- Benefit Distribution from Common Lands

The draft reports of the PAGs on Grazing & Livestock Management as well as on Benefit Distribution from Common Lands have been finalised and were placed before the Board for approval in the 10th meeting of the National Afforestation and Eco-development Board. However, it was decided to consider the reports in the next meeting of the Board.

### ***Wildlife***

The scheme – “Strengthening of Central Wildlife Division and Consultancies of Special Tasks” started from 1986 with activities like Strengthening of Central Wildlife Divisions and Regional Offices in Delhi, Bombay, Calcutta and Madras with adequate manpower and development of infrastructure, for better enforcement of Wildlife (Protection.) Act, CITES etc. Under this Scheme, assistance of Rs. 30,000 was given to Dr. Prakash Gole for study and survey of Black necked Crane, Rs. 2.50 lakhs was released to Government of Rajasthan for experiments on Juvenile Sibes at Bharatpur and Rs. 75,000 was given as grant-in-aid to ecological Society for participation in an experiment of artificially hatched Siberian Crane at Russia.

The Central Zoo Authority came into existence in February 1992 and the rules for recognition of zoos were finalised in consultation with State Government and notified in August, 1992.

### ***Project Tiger***

The Centrally Sponsored Scheme "Project Tiger" was launched on 1-4-1973 to ensure maintenance of viable population of the Tigers in India. Presently, there are 19 identified Tiger Reserves in 13 States covering an area of 29,716 sq. km.

Some of the activities undertaken during the year 1992-93 are as under:

- Inclusion of one new area - Pench National Park in Project Tiger.
- Biennial Review of all Tiger Reserves have been taken up.
- Monitoring and evaluation of 9 Tiger Reserves has been initiated by the independent agencies through the State Government.
- Computerization work for Monitoring various activities on all Tiger Reserves has been initiated.
- The development activities like construction of road, building / Inspection patch, measures for fire protection, development of water facilities are continuing in all Tiger Reserves.
- To commemorate the completion of 20 years of Project Tiger, various activities at State level and Central level have been initiated. It includes holding International Symposium on Tigers, printing of booklets, arranging photographic exhibition, production of film posters etc.

### ***Assistance for development of National Parks and Sanctuaries***

Under this scheme, financial assistance is provided to states for development of national parks and sanctuaries. During the current year, financial assistance was provided to 33 National Parks and 178 Sanctuaries for continuation of works relating to protection and management of wildlife.

### ***Assistance for Control of Poaching and Illegal Trade in Wildlife***

As per the decision of National Development Council, the said scheme has been transferred to the States. According to the guidelines issued by The Planning Commission, the funds to the tune of Rs. 40.09 lakhs, have been released to the various States.

### ***Project Elephant***

The scheme started in the year 1991-92. The Scheme would be continued during the VIII Plan. By January 1993, an amount of Rs. 165.34 lakhs have been released to 11 States for development activities in the identified Elephant Reserves.

### ***Eco- development in and around protected areas***

The scheme started in the year 19-91-92 and would be continued during VIII Plan. By January 1993, an amount of Rs. 169.765 lakhs have been released for assistance to 4.5 protected areas.

### ***National Zoological Park***

On the recommendations of the Indian Board of Wildlife, the Government of India had set up a National Zoological Park in the Capital for breeding of fauna, to educate and provide recreation for the people. On an average, 20 lakhs people are visiting the said Park every year.

The targets for 92-93 and likely achievements during the year are as under:

S.No.	Targets for 92-93	Achievements for 1992-93
1	Face lifting of different animal enclosures.	Partly completed
2	Construction of Cheeta enclosure Completed	Completed
3	Expansion of white tiger enclosure	Completed
4	Construction of visitors centre	Completed
5	Modification of water moats	Will be taken up

### ***Wildlife Institute of India***

Wildlife Institute of India (WII) is a National Institute for Wildlife and has turned out a large number of competent wildlife managers and research Scientists. A 2 years course (M.Sc.) in Wildlife Biology, a Post Graduate Diploma in Wildlife Management and a 3 month Certificate course in Wildlife Management are conducted in the Institute on a regular basis. The Institute has also been conducting short capsule courses field workshop for senior forest Officers. The achievements of the Institute during 1992-93 are as under:

Course	No. of Persons
M.Sc. Course in Biology	7
P.G. Diploma in Wildlife Management	19
Certified course in Wildlife Management	17
Field Workshops / Short Courses	70

During the year, 23 research projects covering the high Himalayas, Tarai, Moist Peninsular Forests, Rann of Kutch, Swamps, Grasslands, Man-wildlife relationship etc. were continued. The Institute have completed 12 research projects and 5 new proposals under Indo-US collaboration are taken up during the year.

