MSS/RM/ 8231
18 December 1995

Dr. N. Bhaskara Rao
Member - Convenor
Social Audit Panel
Ministry of Environment & Forests
Room No.106, Paryavaran Bhawan
CGO Complex, New Delhi - 110 003.

My dear Dr. Bhaskara Rao,

I thank you very much for your kind letter dated 14 December. The minutes have been prepared very well.

I enclose a copy of our invitation to the workshop on an Implementation Framework for Farmers' Rights scheduled to be held in Madras from 15-18 January, 96. Please request the Chairman and all Members to participate, since this is very relevant to our work on social equity.

With warm personal regards,

Yours sincerely,

M.S. Swaminathan

Encl: as above.

DESPATCHED
DATE 19/12/95

SOCIAL AUDIT PANEL
Ministry of Environment & Forests

Dr. N. Bhaskara Rao
Member - Convenor

December 14, 1995.

Dear Dr. Swaminathan,

Kindly find enclosed the draft minutes of our day long deliberations on 11.12.1995 at Paryavaran Bhavan.

I am still awaiting to get confirmation regarding December 21 meeting at Bombay. Also enclosed are the hard copies of the presentations made by Shri S.C. Dey, on forestry issues.

With kind regards, look forward to meet you here on 19th Dec.

Yours sincerely,

Bhaskar

(N. Bhaskara Rao)

Dr. M.S. Swaminathan
Chairman
M.S. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras-600 113.

Room No. 106, Paryavaran Bhawan, CGO Complex, New Delhi - 110 003 *Telephone: 4362016*

Social Audit Panel

MINUTES OF THE MEETING OF THE SOCIAL AUDIT PANEL HELD ON 11.12.1995 AT PARYAVARAN BHAVAN.

....

The Panel meeting was chaired by Justice R.S. Pathak and attended by Dr. M.S. Swaminathan, Shri R. Rajamani and Dr. N. Bhasakara Rao. Shri Abid Hussain could not attend the meeting as he was busy elsewhere.

Chairman Justice Pathak said at the outset that the Panel's concern is not limited to monitoring the activities of the Ministry and that environment is not the concern of the Ministry alone rather it is of everyone's business. He also said that the Panel's concern is not to endorse Ministry's programmes rather to look at them dispassionately and take the perspective from outside the Ministry as well. Shri R. Rajamani mentioned the role played by State Governments in the process, especially in implementation, is significant.

Dr. M.S. Swaminathan at the outset suggested that the panel should update itself on the recent Convention on Biodiversity at Jakarta as there has been a lot of concern expressed by NGOs in this regard. Thereupon Ms. A.K. Ahuja, Joint Secretary, who attended the Jakarta Conference, was requested to brief the Panel. Ms. Ahuja said that there was much clarity at the Jakarta Convention on the equity and access issues but there was more thrust on coastal and marine eco-systems. On IPR related issues and funding for in-situ conservation by GFP, there was not much clarity. A lot of discussion took place on compensation for collections (ex-situ) in gene banks but there were doubts on pressing for any solution relating to past collections. But in respect of all future use of existing collections, the Convention would apply. The Panel also took note that one of the reasons for public concern, apprehension and anxiety is due to lack of information in the public purview and also emphasized the need for transperency in this process and felt that people's participation could be expected only when access to information is ensured. With regard to the proposed legislation on protection of breedest farms rights, the ones being initiated by the Agriculture Ministry and by the Environment and Forests should be compatible. The Panel also felt that India should set examples on "Equity and Benefits" issues to other developing countries in this regard so that the confusion regarding IPR is sorted out.

Dr. Swaminathan at the outset said that ecological protection to the country is as important as the national security. He also expressed his concern that the projects submitted to the Ministry on wastelands, mangroves etc. and such other critical areas by responsible agencies should be promptly responded. He also expressed his concern about the handing over important lakes by State Governments to private industries thereby enabling commercial use of lakes.

Field visits

The Panel decided to visit Bombay on December 21 and meet the as many "stake holders" including the NGOs and visit Madras on 16th and 17th for which Dr. M.S. Swaminathan has extended his invitation for the FAO meet on TRIPS at the M.S. Swaminathan Foundation and also to meet the concerned officers, agencies and NGOs from the southern States. The Panel also decided to visit Bhopal, on January 12 and Guwahati on 27th and 28th of January, 1996.

Bombay	December 21, 1995
Bhopal	January 12, 1996
Madras	January 16-17, 1996
Guwahati	January 27-28, 1996

Immediate concerns

The Panel decided to concentrate on (a) forestry issues and (b) information, awareness and people's involvement related issues which cut across both environmental and forestry concerns. The Panel would work towards an interim report in February, 1996.

Backgrounders

The Panel felt that the Ministry should be requested to keep the Chairman and Members of the Panel informed about any assessment, appraisal, evaluation research studies, committee reports and related reports on forestry environment and related issues.

Presentations

Thereafter, the Panel was given a presentation by the senior officials of the Ministry on forestry and information/awareness issues in the Conference Room.

Forestry

At the outset Mr. S.C. Dey, Addl. IGF, expressed his concern that after launching of JRY, performance on forestry has come down as the special emphasis on forestry on poverty elevation programmes no longer exist. He also felt that conservation has not been a priority in the Government and that there has not been enough understanding of its importance and implications in the larger context. He also cited the example to bring out how little is being spent on environment and forestry activities in the Government. Madhya Pradesh where the Government gets a revenue of Rs.500/- crores from forest resources, it hardly allocated under its development plan Rs. 50 crores.

Mr. N.K. Joshi, DG, ICFRE, Dehradun, in his detailed presentatiofn about forest research activities observed out that forest productivity in the country has come down and the forests are being over-exploited and yet under utilised.

Mr. S.K. Mukherjee, Director, WII, in his detailed presentation traced the origins of wildlife conservation movement in the country and brought out that inadequate information about its implications and inter-connectivity with environment is one of the problems and called for multi-sectoral approach.

Summing up the three presentations, Dr. Swaminathan pointed five major areas that need to be concern about :

1. Land-use policy
   a) Forestry
   b) Forest conservation
   c) Community requirements
   d) Commercial interests

2. Institutional structures and their development; role of Panchayat Raj and Nagar Palikas

3. Public education and participation; right to information in that process

4. Review and update of legislations and initiatives;
The need to curb greed particularly, commercial greed against the genuine needs of poor and unorganised

5. Need to build up technical and managerial capabilities apart financial resources

6. More appropriate environment assessment practices - he brought out that trade-off and options are not brought out in the environemnt impact studies.

Thereafter, Mr. Alok Jain, Joint Secretary discussed about environment education and informed the Panel that the theme for National Environment Awareness Campaign for 1996 would be on "Woman and Environment". He also informed that 2000 Environment Clubs and 130 District level Paryavaran Vahinies have been constituted and the members of the Vahinies are being trained and resource material is being supplied to them. He also informed about Centres of Excellence at different locations and about various Environment Puraskars. Thereupon, Mr. Harjit Singh, Sr. Adviser made presentation on ENVIS Centres and how the 20 ENVIS Centres are functioning around the country. He also informed the Panel that the Ministry is adding more Centres during the current year to expand its scope.

Mr. V. Anand, Additional Secretary, summed up that all these activities are interoven with anti-poverty programmes and should be viewed in the context of total funds available with the Government.

Thereupon, the Panel met with representatives of 9 distinguished NGOs operating from Delhi, who are invited to meet the Panel. At the outset, Chairman Justice Pathak explained the objectives of Social Audit Panel and highlighted the need of NGOs assistance and involvement as much as that of the Ministry in making the environmental concerns a 'mass movement'.

Dr. Swaminathan exhausted the right to information as fundamental and that without ensuring this, no sustainable development can be ensured. He also brought out the need to strengthen the involvement of "stake-holders" at all levels, both interms of policy formulation and programme implementation.

Mr. Shekhar Singh, IIPA, was critical of the process and practices of environment impact assessment invogue and lamented that related information more often is not shared even with NGOs and transperency is not evident often to the extent of making cynical of Government's approach.

He also observed that the Environment Ministry is more often viewed in the public as an adversory, as much as the Finance Ministry, as a result of its limited outlook and that real choices and options are not being evaluated and, in any case, compromises are to obvious in many decisions of the Ministry.

He also pointed out that people's participation is closely linked to empowerment particularly of information. He was critical of "sanitised information" approach and reminded the need for integrated and open approach of various sectors to achieve the overall environmental objectives.

Dr. Ashok Khosla of Development Alternatives called for new type of information system to achieve the objectives of Environment Movement and recalled the assurance of the Minister that public hearings will be conducted before any decision is taken on major projects by the Ministry. He also suggested that impact assessment should not be done by experts alone but people who are affected locally should also be involved. He suggested that nurturing the capacity of NGOs is important so that they could be helpful in achieving the overall objectives and that NGOs should be viewed as partners not as adversories.