### ***Animal Welfare Board***

The Animal Welfare Board was established under Section 4 of the Prevention of Cruelty to Animals Act, 1960. The work of the board came on transfer to this Ministry from the Department of Agriculture & Cooperation in March, 1990.

For promoting the animal-welfare activities and to prevent infliction of cruelties to animals, the Board encourages activities of the Animal Welfare Organizations recognized by the Board by giving financial assistance for implementing welfare schemes.

The achievements of the Board during 1992-93 in this regard are as follows:

Sr. No.	Welfare Schemes	No. of Organizations likely to be benefited
1	Setting up rescue Home and Animal Shelters	50
2	Setting up Neutering centre for stray dogs	25
3	Purchase of Ambulance for Mobile Animal Clinic	20
4	Veterinary Dispensary	50
5	Development of grazing grounds	5

Animal Welfare Board of India received grant-in-aid of Rs. 75 lakhs under Plan and Rs. 22.00 lakhs under Non-Plan for promoting animal welfare. Animal Welfare Board of India provides financial assistance to Animal Welfare organizations and Society for Prevention of Cruelty to Animals. The assistance is provided for anti-rabies, rescue homes, shelter homes, veterinary assistance etc.

## **ECOLOGY & ENVIRONMENT**

### **SURVEY**

#### ***Botanical Survey of India***

Survey and Taxonomic studies were undertaken on identification, description, nomenclature and preparation of key to the genera and species of Assam, Arunachal Pradesh, Nagaland, Mizoram, Sikkim, Andaman & Nicobar Islands, South Western Ghats, cold deserts of High altitude of Jammu & Kashmir, Himachal Pradesh and Madhya Pradesh Vol. 11 and editing of Flora of West Bengal Vol. I was done.

Compilation of 95 Red Data. sheets of Endangered species of Indian plants was completed.

As regards National Flora / Flora of India, re-visionary studies of the genera *Tetrameles*, *Pedilanthus* & *Cynadenum* were completed and revision of 106 species, of the other taxas were completed.

Evaluation of 3 less known useful plants of India was completed.

Identification and enumeration of 725 species were completed for the flora of South Western Ghats.

Checklist oil 227 species belonging to nine families were prepared, 150 species were studied in all respects for the flora of Sikkim.

Manuscript on the Mangroves of India was finalized and is being edited.

In collaboration with Geological Survey of India, study on geobotany of some selected area of Singhbhum district in Bihar was completed.

Compilation of information in respect of ethnobotanical study on the plants used by the tribals in

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Bankura district was completed and, manuscript was edited for publication.

Work on multiplication of some horticulturally imported orchid species like *Cymbidun* *Bulbephyllum* etc. through tissue culture was undertaken.

### ***Zoological Survey of India***

37 survey covering 72 districts in different states were conducted in Himalayan ecosystem, Tropical Rain Forest, Desert ecosystem, Wetland ecosystems. Surveys were also conducted in Renuka Sanctuary and Kanha National Park. State Surveys were also conducted in Karnataka, Kerala, Tamilnadu, Pondicherry, Bihar, Madhya Pradesh and Uttar Pradesh.

Two Surveys were conducted in Tripura to assess the Status of Capped Langur and Hoolock Gibbon.

Taxonomic Studies were conducted in Meghalaya, Tripura, Sikkim, Tanilnadu and Gujarat. 126 scientific papers dealing with various aspects of Indian fauna were published/sent for publication.

Fauna of India: Larval Tretratodes of India Pt. 11, Estuarine Ecosystem Series Pt. I were published.

The National Zoological Collections were enriched by the addition of 20,688 identified specimens pertaining to 2884 species. These include 124 new species.

Data pertaining to 1200 Registration Numbers of general collection of the National Zoological Collections was computerized.

## **ENVIRONMENTAL EDUCATION / TRAINING**

### ***Environmental Information System***

Environmental Information system Network strengthened its potential information base in the form of publication of reports, bibliographies, abstracts etc, as well as numerical data i.e. the Statistics related to environment for providing substantive information to its user groups. The ENVIS network responded to various requests for information on environment and related fields and during the year, 4,984 queries were responded. The four issues of 'Paryavaran Abstract' containing information about the environmental research in the Indian context were published. Steps are being initiated for networking the ENVIS Centres with the Focal Point for smooth and continuous to and fro information flow. During 1992-93, three new ENVIS Centres in the area of Desertification, Estuary, mangroves, corals, lagoons and environmental education have been set up by ENVIS as network partners. Various publications including the Annual Report of the Ministry were brought out during the year. More than 500 Indian sources engaged in the environmental related activities, were registered by ENVIS as National Focal Point of INFOTERRA / UNEP for inclusion in the International. INFOTERRA Directory of environmental sources published by UNEP.

### ***Seminar / Symposia / workshop:***

Various Universities, professional bodies, voluntary organizations, NGOs etc., were provided, financial assistance for organizing Seminars / Symposia / workshop etc., in the field of environment and its related areas. However, due to imposition of ban orders by the Government on this issue, all the requests received from such organizations could not be agreed to.

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

During the year 1992-93, the IGPP was awarded to Dasholi Gram Swarajya Mandal Chamoli and Shri S. P. Godrej, Bombay as organization and individual respectively for their significant contribution in the field of environment.

### ***National Museum of Natural History:***

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

- (i) New exhibits were developed and installed in the museum galleries.
- (ii) New interactive software relevant to digitized image documentation system and desk-top publishing for its display were developed as a part of second phase of computerization.

- (iii) Two temporary exhibition one on "Water Pollution" and the other entitled "Towards Green Villages" were set up with the help of the Centre for Science and Environment, New Delhi.
- (iv) Exhibition on "You and the Environment" in the Mobile Museum serviced schools, rural areas, army units etc. were organized.
- (v) Under the auspices of the Indo-US Sub-commission on Education and Culture, the NMNH played a partnership role in organizing X Workshop in its series on Environmentally Oriented National History Museums-Exhibits, Programmes and Public Services" held in different parts of India.
- (vi) The construction of the building for the Regional Museum of Natural History, Mysore was completed and plans and designs for two galleries of the museum were finalized.
- (vii) Projects Reports were prepared, and finalized for setting tip of regional museums of natural history at Bhubaneswar and Bhopal.

### *Centres of Excellence*

The Centre for Environment Education, Ahmedabad, conducted the following activities during the year:

- An eight month training programme in environmental education was completed.
- An initial concept to develop "Eco-mark" for environment friendly products manufactured and marketed in the country has been prepared.
- Development of an interpretation programme at the Sultanpur National Park in Haryana was undertaken.
- Two publications in regard to the U.N. Conference on Environment and, Development were prepared.
- CEENFS News Letter was continued to, be published and a series of books and monographs on environment and development were brought out.

The C.P.R. Environmental Education Centre, Madras, continued its activities to spread awareness and interest among the public including voluntary workers, educators, women, farmers, youth and children on all aspects of environment and ecology with the objective of promoting conservation of nature and natural resources. The Centre undertook the following activities.

- Organization of exhibitions on birds and trees of Madras.
- Training programmes for NGOs and rural workers, students and teachers from Andhra Pradesh and Tamil Nadu.
- A survey was carried out for detecting the noise level in three major places in Madras city.
- Development of an. advanced water test kit to test 20 parameters has been undertaken
- Six selected districts as well as the local NGO, groups have been identified to implement the various phases of the project on Wastelands Development undertaken by the Centre.

Ecological Research and Training Centre, Bangalore continued its activities during the year with the special attention to the following research Projects:

- Nursery experiments for propagation of selected, trees, shrubs and lianas.
- Vegetational change in Nilgiris during the period 1943-1985.
- Nesting cycles on the paper wasp.
- Dynamics of tree population in Mudumali sanctuary etc.

A number of research projects have been undertaken by the Centre for Mining Environment, Dhanbad in the areas of land use management, air quality, heavy road dust consolidation etc.

The Salim Ali Centre for Ornithology and Natural History, has initiated about eleven research projects on several aspects of ornithology and Natural History of other life forms in different parts of the country.