Mr. N.D. Jayal, INTACH, said that a political will is lacking and sited the example of Kerala where large forest areas are being given out to individuals. He also cited the example of Andaman where despite high level decisions contrary factories are being allowed.

He also questioned the methodology of environmental assessment and the negative implications of the current practices and brought out that no consistency is evident in this methodology nor any positive impact.

Mr. S.S. Rizvi, SPWD, talked about the joint forest management approach and brought out the need for identifying success stories in various parts of the country about wasteland development and publishing them to encourage replication of similar efforts elsewhere and he brought out the need for documenting the success stories.

Mr. Gautam Vohra, DRAG, pointed out the inaction of the Government and cited the example of ridge (in Delhi) as a key example of citizen alertness and the role of Supreme Court in this regard.

Mr. A. Mathur, TERI, brought out the need for enhancing the process and methodology of choice-making in the Government regarding various issues and options to do with environment and brought out that while decisions are made technical people, implementation is open left for public participation. He called for change in the institutional structures in this regard. He also called for the need to bring out trade-offs to make people understand rather than allowing emotions dictate. He suggested analytical approach. He also called for training Panchayatas by successful panchayat and cited the experience of TERI in Haryana.

Shri Ashish Kothari, Kalpavriksh felt that the creditability of the Ministry is one of the concerns and he cited that many damas cleared by the Ministry are in violation of the norms and yet there is no action taken by the Ministry despite powers with it. He suggested the need for improving the creditability of the system and to ensure that poor would not look at the environment as anti-poor programmes while suggesting social sansitivities with various legislatives initiated, referred to the example of ~~laws~~ the proposed Forest Act is viewed more as repressive and that wildlife programme is viewed as imposed from above as if 'Government Tigers' are being saved.

Ms. Anna Purna, TERI, showed two-minute Environment Film made by TERI and being shown on Doordarshan for some time as an example how complex issues to do with the environment could be effectively shown on TV.

In conclusion Dr. N. Bhaskara Rao, Member-Convenor, thanked the NGO representatives and informed that the Panel would like to have more interactions with NGOs in Delhi as well as during its visits to States and requested them to assist the Panel in its endeavours with whatever inputs they could provide.

Presentation by
S. C. DEY.
Addl. IGF
11-12-95
(20 sheets)

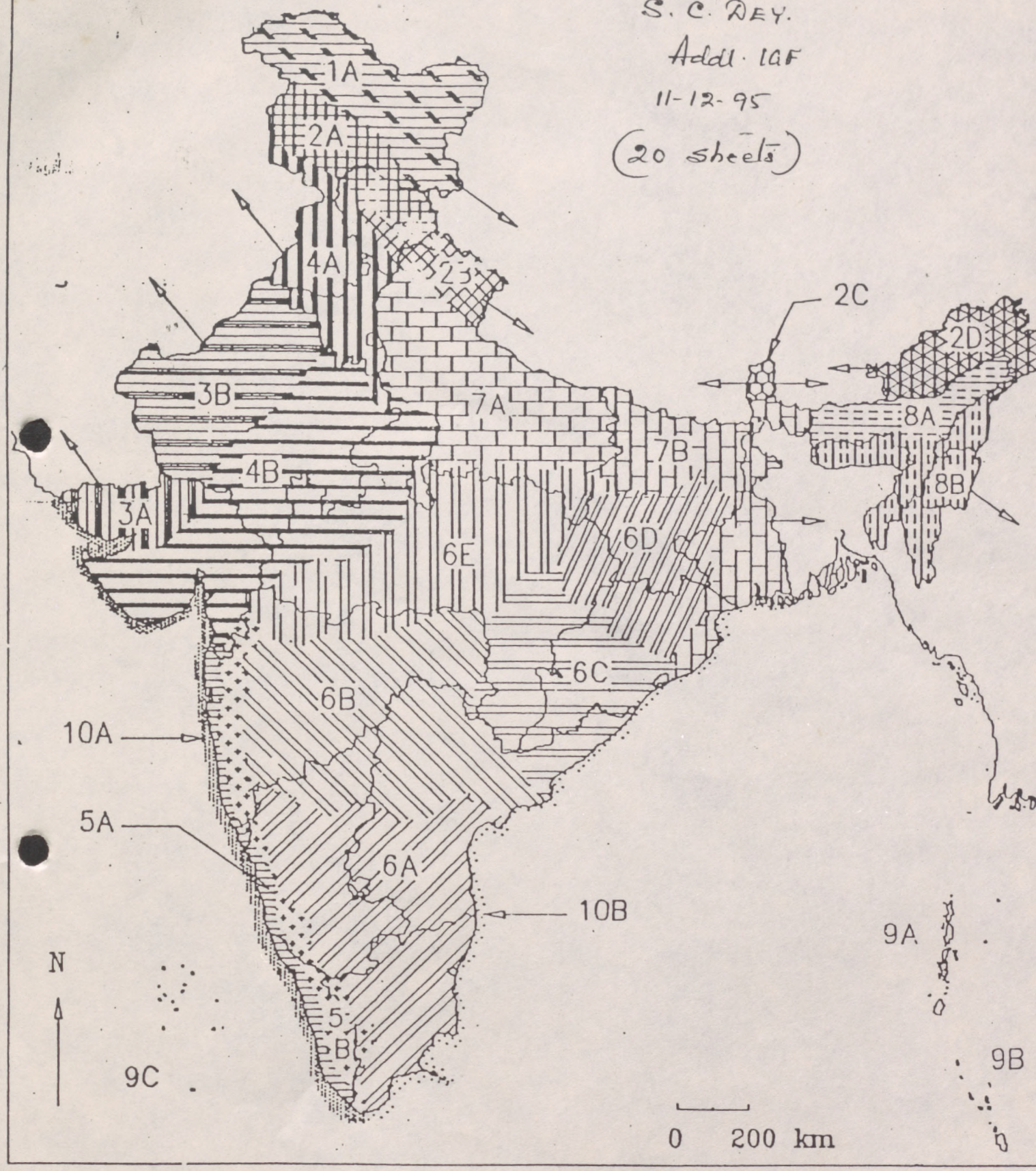


Fig. 1 THE BIOGEOGRAPHIC CLASSIFICATION OF INDIA

Legend to Fig. 1 : THE BIOGEOGRAPHIC CLASSIFICATION OF INDIA

Biogeographic Zone		Biotic Province	
1.	Trans-Himalayan	1A	Tibetan
2.	Himalayan	2A	North West Himalaya
		2B	West Himalaya
		2C	Central Himalaya
		2D	East Himalaya
3.	Desert	3A	Kutch
		3B	Thar
4.	Semi-Arid	4A	Punjab
		4B	Gujarat Rajwara
5.	Western Ghats	5A	Malabar Coast
		5B	Western Ghat Mountains
6.	Deccan Peninsula	6A	Deccan Plateau South
		6B	Central Plateau
		6C	Eastern Plateau
		6D	Chhota-Nagpur
		6E	Central Highlands
7.	Gangetic Plain	7A	Upper Gangetic Plain
		7B	Lower Gangetic Plain
8.	North-East India	8A	Brahmaputra Valley
		8B	Assam Hills
9.	Islands	9A	Andaman Islands
		9B	Nicobar Islands
		9C	Lakshadweep Islands
10.	Coasts	10A	West Coast
		10B	East Coast

REVISED CLASSIFICATION OF INDIAN FOREST TYPES

I- MOIST TROPICAL FORESTS

GROUP I - TROPICAL WET EVERGREEN FORESTS
GROUP 2 - TROPICAL SEMI-EVERGREEN FORESTS
GROUP 3 - TROPICAL MOIST DECIDUOUS FORESTS
GROUP 4 - LITTORAL AND SWAMP FORESTS

II - DRY TROPICAL FORESTS

GROUP 5 - TROPICAL DRY DECIDUOUS FORESTS
GROUP 6 - TROPICAL THORN FORESTS
GROUP 7 - TROPICAL DRY EVERGREEN FORESTS

III - MONTANE SUBTROPICAL FORESTS

GROUP 8 - SUBTROPICAL BROADLEAVED HILL FORESTS
GROUP 9 - SUBTROPICAL PINE FORESTS
GROUP 10 - SUBTROPICAL DRY EVERGREEN FORESTS

IV - MONTANE TEMPERATE FORESTS

GROUP 11 - MONTANE WET TEMPERATE FORESTS
GROUP 12 - HIMALAYAN MOIST TEMPERATE FORESTS
GROUP 13 - HIMALAYAN DRY TEMPERATE FORESTS

V - SUB-ALPINE FORESTS

GROUP 14 - SUB-ALPINE FORESTS

VI - ALPINE SCRUB

GROUP 15 - MOIST ALPINE SCRUB
GROUP 16 - DRY ALPINE SCRUB

By Champion & SETH

EVOLUTION OF INDIAN FORESTRY

1806	Appointment of 1st Conservator of Forests
1842	First Teak plantations raised in Nilambur
1864	Constitution of Imperial Forest Service. -1st Inspector General of Forests
1894	1st National Forest Policy, - Enactment of Indian Forest Act, 1894.
1906	Establishment of Forest-research Institute
1927	Detailed Indian Forest Act, 1927
1952	2nd National Forest Policy,
1976 -	Forest brought under concurrent list.
1980	Forest (Conservation) Act, 1980
1984	Creation of the Ministry of Environment & Forests,
1988	3rd National Forest Policy.