### ***National Natural Resource Management System***

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 the scheme. Out of these, 11 projects have been undertaken of which 8 projects have been completed. The remaining three projects are under various stages of completion. Recently five more projects covering the project areas on biosphere reserves, monitoring, wetland mapping and land use mapping of coastal regulation zone have been sanctioned during the year.

## **CONSERVATION**

Management action plans in regard to 3 wetlands viz. Kabar, Bhoj and Kanjli have been sanctioned.

A booklet on Wetlands, Mangroves and Coral Reefs has been published in collaboration with WWF-India to generate awareness about the importance and need for conservation of wetlands.

A workshop on Conservation and Management of Wetlands was held in May, 1992 in which wetland functionaries from the Central and State Governments participated.

Management action plans in regard to four, Mangrove areas viz. Sunderbans in West Bengal, Coondapur in Karnataka, Goa, Achra / Ratnagiri in Maharashtra have been sanctioned.

A film entitled 'Man and Mangroves' is being made in collaboration with Film Division, Ministry of Information and Broadcasting.

Management action plans have been finalized for Biosphere Reserves.

A National Committee on Biosphere Reserve has been set up in place of the existing Management Councils for individual Biosphere Reserve.

Meetings of Research Committee for Gulf of Mannar and Nanda, Devi Biosphere Reserves were convened.

## **RESEARCH & DEVELOPMENT**

During 1992-93, 50 new projects were sanctioned and 18 projects were completed under the three major research schemes viz. Man and Biosphere programme, Environmental Research Scheme and the Integrated Action Oriented Research Demonstration and Extension Programmes on-Eastern and Western Ghats.

### ***G.B. Pant Institute of Himalayan Environment and Development***

During 1992-93 upto November, 1992, 3 research projects were initiated by G. B. Pant Institute of Himalayan Environment and- Development in thrust areas identified by Science Advisor-y Committee of the Institute. In addition, 16 ongoing projects continued to operate Annual day of the Institute was, celebrated on 14th September, 1992 and eminent scientist Dr. T. N. Khushoo delivered the G. B. Pant Memorial lecture on the theme of Himalayan Biodiversity.

## **PREVENTION & CONTROL OF POLLUTION**

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

- (i) During 1992-93, industrial estate survey has been initiated for eight states. By March, 1993, survey would be completed for 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) It has been proposed to undertake thirteen categories of industries for developing liquid effluent / gaseous emission standards. Under ECOMARK Scheme, Central Pollution Control Board has developed draft criteria products.
- (iv) Training courses on Hazardous Waste Characterization, analysis and disposal of waste, sampling and analysis
- (v) Central Pollution Control Board has proposed to carryout indepth pollution control studies in 90 industries falling under 17 categories of industries identified by the Government. Studies of about 40 to 50
- (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 these are currently at various stages of installation.

### ***Environment Policy & Law:***

The National Environment Tribunal Bill, 1992 has been introduced in the Lok Sabha on 18 August, 1992 and is due for consideration and passing in the Budget Session of the Parliament of 1993. Amendment to certain provisions of the Environment (Protection) Act are being processed. Two projects on biotechnology are also being processed. The Environment Friendly Scheme has been started in the financial year 1992-93 and will continue for the whole of Eighth Five Year Plan.

### ***Environmental Audit***

A Scheme for Environmental Audit has been approved during 1992-93. Environmental Audit 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 all 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 Board beginning 1993. 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 World Bank Industrial Pollution Control Project.

The new scheme also, provide for adoption of clean technologies by Small Scale Industries (SSIs) through assistance for education and training of (SSIs) through Small Industry Development Organization - an apex body of Development Commissioner, SSI, Ministry of Industry. Through information will be made available to the SSIs regarding adoption of clean technologies.

### ***Hazardous Substances Management***

- (i) The Red Book for Crisis Management has been revised to update name, address and telephone numbers. Duties have also been specified.
- (ii) Preparation of off-site plan for 9 districts is in progress. A meeting was held with the Consultants and preliminary reports for 3 districts have been received.
- (iii) Draft Manual on Emergency Preparedness for chemical disasters has been prepared and is under circulation for comments.

(iv) 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 have been circulated to the concerned agencies for implementation.