SALIENT FEATURES OF NATIONAL FOREST POLICY, 1864

- State Forest were to be managed for public benefit.
- Forest situated in fragile areas were to be managed as Protection Forest
- Forest with valuable species were to be managed an commercial lines to generate revenue for States.
- Forest with inferior timber were to be managed for benefit of local population.
- Demand of land for agriculture and other uses were to be meet from forest areas.

SALIENT FEATURES OF NATIONAL FOREST POLICY, 1952

- One third of total land area of the country should be under forests.
- Forest were classified as (i) Production Forests (ii) Conservation (iii) Protection Forest and (iv) Village Forests. (v) Aesthetic & recreation
- Shifting cultivation was to be discouraged.
- Agriculture was given priority over forestry.

SALIENT FEATURES OF NATIONAL FOREST POLICY, 1988

- One third of total land area of the country should be under forest cover
- Environmental use of forests is to be given precedence over commercial use of forests.
- Active participation of local people is sought for protection and management of forests
- Agro and Farm forestry should be encouraged.
- Local right and concessions should be rationalised.
- Biodiversity of the country is to be conserved.
- Symbiotic relationship between forests and tribal people should be maintained.

STATUS OF FORESTS IN INDIA

(AREA IN MILLION HECTARES)

A.	RECORDED AREA OF INDIA ...	328.72	
B.	Recorded Forest Area...	77.00	= 23·4% of A.
	Reserve Forests ...	41.50	
	Protected Forests...	23.30	
	Unclassed Forests...	12.20	
C.	ACTUAL FOREST COVER ...	64.01	= 83·12% of B
	Dense Forests ...	38.56	
	Open Forests ...	25.02	
	Mangroves ...	0.42	

D. ANNUAL RATE OF RECESSION OF FORESTS

During 1960 - 75 @ 0.1 mill.hec./year

During 1976 - 86 @ 0.05 mill.hec./year

During 1987 - 91 increase @ 15000 hec./year

E. PER CAPITA FOREST AREA (ON ACTUAL COVER)

India	0.08 hec.
Highest in Arunachal Pradesh ...	10.88 hec.
Lowest in Haryana ...	0.004 hec.

Table 1.7
STATEWISE LEGAL CLASSIFICATION STATEWISE FOREST AREA

(Sq.kms.)

S.No.	State/UTs	Reserved forests	Protected forests	Others	Total
1	2	3	4	5	6
1.	Andhra Pradesh	50,075.29	11,978.76	1,672.35	63,720.40
2.	Arunachal Pradesh	15,321.35	7.79	36,210.86	51,540.00
3.	Assam	17,927.01	-	12,779.76	30,707.57
4.	Bihar	5,051.00	24,168.00	7.00	29,220.00
5.	Goa (Including Daman & Diu)	651.975	-	604.025	1,256.00
6.	Gujarat	13,763.00	1,021.31	4,602.81	19,388.00
7.	Haryana	229.47	1,072.15	385.64	1,687.26
8.	Himachal Pradesh	1,896.00	33,350.00	2,345.00	37,591.00
9.	Jammu & Kashmir	20,173.74	-	-	20,173.74
10.	Karnataka	28,610.53	3,932.17	6,102.86	38,645.56
11.	Kerala	9,152.11	-	2,070.20	11,222.31
12.	Madhya Pradesh	88,976.01	69,102.51	5,335.86	1,55,414.38
13.	Maharashtra	42,722.00	15,351.00	5,780.00	63,861.00
14.	Manipur	1,463.00	4,171.00	9,520.00	15,154.00
15.	Meghalaya	980.63	12.39	8,503.02	9,496.04
16.	Mizoram	7,127.00	3,568.00	5,240.00	15,935.00
17.	Nagaland	8,625.00	-	-	8,625.00
18.	Orissa	26,107.61	33,427.40	20.39	59,555.40
19.	Punjab	43.36	1,092.78	1,706.22	2,842.36
20.	Rajasthan	12,301.74	18,055.26	3,201.68	31,558.68
21.	Sikkim	2,650.00	-	-	2,650.00
22.	Tamilnadu	18,838.00	3,247.00	614.00	22,699.00
23.	Tripura	3,847.09	2,444.58	-	6,191.67
24.	Uttar Pradesh	36,151.55	1,060.45	14,289.53	51,501.53
25.	West Bengal	7,054.00	3,772.00	1,053.00	11,979.00
26.	Andaman and Nicobar	2,929.00	4,242.00	-	7,171.00
27.	Chandigarh	1.94	-	29.10	31.04
28.	Dadra & Nagar Haveli	203.08	4.40	-	207.48
29.	Delhi	42.00	-	-	42.00
30.	Lakshadweep	-	-	-	-
31.	Pondicherry	-	-	-	-
	Total	4,14,916.165	2,33,080.950	1,22,081.305	7,70,078.42

ESTIMATES OF FOREST COVER

YEAR	SOURCE OF DATA	YEAR OF DATA	FOREST COVER (sq. km)	OUTPUT
FIRST ESTIMATE (1987)	MSS	1981 - 83	6,42,041 (19.52 %)	1 : 1 MILLION SCALE VEGETATION MAPS
SECOND ESTIMATE (1989)	TM	1983 - 85	6,40,134 (19.47 %)	1 : 250,000 SCALE VEGETATION MAPS
THIRD ESTIMATE (1991)	TM	1985 - 87	639,182 (19.44%)	-DO-
FOURTH ESTIMATE (1993)	TM	1987 - 89	6,40,107 (19.47 %)	-DO-

FSI .995

COMPARISION OF 1987, 1989, 1991 AND 1993 ESTIMATES

	1987	1989	1991	1993
A. FOREST				
1. DENSE FOREST	3,61,412 (10.99)	3,78,470 (11.51)	385,008 (11.71)	385,576 (11.73)
2. OPEN FOREST	2,76,583 (8.41)	2,57,409 (7.83)	249930 (7.60)	250,275 (7.61)
3. MANGROVE	4,046 (0.12)	4,255 (0.13)	4244 (0.13)	4,256 (0.13)
T TAL FORESTS	6,42,041 (19.52)	640,134 (19.47)	6,39,182 (19.44)	640,107 (19.47)
B. SCRUB AREA	76,796 (2.34)	66,121 (2.01)	59,641 (1.82)	58,943 (1.79)
C. UN-INTERPRETED AREA	11,524 (0.35)	3,893 (0.12)	19093 (0.5	-
D. NON-FOREST	25,57,436 (77.79)	25,77,649 (78.40)	2569347 (78.16)	25,88,213 (78.74)

NOTE - FIGURES IS PARANTHESES INDICATE % OF THE TOTAL GEOGRAPHICAL AREA OF THE COUNTRY.

FSI 1995

(Sq.km.)

S. No.	State/UTs	Dense Forest (crown density) above 40%)	Open Forest (Crown density 10% to 40%)	Man-grove	Total Forest covered area
1	2	3	4	5	6
1.	Andhra Pradesh	25,008	21,870	378	47,256
2.	Arunachal Pradesh	54,510	14,151	-	68,661
3.	Assam	15,998	8,510	-	24,508
4.	Bihar	13,172	13,415	-	26,587
5.	Goa	995	249	3	1,247
6.	Gujrat	6,301	5,324	419	12,044
7.	Haryana	329	184	-	513
8.	Himachal Pradesh	9,565	2,937	-	12,502
9.	Jammu & Kashmir	10,953	9,490	-	20,443
10.	Karnataka	24,852	7,491	-	32,343
11.	Kerala	8,421	1,915	-	10,336
12.	Madhya Pradesh	95,537	39,859	-	135,396
13.	Maharashtra	25,680	18,024	155	43,859
14.	Manipur	5,307	12,314	-	17,621
15.	Meghalya	3,305	12,464	-	15,769
16.	Mizoram	4,238	14,459	-	18,697
17.	Nagaland	3,487	10,861	-	14,348
18.	Orissa	27,151	19,799	195	47,145
19.	Punjab	481	862	-	1,343
20.	Rajasthan	3,581	9,518	-	13,099
21.	Sikkim	2,395	724	-	3,119
22.	Tamilnadu	9,422	8,283	21	17,726
23.	Tripura	1,819	3,719	-	5,538
24.	Uttar Pradesh	22,965	10,996	-	33961
25.	West Bengal	3,362	2,705	2,119	8,186
26.	Andaman & Nicobar	6,567	91	966	7,624
27.	Chandigarh	4	1	-	5
28.	Dadra & Nagar Haveli	159	47	-	206
29.	Daman & Diu	-	3	-	3
30.	Delhi	12	10	-	22
31.	Lakshadweep	-	-	-	-
32.	Pondicherry	-	-	-	-
	Total	3,85,576	2,50,275	4,256	640,107