(v) Inter-departmental review meetings were held to promote utilization of flyash based products, The, State Governments have been requested to promote the use of flyash in Government construction work.

## **IMPACT ASSESSMENT**

Out of 247 projects appraised during the year in various sectors, 101 projects were granted environmental clearance, 29 projects were rejected and additional information has been sought for the remaining projects.

2. The Ministry have sanctioned a project study on Carrying Capacity of Doon Valley by National Environmental Engineering Research Institute at a total cost of Rs. 1.00 crores.

3 A project study on Carrying Capacity of National Capital Region is a coordinated project being considered for sanction by the Ministry at a cost of Rs. 2.09 crores.

4. Under Indo-Dutch Programme, the Department conducted one Policy Level Seminar in April, 1991 wherein Chief Secretaries of the State Governments and Chief Executives of the Public Sector Undertakings took part on internationalization of environmental impact assessment in development activities. In regard to the programme on training, workshops, three workshops were held on industrial siting and land-use planning.

## **INTERNATIONAL CO-OPERATION**

The Ministry of Environment and Forests is the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Cooperative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMDD) 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 organizations. 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 Migratory Species, Ramsar Convention on Wetlands and the Basel Convention on Trans-boundary Movement of Hazardous Substances. These international conventions / agreements are being looked after by respective specialized Divisions. However, IC Division is looking after Vienna Convention and the Montreal Protocol on substances that deplete the ozone layer as well as international negotiations on environmental issues.

The United Nations Conference on Environment and Development was held in Rio de Janeiro, 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 actively participating in the deliberations of the inter governmental panel on Climate Change (IPCC). India also signed the Global Conventions on Climate Change during the Rio Conference.

During the year, India acceded to the amended Montreal Protocol on Substance 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.

Some bilateral co-operation projects taken up with various countries are as follows:

- (i) Internal Training unit in Tamil Nadu Pollution Control Board – A proposal for an International Training Unit to be established within the existing Pollution control Boards for training all the professional staff in pollution control, effluent treatment in small-scale, medium and large units has been forwarded to the Department of Economics Affairs (DEA).
- (ii) Restoration of Hill-lakes in Tamil Nadu – A proposal of Tamil Nadu Government for Danish assistance for cleaning up Ooty and Kodaikanal lakes has been proposed for Danish Assistance. The proposal also envisages training of technical personnel in Tamil Nadu Pollution Control Board in Denmark.

## **AUSTRALIA**

A project for taking up eco-restoration of Hussain Sagar lake in Hyderabad has been proposed to be taken up. This is under examination.

## **CANADA**

Under India / Canada Environment Facility Project for the CIDA, Memorandum of Understanding between Government of Canada and Government of India has been signed to enhance the capacity of Indian institutions to promote and deliver sustainable development programmes addressing the environment. The project involves a Canadian contribution of Commodities worth Can. \$ 72 million for supporting projects / programmes in India's environment and forestry sectors. The programmes under this facility will be in accordance with the priorities laid down in the National Conservation Strategy and

Policy Statement of Environment and Development, the Policy Statement for Abatement of Pollution and the National Forest Policy, 1988. Presently there are two projects in the pipeline viz. (I) Eco-restoration of Chilka Lake, and (ii) Tree Growers Cooperative Projects. These projects under Canadian assistance will be implemented through NDDDB and IFFCO.

## **DENMARK**

Under the Indo-Danish bi-lateral programme, the following projects are under consideration:

- (i) Internal Training Organization in Karnataka Pollution Control Board. – DANIDA has offered to support a project for improvement of the capabilities of personnel involved in Pollution control activities, through Karnataka Pollution Control Board.
- (ii) The Environmental Master Plan in South Kanara District - DANIDA has made a proposal for evolving a Master Plan for South Kanara District in Karnataka. The proposal envisages, an integrated environmental management of the district taking into account the socio-economic and environmental profile of the area.

## **EUROPEAN COMMUNITY**

Indo-EC Cooperation Programme.-Greening of Aravallis in Haryana : In the year 1999, the EFC granted 23.3 ECU million for the project. The total outlay on the project in the field has been placed at Rs. 41.15 crores and it involves massive afforestation of common and waterlands in Haryana. The project commenced in 1991 and Rs. 3 crores has been spent for the preparatory work relating to the afforestation programmes. It is envisaged that the Indo-EC Cooperation will expand once the partnership Agreement for Cooperation and Development between EC and India comes into effect.