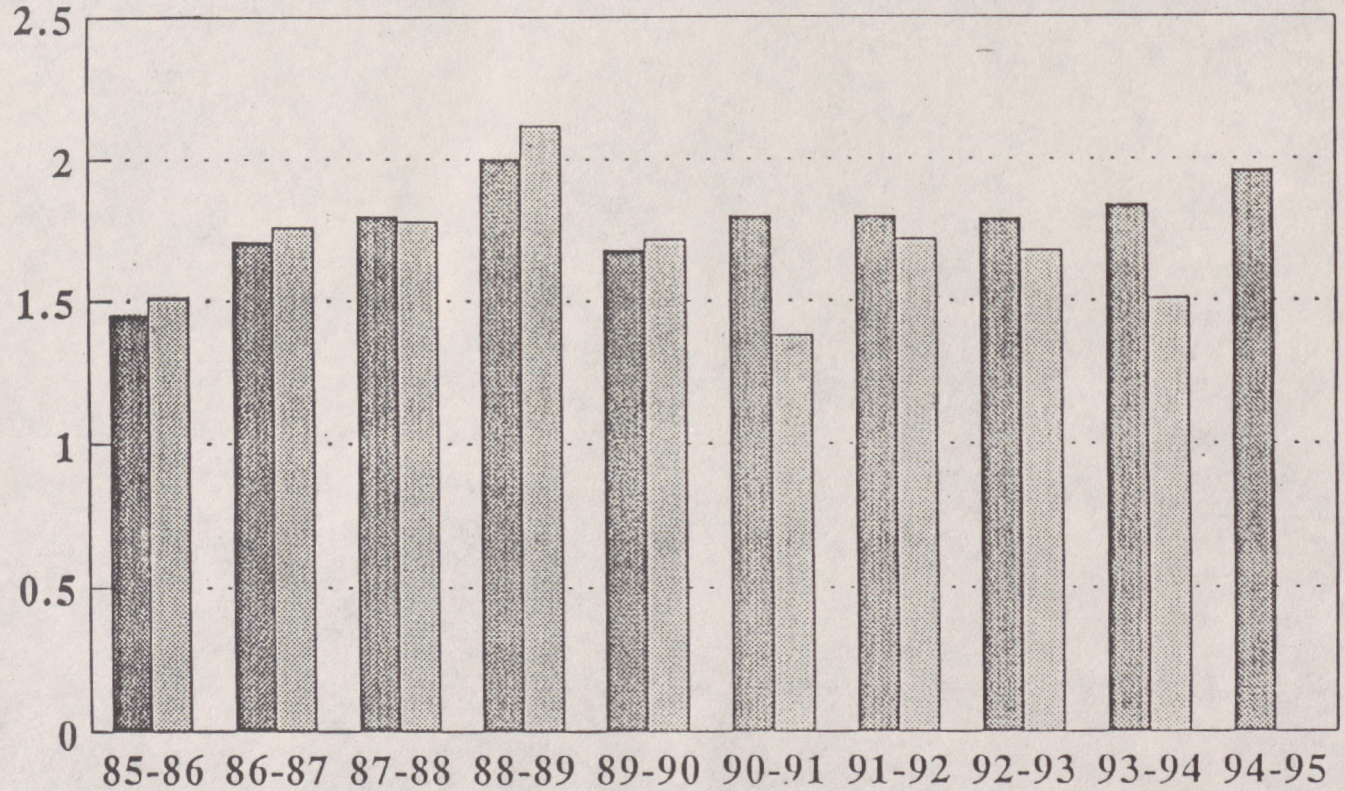
ALL-INDIA OUTLAYS UNDER FORESTRY SECTOR COMPARED TO TOTAL PUBLIC SECTOR OUTLAYS 1951-1990

(Rs. in Crore)

PLAN PERIOD	TOTAL PUBLIC SECTOR	FORESTRY SECTOR	FORESTRY PERCENT OF TOTAL	ACTUAL EXPENDITURE
1ST (1951-56)	1950	7.64	0.39	8.50
2ND (1956-61)	4600	21.21	0.46	21.21
3RD (1961-66)	8576	45.85	0.53	45.94
POST 3RD (1966-69)	6625	41.93	0.63	42.06
4TH (1969-74)	15778	89.42	0.54	93.81
5TH (1974-79)	40650	208.84	0.51	208.84
ANNUAL (1979-80)	12550	68.33	0.54	68.33
6TH (1980-85)	97500	692.49	0.71	NA
7TH (1985-90)	180000	1859.10	1.03	NA

Achievements Under 20 Point Programme

(Area in M.Ha.)

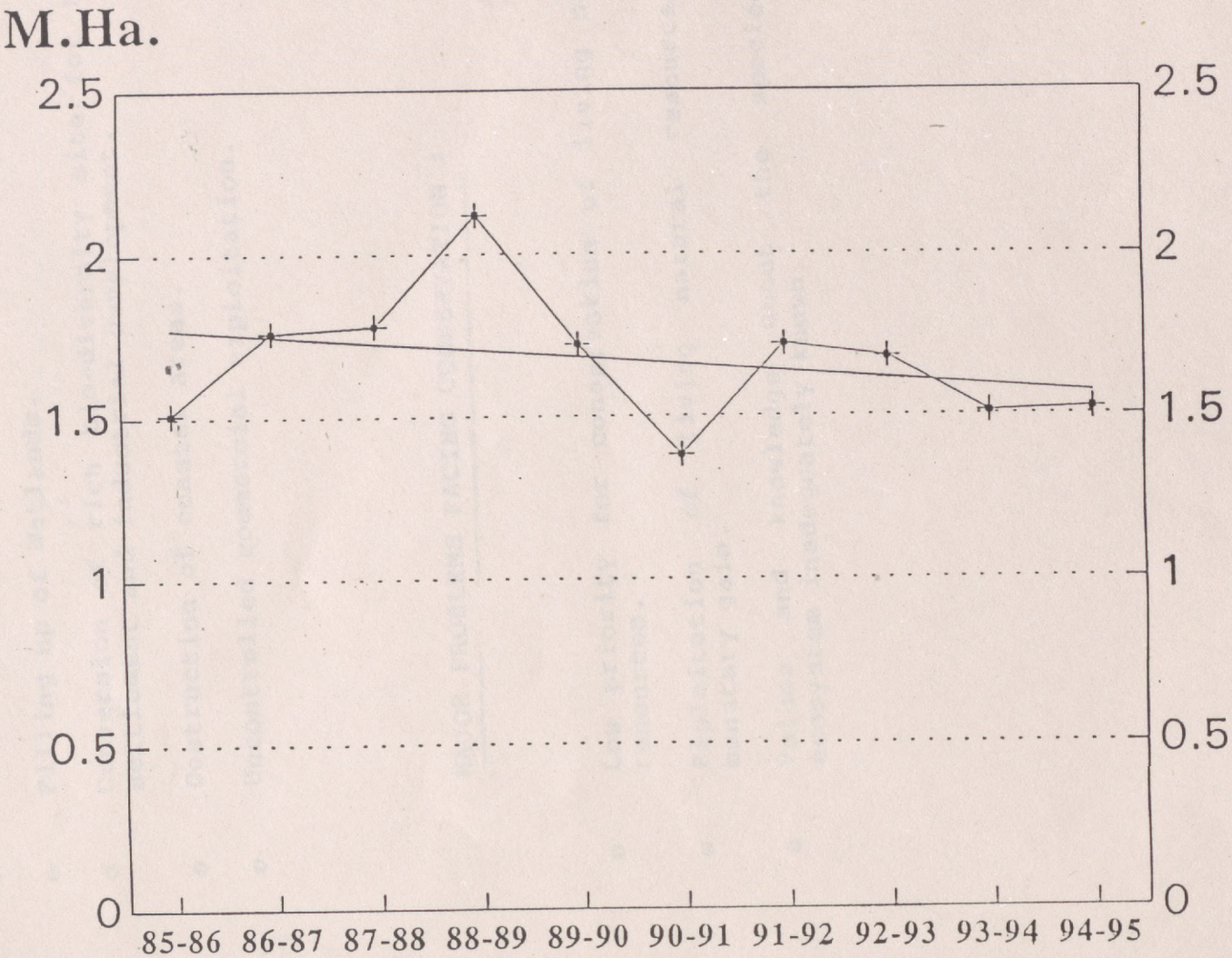


	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95
Target	1.45	1.71	1.8	2.001	1.68	1.8	1.8	1.79	1.84	1.96
Achievements	1.51	1.76	1.78	2.12	1.72	1.38	1.72	1.68	1.51	

Target Achievements

Achievements Under 20 Point Programme

(Actual and Trend)



Achievement	1.51	1.76	1.78	2.12	1.72	1.38	1.72	1.68	1.51	1.52

Figure - I

IDENTIFIED THREATS TO BIO-DIVERSITY :

- Habitat destruction.
- Extension of agriculture.
- Filling up of Wetlands.
- Conversion of rich bio-diversity site for human settlement and industrial development.
- Destruction of coastal areas.
- Uncontrolled commercial exploitation.