## **GERMANY**

The Government of Germany provides about DM 85 million annually to India under the Capital Aid Programme for assistance to, Rural Development and Environment Sectors. Of this, DM 15 million are earmarked for projects in forestry and environment sector.

2 The on-going / pipeline projects are as follows:

- (i) Strengthening of Pollution Control Laboratories: The 1st phase of the project started in April, 1986 with the objective to improve the facilities in the Central and State Pollution Control Board Laboratories by providing equipments, training courses and through short term consultancies. Besides organisation of workshops / seminars in India, short term consultancy missions for 19 topics were arranged for developing guidelines for laboratory management, analytical quality control, EIA and environmental planning. After phase I concluded in April, 1989, the project was extended till 1992 to complete the unfinished work. German assistance for this phase is DM 5.35 million. Meanwhile, steps have been initiated for formulation of Phase II of the project.

(ii) Integrated Development of Changar Area in Himachal Pradesh : The FRG assisted project for development of Dhauladhar area in Himachal Pradesh was completed in 1989 and the evaluation mission felt entirely satisfied with the performance of the project.

Based on consultation with the evaluation mission for Dhauladhar Project, a similar project for the adjoining Changar area in Himachal Pradesh with an outlay of Rs. 18.71 crores was referred for German Assistance in 1990. The Government of Germany has earmarked DM 10 million for the project. The project is under negotiation.

## **JAPAN**

### ***General Background:***

Japan has been steadily increasing its Official Development Assistance (ODA) in the environment sector through technical and financial cooperation. Environmental consideration have been integrated into Japanese assistance programme.

Following projects in the Environment and Forestry sectors have been taken up under OECF assistance:

(i) Afforestation & Pasture Development along Indira Gandhi Canal in Rajasthan: The project started in 1991 and is expected to be completed by March, 1995. Japan is assisting the project under an OECF loan. The main objective of this project is protection of canal, agricultural fields, etc. from the desert sands and to meet the local needs of fuel and fodder which are very scarce in the region. Besides, the project would also provide employment to the local people. The total cost of the project is Rs. 107 crores, 85 per cent of which will be Japanese assistance under OECF loan. An expenditure of Rs. 5.97 crores has already been incurred, and an area of 5,662 ha. has been covered under the project.

(ii) Afforestation Project for Aravalli Hills (Rajasthan): The main objective of this project is to check desertification and restore ecological status by reafforestation and also to increase production of fuelwood, tree, fodder, timber, etc. to meet the local needs. The project envisages an outlay of Rs. 167 crores and this assistance would be provided by Japan under OECF loan. The project agreement was signed in January, 1992, and the project has been launched.

(iii) Yamuna Action Plan: After a series of Government of Japan and OECF Missions, a soft loan of 17.77 billion Yen (equivalent to Indian Rs. 402 crores) has been pledged by the Japanese Government for Pollution abatement of the river Yamuna in 6 towns of Haryana and 8 towns of Uttar Pradesh, besides Delhi. The programme comprises - (a) Sewerage works which include Interception and Diversion schemes and Treatment Plants, and (b) Non-sewerage works such as Low Cost Sanitation, Electric Crematoria, Afforestation, bathing ghats, etc.

## **THE NETHERLANDS**

Among the on-going programmes, the Netherlands have provided an assistance of Guilders 50 million for 19 schemes in Kanpur-Mirzapur under the Ganga Action Plan. A programme for training in Environment Impact Assessment was taken up in 1089 which will be completed later this year. Another project on bio-monitoring of river Yamuna will be completed during this year, The Netherlands have also provided water quality monitoring stations at Wazirabad and Okhla. Among the major projects in the pipeline are utilisation and disposal of flyash, pollution prevention in fertilizers, textiles, leather and paper sectors, Strengthening of Kerala Pollution Control Board, Kallada River Action Plan, bio-monitoring in Chaliyar in Kerala and in Tunghabhadra in Karnataka etc. It is also proposed to take up a project for support to Environment NGOs and Pollution perception studies.

## **CIS**

A proposal for collaboration with the CIS Republic of Ukraine is under consideration. The Ministry of Environment and Forests has requested the Ministry of External Affairs to apprise the Government of Ukraine of our priorities and programmes in the areas of conservation, pollution control, forestry and our desire for cooperation with this CIS Republic.

## **USA**

Under the USIF Programme, a number of areas for funding were identified in the meeting of the Working Group on Environment and Ecology held in New Delhi in October, 1991. The areas identified for collaborative research between India and USA are:

- (i) Environmental Information Exchange.
- (ii) Pollution Prevention.
- (iii) Health and ecological Risk Assessment.
- (iv) Biochemical Processes and Application of Modeling.
- (v) Conservation and Management of Wetlands.
- (vi) Conservation of Cultural and Biological Diversity.
- (vii) Human and Institutional Resource Development.

At present, the various project proposals drawn up by the different Indian Research Institutes are being considered by the US side for funding in the forthcoming USIF funding cycle for the period 1992-96.

In addition, USAID is co-funding the National Agriculture Organisation, UNDP, WHO, UNEP, EEC, Forestry Project with IDA in the States of Himachal Pradesh, Uttar Pradesh, Rajasthan and Gujarat.

The Ministry and its agencies have undertaken projects with the collaboration of world Bank, food and Agriculture Organization, UNDP, WHO, UNEP, EEC, SAARC, Canada, USA, Sweden, Norway, Japan, Denmark, UK, Netherlands and Germany, etc.

Projects in the Environment and Forestry Sectors being executed with the assistance of world Bank and other donor agencies are as under:

Sr. No.	Name of the Project and Duration	Donor Agency / Agencies	Progress
1	Social Forestry Project, Kerala (1984-85 to 1992-93)	World Bank	** O: Rs. 59.91 crores ** E: Rs. 61.82 crores till 12/91
2	Forestry Development Project, West Bengal (1992-93 to 1996-97)	World Bank	O: Rs. 114.7 crores E: Just commenced.
3	Forestry Sector Project, Maharashtra (1992-93 to 1997-98)	World Bank	O: Rs. 431.51 crores E: Just commenced.
4	Ganga Action Plan – STPs in Kanpur, Haridwar, Allahabad and 12 Pumping Stations in West Bengal (1987-96)	World Bank	O: Rs. 86.00 crores E: Rs. 123 crores (approx.)
5	Industrial Pollution Control Project (1991-97)	World Bank	O: Rs. 404.56 crores E: Rs. 123 crores (approx.)
6	Ganga Action Plan, Integrated Sanitation Works in Kanpur and Mirzapur (1987-93)	The Netherlands	O: Rs. 60.00 crores E: Rs. 18.59 crores till 5/92
7	Environment Impact Assessment work Shops Phase I (1989-92)	The Netherlands	O: Rs. 0.15 crores E: Rs. 0.12 crores till 1992
8	Social Forestry Project, Orissa (1988-89 to 1992-93)	Swedish International Development Agency (SIDA)	O: Rs. 85.40 crores E: Rs. 59.87 crores till 12/91
9	Social Forestry Project, Orissa (1988-89 to 1992-93)	SIDA	O: Rs. 78.34 crores E: Rs. 49.92 crores
10	Dungarpur Integrated Wasteland Development Project, Rajasthan (1992-93 to 1996-97)	SIDA	O: Rs. 28.14 crores E: Just commenced
11	Strengthening of Indian Institute of Forest Management, Bhopal (1988-93)	SIDA	O: Rs. 3.18 crores E: Rs. 0.70 crores
12	Environmental Protection, Training and Research Institute, Hyderabad (1991-96)	SIDA	O: Rs. 6.00 crores E: Just commenced
13	Afforestation of Aravalli Hills, Rajasthan (1992-93)	Japan	O: Rs. 166.90 crores