MAJOR PROBLEMS FACING CONSERVATION :

- Low priority for conservation of living natural resources.
- Exploitation of living natural resources for monetary gain.
- Values and knowledge about the species and ecosystem inadequately known.

KEY ELEMENT OF BIO-DIVERSITY CONSERVATION :

- Improving Policy Environment.
- Mobilisation of financial resources.
- Integrating conservation with development.

AREAS NEEDING ATTENTION :

- Legal Framework.
- Institutional structure.
- Sectoral financial outlay.
- Human resource development.
- Role of NGOs and other institutions.
- Political commitment and goodwill.

BIO-DIVERSITY CONCEPT REFLECTED TO ACTION :

- Publicity and awareness campaign.
- Regular national and regional reviews.
- Incentives and dis-incentives.
- Cess for utilisation of living resources.
- International Conventions like CITES, CMS, WETLAND, WORLD HERITAGE, etc.
- Conservation rather than preservation.
- Placing bio-diversity in the nucleus of development process.

BROAD APPROACH

1) Creating forest Bio-mass resources outside protected areas.

2) Efficient utilisation of the existing Bio-mass resources.

3) Developing alternatives to current Bio-mass uses.

4) Development of existing skills, practice and programmes of indigenous people which are eco-friendly.

5) Some social and welfare measures in distant and interior areas where other departments programme normally do not reach.

ECO DEVELOPMENT PROJECT

SOCIAL AUDIT PANEL

Ministry of Environment & Forests

Dr. N. Bhaskara Rao
Member - Convenor

D.O.No.SAP/1/95

December 1, 1995

Dear Dr. Swaminathan,

Warm greetings. I am glad to inform that a simple office is being set up now for Social Audit Panel in the Ministry of Environment, Paryavaran Bhawan (Room No.106, 1st Floor, Phone:436-2016). I propose to spend a couple of hours every day hoping that some secretarial help too would be available. You are welcome to use the facility as and when you are around.

Kindly find the minutes of our first meeting held on November 23, 1995. Hoping that Dr. M.S. Swaminathan would be able to make it, the next meeting of the Panel is scheduled between 12 and 14 December, 1995. I would confirm the exact date of meeting on phone after ascertaining from Dr. M.S. Swaminathan.

In the meanwhile, you may like to ask for any information from the Ministry or send any information for circulation among members. Mr. R.S. Ahlawat, Director (PC) in the Ministry has been assigned to coordinate with SAP. You may also like to write to him (436-2065).

With kind regards,

Yours sincerely,

N Bhaskara Rao

(N. BHASKARA RAO)

Dr. M.S. Swaminathan
Chairman
M.S. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras-600 113.

10.30 am
December 11

Minutes of the Social Audit Panel meeting held in Minister's office, Paryavaran Bhavan, New Delhi, on 23.11.1995 at 10 AM:

The first meeting of the Social Audit Panel was addressed by the hon'ble Minister for Environment & Forests. The meeting was attended by the Secretary and other senior officers of the Ministry.

The hon'ble Minister in his introductory remarks explained the objectives of the Social Audit Panel and how it had contributed when he initiated the concept first time in the Govt. in the Ministry of Communication. He shared his anxiety to see that the common man's viewpoint receives due attention in the Ministry's pre-occupation. He also suggested that the Panel should undertake critical review of the policies and activities of the Ministry in the larger and long range context of national interests and make suitable recommendations on policy directions as well implementation - as an independent, objective and knowledgeable body and that panel should decide its own priorities and programme.

Justice Pathak, Chairman of the Panel highlighted the need for education and awareness activities and the need to take into account cultural attitudes and values in that process.

Dr. Bhaskar Rao, Member-Convener of the Panel suggested certain critical issues before the Ministry and the tasks that the Panel could consider in due course(copies enclosed).

Dr. M.S. Swaminathan, Member of the Panel could not attend the meeting as he was away in Geneva. In his letter, Dr. Swaminathan suggested that the Panel take up the issues to do with the forestry act.

Dr. Abid Hussain, Member of the Panel pointed out that activities of the Panel should be such that there would be specific outcome within a time frame. He felt that successes in the current environmental activities should be carried to a logical conclusion with additional inputs needed where needed for replicating the successes across the country. He also reiterated the need for greater awareness and people involvement and educational activities.

Shri Rajamani, Member of the Panel referred to the life- style phenomenon in the country as it has become counter productive affecting the environmental endeavours. He also brought out the contradictions in the basic assumptions and current pre-occupation and policies and cited the example of Rajaji Park (in Dehradun).

Thereafter, hon'ble Minister asked each of the senior officers of the Ministry present to outline their

thinking as to the Social Audit Panel's pre-occupation.

The Secretary of the Ministry Shri Krishnan while detailing the current concerns of the Ministry stated that the SAP is not expected to obtain " public endorsement" to policies but looked forward to contribute on broader issues. He also referred to the National Forest Action Programme for reviewing by the Panel. He hoped that the Ministry would get counselling on policy issues as well from SAP from time to time.

Shri S.C. Dey, Additional IGF cited that SAP should look into the basic five elements of core concern to Environment & Forestry Ministry.

Shri S.K. Pandey, Addl.IGF referred to the Forest (Conseration) Act and hoped that it requires human face in view of the apprehensions about the very act. He also pointed out the meagre allocations (1%) made for the Ministry and also the fact that there has been certain deemphasis offlate to forestry programmes in the poverty alleviation programmes of the Government.

Shri M.F. Ahmed, Inspector General of Forestss cautioned that forestry issues should not be viewed in isolation and the need for larger outlook and about Centre-State relations in implementing the programmes.

Shri S.S. Boparai, Additional Secretary referred to the forestry programmes in backward region and said that some of the policies are out of tune with the aspirations of such regions and brought out the need for macro level view on the forestry policies.

The hon'ble Minister shared his anxiety about expediting the programmes of the Ministry in such a way that they do not come in the way of the poorer section of the population and their development process at the village level. He also felt that with the Panchayat raj Act, the Ministry should decentralise responsibilities to the Panchayats treating them more as NGOs. He also called for streamlining of NGOs' involvement more meaningfully and with better and quicker results at the grassroot level.

The hon'ble Minister thanked the Chairman and Members of the Panel for accepting the responsibility in the larger interests of the country.

Thereafter, the Panel adjourned to meet under the Chairmanship of Justic Pathak. This meeting was also attended by Secretary, Shri N.R. Krishnan,and Joint Secretary, Shri S. Jha.

The Panel in this meeting decided to concentrate to start with on the forestry issues and education, awareness

and people involvement related activities of the Ministry and requested the Secretary for presentations on these two issues at the next meeting of the Panel.

The Chairman suggested that the Panel should meet atleast once every month and the next meeting was suggested for two days between 12 & 14 December, 1995 depending upon the convenience of Dr. M.S. Swaminathan. Shri Rajamani shared his view about the performance in various States and suggested that Panel should visit the States falling in each of three categories on the basis of performance starting with Gujarat in December. The Panel also felt that people like Mr. Anil Agarwal, Mr. Kartika Sarabhai, Ms. Kamla Chaudhary and Mr. Amrinder Singh, WWF should also be invited for meeting the Panel at the next meeting in December.

The Panel also felt that in during field visit, NGOs working in the environment & forestry areas and other experts in that region should be invited for the meeting with the Panel.

Shri Abid Hussain also suggested that Panel should meet people like Shri Shankaran, Shri Yugendher and such others to hear their views including with regard to inter-ministerial linkages.

Dr. Bhaskar Rao agreed to be available in the Ministry for some time every day for coordinating the SAP activities. Shri Krishnan informed that an office will be made available on the first floor of Paryavaran Bhavan for SAP.

CRITICAL AREAS :

I. Atmospheric pollution - prevention, control
   - Transport - mass transit
   - Industry - energy efficiency
   - Use of energy - efficient technologies
   - Protection of monuments (Taj)

II. An integrated approach to Land - use practices - protection, promotion
   - Reducing loss of forests
   - expand area under forest

III. Conservation and Rational use of forests
   - Value of trees, forests ; forest produce ;
   - Promote non-wood forest products

IV. Halting spread of deserts
   - combating desertification

V. Protecting mountain eco systems
   - Soil erosion
   - land slides
   - dams/reservoirs/Lakes

VI. Sustaining Biological diversity
   - viability of genes, species, eco system

VII. Environmentally sound management of Bio technology
   - Rehabilitate degraded ecosystems/landscapes,
   - technology transfer - clear technologies

VIII. Safeguarding costal/oceans Resources
   - Threats from sedimentation, Pollution

IX. Protecting/Managing fresh water/ground water resources
   - Water related diseases/water treatment facilities
   - River basin drainage "Polluter Pays" concept
   - Action plans for rivers - ground water quality

X. Safe use of Toxic chemicals
   - Chemicals long term effects
   - Risk assessment

XI. Managing Hazardous Wastes and radio active wastes
   - Production & disposal
   - quality of concerns - local

XII. Seeking solutions to solid waste problems
   - Sewage disposal
   - quality of life

XIII. People, organisations, linkages,
   - -- Involving people, decentralising responsibility,
   - -- Providing enabling provisions,
   - -- involving local bodies

XIV. Rural energy - Cooking.
   - substitution,

TASKS :

I. a) Encourage Ensure People involvement, citizen action and their networking ;

b) Encourage Voluntary efforts, bring out long term concerns and immediate actions ;

c) Enhance NGOs credibility, commitment and capabilities ; Independent appraisal of NGOs standing ;

d) Create awareness, information, motivation, Sensitising campaigns - avail mass media and field organisations ;

II. Strengthen Inter-ministerial coordination/linkages with specific out-come responsibilities ;

III. Region specific approach, strategies and action programmes for prevention, protection, promotional, conservation, enforcement, enactment ;

IV. a) Research, Monitoring, assessment - lack of data, insights into impact and implications, focused appraisal and evaluation studies at micro and macro levels ;

b) Feed-forward - research/monitoring is used for formulation and modification of interventions/programmes ;

V. Environment audit and impact assessment - relevance of methodologies, transparency ;

VI. Externally-funded projects/programmes - their relevance, outcome and linkage/integration ; maintenance ;

Social Audit Panel Meeting

11.12.1995 - Paryavaran Bhavan

Agenda

10.30 - 12.00 Panel Meet - Discussions with in — Room No.B-3

a) Outcome options, priorities, approach...

b) Meetings - next one : when and where

c) Field visits - Gujarat : whenm, who

d) Schedule during field visits

e) Reports, backgrounders - Rio Agenda 21, etc.

f) Logestics

g) Others

12.00 - 1.30 Presentation on Forestry issues by Mr.N.K.Joshi, DG, ICFRE Mr. S.K. Mukherji, Director, WII — Room No.403

Mr S.C. Dey
Dr N.K Joshi
Mr S.K Mukherji

1.30 - 2.30 Working Lunch

2.30 - 4.00 Presentation on education and awareness activities by Shri Alok Jain — Room No.403

4.00 - 5.00 Meeting with N.G.Os — Room No.403

SOCIAL AUDIT PANEL

Ministry of Environment & Forests

Dr. N. Bhaskara Rao
Member - Convenor

December 7, 1995.

The next meeting of Social Audit Panel is fixed for Monday 11th December 1995. This has been preponed as Dr. M.S. Swaminathan has to be away in Coimbatore on 12th December.

The Panel will meet on Monday at 10.30 AM at 106 Paryavaran Bhavan. Two presentations will be made by senior officials of the Ministry as decided in our first meeting - first one on forestry issues between 12 - 1.30 PM and the second one on Education and Awareness activities between 2.30-4.00 PM. We have also invited a few Delhi based NGOs for the second presentation.

We should also decide our schedule for field visits

With kind regards

N Bhaskar

(N. Bhaskara Rao)

Dr. M.S. Swaminathan
Chairman
MS. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras-600 113.

FAX: 91-44-2351319

Room No. 106, Paryavaran Bhawan, CGO Complex, New Delhi - 110 003 *Telephone: 436 2710*

तार
Telegram : PARYAVARAN,
NEW DELHI
दूरभाष :
Telephone : 4361613
टेलेक्स (द्विभाषीय) :
Telex : (bi-lingual) : W-66185 DOE IN
FAX : 4360678
भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी० जी० ओ० कॉमप्लेक्स
PARYAVARAN BHAWAN, C.G.O. COMPLEX
लोदी रोड, नई दिल्ली - 110003
LODHI ROAD, NEW DELHI - 110003

No.23011/74/95-GC Dated the 15th November'95

To

Dr. M.S.Swaminathan,
Chairman,
M.S.Swaminathan Research Foundation,
3rd Cross Street,
Taramani Institutional Area,
Madras - 600 113.

Sub : Social Audit Panel for the Ministry of Environment and Forests.

Sir,

In continuation of the D.O. letter of even number dated the 13th November, 1995 from Secretary (Environment & Forests) on the subject mentioned above, I am desired to enclose herewith a copy of this Ministry's Annual Report for 1994-95 for your kind perusal.

Pl. keep this in the Social Audit Panel file

Yours faithfully,

D Bhattacharya 17/11

(Sarweshwar Jha)
Joint Secretary to the Govt.of India

Mr Raman

Encl : as above

MSS/RM/ 7262
17 November 1995

Shri N.R. Krishnan
Secretary
Ministry of Environment & Forests
C.G.O. Complex, Lodi Road
New Delhi - 110 003.

My dear Shri. Krishnan,

As per the conversation, I have written to the Minister of Environment and Forests about the priority activity of the Social Audit Panel. I enclose a copy of the letter.

With warm personal regards,

Yours sincerely,

M.S. Swaminathan

Encl: as above

DESPATCHED
DATE 18/11/95.

M. S. SWAMINATHAN RESEARCH FOUNDATION

M. S. SWAMINATHAN
Chairman

MSS/RM/ 7267
17 November 1995

Shri Rajesh Pilot
Minister - Environment & Forests
Govt. of India
C.G.O. Complex, Lodi Road
New Delhi - 110 003.

My dear Shri Pilot,

I am most grateful to you for your kind letter inviting me to serve on the Social Audit Panel you are constituting.

I am sorry, I am unable to attend the meeting you have convened on 23rd November since I have to be away in Rome on that day to chair a meeting of the Policy Oversight Committee of the FAO.

I would like to suggest for your consideration that the first item which could be taken up for detailed examination by the Panel may be "*Forest Conservation, Sustainable Management and the Forest Conservation Act*". In my view, the highest priority will have to be given to protecting the remaining good forests and the associated National Parks, we still have. At the same time, we have to rehabilitate and afforest the degraded forests. Atleast 20% of our country should be brought under forests with adequate crown density.

If you feel appropriate, the Panel can go into all aspects of forest conservation, management and rehabilitation in a holistic manner including the legal and community participation aspects.

With warm personal regards,

Yours sincerely,

M.S. Swaminathan

M.S. Swaminathan

DESPATCHED
DATE 18/11/95

3rd Cross Street, Taramani Institutional Area, Madras-600113
Telephone: (044) 2351229, 2351698, Fax: +91-44-2351319

MSS/RM/ 7267
17 November 1995

Shri Rajesh Pilot
Minister - Environment & Forests
Govt. of India
C.G.O. Complex, Lodi Road
New Delhi - 110 003.

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If you feel appropriate, the Panel can go into all aspects of forest conservation, management and rehabilitation in a holistic manner including the legal and community participation aspects.

With warm personal regards,

Yours sincerely,

Copy to Shri N.R. Krishnan

M.S. Swaminathan

DESPATCHED
DATE 18/11/95

पर्यावरण एवं वन मंत्री/डा० सं० .....
MEF/Diary No. 19-21 95

सत्यमेव जयते

मंत्री

पर्यावरण एवं वन

भारत

MINISTER
ENVIRONMENT & FORESTS
INDIA

27 OCT 1995

Dear Dr Swaminathan ji

You are aware that the Ministry of Environment & Forests is the nodal agency in the administrative structure of the Central Government for the planning, promotion and coordination of environmental and forestry programmes. To attain these objectives, the various activities being carried out by the Ministry are environmental impact assessment; eco-regeneration; promotion of environmental and forestry research; dissemination of environmental information; international cooperation and assistance to organisations implementing environmental and forestry programmes. We believe that the best way to conserve nature and environment is to involve the local community on voluntary and self-sustaining basis and dovetail the programmes of Ministry accordingly to make them truly peoples' programmes.