	to 1996-97)		E: Project just commenced
14	Afforestation along Indira Gandhi Canal, Rajasthan (1990-91 to 1994-95)	Japan	O: Rs. 107.50 crores E: Rs. 5.87 crores upto 12/91
15	Aravalli Hills Afforestation, Haryana (1990-91 to 1997-98)	EEC	O: Rs. 48.15 crores E: Rs. 7.19 crores till 12/91
16	Strengthening of Central / State Pollution control Board Laboratories (1989-92)	Germany	O: Rs. 2.3 crores E: Rs. 2.00 crores
17	Ganga Action Plan Technical Assistance and Equipments (1986-1992)	UK	O: Rs. 4 crores E: Outlay almost exhausted
18	National Social Forestry Project (Gujarat, Himachal Pradesh, Uttar Pradesh and Rajasthan (1985-86 to 1992-93) )	World Bank / USAID	O: Rs. 387.29 crores E: Rs. 529.45 crores upto 12/91
19*	Ecology of Endangered Grasslands and their Fauna (1990-95) ENHS	USA	O: Rs. 0.54 crores
20*	Ecology of Indian Elephant (1987-1992) BNHS	USA	Rs. 0.14 crores
21*	Faculty Development of Wildlife Institute of India (1988-93)	USA	O: Rs. 0.87 crores
22*	Ecology and Large Carnivores of Nagarhole National Park (1988-1993)	USA	O: Rs. 0.10 crores

\* Expenditure figures maintained by respective Institutes. Progress of the projects indicates that the research activities envisaged are being carried out according to the objectives and scope.

\*\* Outlay in crores of Rupees

E – Expenditure in crores of Rupees

Expenditure is in excess of outlay at Sl. No. 1 and 18 due to changes in exchange rates.

## GANGA ACTION PLAN

As on April, 1992, 192 out of 261 schemes sanctioned had been completed. During 1992-93, 3 schemes have so far been completed and another 25 schemes are targeted to be completed by March, 1993. The following table shows the number of schemes completed in the three states:

Schemes	U.P.	Bihar	West Bengal	Total
Sanctioned	106	45	110	261
Completed	80	35	77	192
Under progress	26	10	33	69

Following table shows category-wise number of schemes so far completed in various states:

Category	Uttar Pradesh	Bihar	West Bengal	Total
Interception and diversion schemes	31	15	14	60
Sewage treatment plants (STPS)	6	0	1	7
Low cost sanitation (LCS)	11	7	22	40
Electric crematoria	2	7	15	24
River front facilities	7	3	24	34
Other schemes for biological regeneration of the river, etc.	23	3	1	27
Total	80	35	77	192

The target set under the GAP phase I is to create a capacity to intercept, divert and treat 873 mld of domestic sewage. As on 30-11-92, a capacity to intercept and divert 485 mld of municipal sewage and treat 223 mld has been created. The completion of most of the low cost sanitation schemes and electric crematoria has helped in reducing river water pollution.

Checking of industrial pollution of river is yet another area of concern. Accordingly, 264 polluting Industries have been identified along the Ganga which discharge their effluent into the river as its tributaries.

Out of these, 68 grossly polluting units have been monitored for pollution abatement. In 1985 only 14 units had effluent treatment plants. Presently 43 units have effluent treatment plants, 8 are in the process of installing them, 10 units have been dosed down and prosecution has been launched against 9 units. A capacity to treat 210 mld of industrial effluent out of the estimated quantity of 260 mld has been set up.

An inventory of 590 industrial units covering river Ganga and its major tributaries in the States of Uttar Pradesh, Bihar and West Bengal to be included in GAP Phase-11 and 254 industrial units situated along 37 polluted river stretches identified under National River Action Plan has been prepared. Close interaction with CPCB and respective State Pollution Control Boards is on to finalize the inventory and to draw up a Schedule for future monitoring of these industries for pollution abatement programmes.

The water quality has been observed to improve discernibly in towns where pollution abatement schemes wholly or in part have been commissioned, i.e., Rishikesh, Haridwar, Allahabad, Varanasi, Patna and Howrah. It has also been observed that both the Dissolved Oxygen and Bio-chemical Oxygen Demand are meeting the permissible limits for bathing except at Kanpur.

A project of rearing of the scavenging turtles, which was initiated at Varanasi, is continuing. A large number of such turtles have already been released in the Varanasi Sanctuary area and about 30,000 turtles are in captive rearing stage.

One unit of Rotating Biological Rope Contractor Process commissioned at Swarg Ashram, Rishikesh is on trial to assess the feasibility of repeating the effort at other places.

The technology of 'Afforestation with Raw Sewage' developed by the Central Soil Sanitary Research Institute, Karnal, has been applied under the Action Plan at Buxur and Varanasi. A Plan has been chalked out to popularize the technology by way of arranging deliberations by the experts in various towns where the schemes under GAP are under implementation.