Considering the unique importance of the activities of the Ministry to the public at large, we have decided to introduce the concept of Social Audit Panel (SAP) in the Ministry to facilitate taking into account the inputs of people duly processed through the hands of those eminent citizens who have attained pinnacle of their respective careers, into our decision making to make the process transparent. The Panel would deliberate, consult and undertake critical review of implementation of the programmes of the Ministry and make suggestions on the policy directions as well as on their implementation. The Panel would be an Advisory Body and would set its own formalities, priorities, mode and methodology of going about its work and would help monitor whether the initiatives taken by the Ministry are being implemented in their spirit, and benefitting the public at large in the best interest of the country.

We consider that your august participation in this Panel would be of immense value in achieving these objectives. It will be a matter of privilege for us to have the benefit of your advice and recommendations as a member of the Social Audit Panel.

contd. 2/-

I am thankful to you for having consented to be a member of the Panel. I am separately asking Shri N.R. Krishnan, Secretary (Environment & Forests) to arrange for the first meeting of the Panel at the earliest at the mutual convenience of us all.

With regards,

Yours sincerely,

(RAJESH PILOT)

Dr. M.S. Swaminathan,
Chairman,
M.S. Swaminathan Research Foundation
3rd Cross Street,
Taramani Institutional Area,
MADRAS - 600 113.

MSS/VS/
15 November 1995

Shri N.R. Krishnan
Secretary, Government of India
Ministry of Environment and Forests
CGO Complex, Lodi Road
New Delhi 110 003

My dear Shri Krishnan,

I thank you very much for your kind letter of 13 November. Unfortunately, I have to be away in Rome on 23 November to chair a meeting of the Policy Oversight Committee of FAO. I am therefore very sorry I will miss the meeting convened by the Minister. Please convey my sincere apologies to him. I shall fix up a separate appointment with him.

With warm personal regards,

Yours sincerely,

M.S. Swaminathan

Pl. keep in separate file

सत्यमेव जयते

N.R. KRISHNAN

D.O. No.

सचिव (पर्यावरण एवं वन)
भारत सरकार
Secretary (Environment & Forests)
Government of India

Dated .....

DO No.23011/74/95-GC.

13th November, 1995

Dear Dr. Swaminathan,

I am enclosing a copy of the Government Resolution setting up the Social Audit Panel. Minister for Environment and Forests, Shri Rajesh Pilot, would like to meet with Chairman and Members of the Panel at 10.00 am on thursday the 23rd November, 1995 in his office in Paryavaran Bhavan (4th floor), CGO Complex, Lodi Road, New Delhi. Do kindly make it convenient to attend.

With respects

Yours sincerely,

NKrishnan

(N.R.KRISHNAN)

Dr. M.S.Swaminathan,
Chairman,
M.S.Swaminathan Research Foundation,
3rd Cross Street,
Taramani Institutional Area,
MADRAS 600 113.

पर्यावरण एवं वन मंत्रालय, सी०जी०ओ० कॉम्पलेक्स, लोदी रोड, नई दिल्ली-110003 फोन : 4360721
Ministry of Environment & Forests, C.G.O. Complex, Lodi Road, New Delhi-110003 (Tel. : 4360721 Fax No. 4360678)

TO BE PUBLISHED IN PART-I SECTION-I OF GAZETTE OF INDIA

GOVERNMENT OF INDIA (BHARAT SARKAR)
MINISTRY OF ENVIRONMENT AND FORESTS
(PARYAVARAN AUR VAN MANTRALAYA)

....

Paryavaran Bhawan,
CGO Complex, Lodi Road,
New Delhi - 110 003.

Dated the 13th November, 1995
22 Kartika, 1917(S)

RESOLUTION

Subject:- Constitution of a Social Audit Panel for the Ministry of Environment and Forests.

No. 23011/74/95-GC. The Ministry of Environment and Forests is the nodal agency in the Government of India charged with the planning, promotion and coordination of all activities relating to environmental conservation. From according clearance to development projects from the environmental angle to creating awareness among the public on environmental matters, the work of the Ministry covers a wide spectrum of people oriented activities including protection and augmentation of forest wealth and wildlife, eco-development, mitigation of industrial disasters, pollution control, ensuring ecological health of water resources and capacity building.

2. While the above activities have been initiated because of their ecological relevance, their implementation and success depends on participation by the people particularly the local communities, non-governmental organisations and the media. A need has thus been felt to assess general public awareness and appreciation of the Ministry's programmes and projects and to take corrective action, wherever needed, to model them to suit peoples' requirements and to mobilise peoples' support and participation.

3. With the above objective, the Ministry of Environment and Forests has set up a Social Audit Panel to undertake reviews of the activities of the Ministry and make suitable recommendations.

4. The composition of the Panel will be as follows:

Shri Justice R.S.Pathak, - Chairman
Former Chief Justice of India,
New Delhi.

Dr. M.S.Swaminathan, - Member
Chairman,
M.S.Swaminathan Research Foundation,
Madras.

Shri Abid Hussain, - Member
Vice-Chairman,
Rajiv Gandhi Foundation,
New Delhi.

Shri R.Rajamani, - Member
Former Secretary to Govt. of India,
Ministry of Environment & Forests,
Hyderabad.

Dr. N.Bhaskar Rao, - Member-Convenor
New Delhi.

5. The Panel will function as an advisory body.

6. The term of the Panel will be two years.

(Sarweshwar Jha)
Joint Secretary to the Govt. of India

ORDER

Ordered that the Resolution be communicated to all the State Governments, Prime Minister's Office, Cabinet Secretariat and all the Ministries of the Government of India.

Ordered also that the Resolution be published in the Gazette of India for general information.

(Sarweshwar Jha)
Joint Secretary to the Govt. of India

Manager,
Govt. of India Press,
Faridabad.

Copy to:-

1. All Office Bearers of the Panel.
2. PS to MEF
3. Secretary (Environment & Forests)
4. IGF & Spl.Secretary
5. Addl.Secy.(B)/Addl.Secy.(SSB)/Addl.Secy.(VA)
6. Addl.IGF(D)/Addl.IGF(P)
7. JS(AJ)/JS(AK)/JS(FA)/JS(JCK)/JS(NA)/JS(SJ)/JS(VS)
8. Adviser(B)/Adviser(H)/Adviser((M)
9. Director(PC) - He will function as link officer for Ministry of Environment & Forests.

(Sarweshwar Jha)
Joint Secretary to the Govt. of India

MSS/RM/ 6753
November 3, 1995

Shri Rajesh Pilot
Honourable Minister for Environment &
Forests
Paryavaran Bhavan, CGO Complex
Lodi Road, New Delhi 110 003.

Dear

I am most grateful to you for your letter of 27th October inviting me to serve as a Member of the "Social Audit Panel(SAP)" of your Ministry.

I shall be very happy to serve on this Panel.

With warm personal regards

Yours sincerely,

M.S. Swaminathan

Pl. keep this in a separate file titled "Social Audit Panel", Ministry of Environment & Forests

3/11

Mr Raman

DESPATCHED
DATE 6/11/95

पर्यावरण एवं वन मंत्री/डा० सं०.....
MEF/Diary No ....19-21....

Kind Attention:

Dr. M.S. Swaminathan

मंत्री
पर्यावरण एवं वन
भारत
MINISTER
ENVIRONMENT & FORESTS
INDIA

27/10/95

Dear Dr Swaminathan ji

You are aware that the Ministry of Environment & Forests is the nodal agency in the administrative structure of the Central Government for the planning, promotion and coordination of environmental and forestry programmes. To attain these objectives, the various activities being carried out by the Ministry are environmental impact assessment; eco-regeneration; promotion of environmental and forestry research; dissemination of environmental information; international cooperation and assistance to organisations implementing environmental and forestry programmes. We believe that the best way to conserve nature and environment is to involve the local community on voluntary and self-sustaining basis and dovetail the programmes of Ministry accordingly to make them truly peoples' programmes.

Considering the unique importance of the activities of the Ministry to the public at large, we have decided to introduce the concept of Social Audit Panel (SAP) in the Ministry to facilitate taking into account the inputs of people duly processed through the hands of those eminent citizens who have attained pinnacle of their respective careers, into our decision making to make the process transparent. The Panel would deliberate, consult and undertake critical review of implementation of the programmes of the Ministry and make suggestions on the policy directions as well as on their implementation. The Panel would be an Advisory Body and would set its own formalities, priorities, mode and methodology of going about its work and would help monitor whether the initiatives taken by the Ministry are being implemented in their spirit, and benefitting the public at large in the best interest of the country.

We consider that your august participation in this Panel would be of immense value in achieving these objectives. It will be a matter of privilege for us to have the benefit of your advice and recommendations as a member of the Social Audit Panel.

contd. 2/-

I am thankful to you for having consented to be a member of the Panel. I am separately asking Shri N.R. Krishnan, Secretary (Environment & Forests) to arrange for the first meeting of the Panel at the earliest at the mutual convenience of us all.

With regards,

Yours sincerely,

(RAJESH PILOT)

Dr. M.S. Swaminathan,
Chairman,
M.S. Swaminathan Research Foundation
3rd Cross Street,
Taramani Institutional Area,
MADRAS - 600 113.

पर्यावरण एवं वन मंत्री/डा० सं०.....
MEF/Diary No ....19-21....

Kind Attention:

Dr. M.S. Swaminathan

मंत्री
पर्यावरण एवं वन
भारत
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ENVIRONMENT & FORESTS
INDIA

27-10-95

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Yours sincerely,

(RAJESH PILOT)

Dr. M.S. Swaminathan,
Chairman,
M.S. Swaminathan Research Foundation
3rd Cross Street,
Taramani Institutional Area,
MADRAS - 600 113.

सत्यमेव जयते

ANNUAL REPORT 1994-95

MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA

सत्यमेव जयते

ANNUAL REPORT 1994-95





MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA

Fig. 1 Amaltas *(Cassia fistula)*, a common avenue tree

CONTENTS

Fig. 2 Zjezbel Butterfly-an important link in pollination cycle

1

INTRODUCTION AND THE YEAR UNDER REVIEW

Role and Organisation

The Ministry of Environment and Forests is the nodal agency in the administrative structure of the Central Government, for the planning, promotion and coordination of environmental and forestry programmes. The main activities of the Ministry are: conservation and survey of flora, fauna, forests and wildlife; prevention and control of pollution afforestation and regeneration of degraded areas and protection of environment. These tasks are being fulfilled through environmental impact assessment, eco-regeneration, assistance to organisations implementing environmental and forestry programmes; promotion of environmental and forestry research, extension, education and training to augment the requisite manpower, dissemination of environmental information, international cooperation and creation of environmental awareness among all sectors of the country's population.

The organisational structure of the Ministry indicating various divisions, associated and autonomous offices/ agencies is given in Annexure I.

Allocation of Business

- Environment and Ecology, including environment in coastal waters, in magroves and coral reefs but excluding marine environment on the high seas.
- Botanical Survey of India and Botanical Gardens.
- Zoological Survey of India.
- National Museum of Natural History.
- The Water (Prevention and Control of Pollution) Act, 1974.
- The Water (Prevention and Control of Pollution) Cess Act, 1977.
- The Air (Prevention and Control of Pollution) Act, 1981.
- The Indian Forest Act, 1927.
- The Prevention of Cruelty to Animals Act, 1960.
- The Wildlife (Protection) Act, 1972.
- The Forest (Conservation) Act, 1980.
- The Environment (Protection) Act, 1986.
- The Public Liability Insurance Act, 1991.
- Biosphere Reserve Programme.

-- National Forest Policy and Forestry Development in the country, including Social Forestry.

-- Forest Policy and all matters relating to forests and forest administration in so far as the Andaman and Nicobar Islands are concerned.

-- Indian Forest Service.

-- Wildlife preservation and protection of wild birds and animals.

-- Prevention of Cruelty to Animals.

-- Central Zoo Authority.

-- Fundamental research, including coordination thereof and higher education in forestry.

-- Padmaja Naidu Himalayan Zoological Park.

-- National Assistance to Forestry Development Schemes.

-- Central Ganga Authority.

-- Indian Plywood Industries Research Training Institute, Bangalore.

-- National Afforestation and Eco-Development Board.

-- Desert and Desertification.

An overview of the activities of the Ministry and its associated offices/organisations during the year.

Survey of Natural Resources

Flora

-- More than 30 exploration tours were undertaken by the various circles and units of the B.S.I. in the States of Assam, Manipur, Mizoram, Meghalaya, Karnataka, Maharashtra, Orissa, Sikkim, N.W. Himalayas of U.P., Himachal Pradesh, Andaman & Nicobar Islands during which nearly 4700 specimens have been collected.

-- An ENVIS Centre on plant ecology has been established at the BSI.

-- Two books "Manual of Cultivated Palms in India" and "Bicentenary of Indian Botanic Gardens-a Pictorial Glimpse" brought out by the BSI were released by the Hon'ble Minister for Environment and Forests.

Fauna

-- A total of 65 surveys covering 89 districts falling under different ecosystems were conducted by the headquarters and other regional stations of the ZSI.

-- The first report on the status of endangered species has been released and the status of three endangered mammals viz., Golden Langur, Phyres Leaf Monkey and Hispid Hare are included in this report.

-- The national zoological collections have been enriched by the addition of 71,460 identified specimens pertaining to 2455 species.

-- A volume on the Fauna of Andhra Pradesh, Part-I, was released by the Hon'ble Chief Minister of Andhra Pradesh.

-- The foundation stone for the office-cum-research laboratory of the Arunachal Pradesh field station of the ZSI has been laid on 19th October, 1994 by the Hon'ble Chief Minister of Arunachal Pradesh.

Forests

-- The Forest Survey of India continued with its activities related to the preparation of thematic and vegetation maps and inventory of forest resources through electronic data processing and digital image processing.

Conservation of Natural Resources including Forestry and Wildlife

Biosphere Reserves

-- The Simplipal Biosphere Reserve has been set up during the year in Orissa; there are thus 8 Biosphere Reserves in the country now.

Wetlands, Mangroves and Coral Reefs

-- Out of 21 wetlands identified for intensive conservation and management purposes, Management Action Plans have been drawn up for 12 wetlands.

-- An Asian Regional Meeting of the Contracting Parties to the Ramsar Convention is being organised at New Delhi during 23-25 March, 1995.

-- Management Action Plans for all the 15 mangrove areas identified for intensive conservation and management purposes have been sanctioned.

-- The Management Action Plan for the coral reefs of Andaman & Nicobar prepared by the Andaman & Nicobar Administration has been sanctioned.

Lake Conservation

-- A National Lake Conservation Plan has been prepared to augment the on-going programme on wetlands by undertaking large scale conservation activities in selected lakes. Urban lakes are proposed to be covered initially.

Bio-diversity Conservation

-- The convention on Biological Diversity, ratified by India on 18th February, 1994, has come into force for India from 19th May, 1994.

-- The draft of volume II of the "Status Report on Bio-diversity Conservation" has also been received and the report is now being finalised.

-- Action has been initiated to regulate the transfer of indigenous genetic material from the country, through a compreshensive act on bio-diversity.

-- An official level meeting among SAARC, ASEAN and other countries of the South Asian region was organised in Bangalore during 22nd-23rd August, 1994 with support from UNEP with the objective of evolving mechanisms for regional cooperation on issues related to biological diversity.

-- India participated in the second meeting of the Inter-Governmental Committee on the Convention of Biological Diversity and in the first meeting of the Conference of Parties to the Convention.

Desertification

-- India has signed the International Convention to combat desertification on 14th October, 1994. An Interministerial Committee has been constituted in the Ministry to prepare a National Action Programme for India to combat desertification and to mitigate the effects of drought.

Central Zoo Authority

-- The Central Zoo Authority has completed evaluation of 11 large, 8 medium, 9 small and 6 mini zoos of the country. It has also published stud books for the Asiatic Lion and the Royal Bengal Tiger.

Forest Conservation

-- Out of 6,253 proposals received till date under the Forest (Conservation) Act, 1980, 3,232 proposals have been approved so far.

-- Fifteen States have issued appropriate Government orders/resolutions enabling people's participation in management of forests on usufruct sharing basis.

- Zonal Sector Review Reports have been prepared under the National Forestry Action programme and suitable organisations/institutions/individuals for consultancy in specific subject areas have been identified.

Wildlife Conservation

-- The network of protected areas in the country now consists of 80 National Parks and 441 Wildlife Sanctuaries covering an area of 1,48,700 sq. kms.

-- The Committee appointed to look into the issues related to illegal trade in wildlife and wildlife products, has recommended several measures for strengthening anti-poaching infrastructure.

-- A Rajiv Gandhi Award and two Fellowships named after Salim Ali and Kailash Sankhla have been instituted by the Ministry for recognising eminent officers and field workers for exemplary work in the field of wildlife conservation and reserch.

-- Under Project Elephant, three regional workshops were organised to finalise the elephant conservation action plan.

-- Two new Tiger Reserves namely, Panna (Madhya Pradesh) and Dampa (Mizoram) have been established, thus taking the total number of Tiger Reserves in the country to 23.

- An interim Secretariat has been set up at New Delhi for the Global Tiger Forum.

- Several grass-root level workshops were organised in different Tiger Reserves for initiating and encouraging people's participation in eco-development activities.

Animal Welfare

- Twenty one States/UTs have so far constituted State Advisory Boards and 29 States have appointed Nodal Officers for Animal Welfare.

- A status report on the use of animals for experimental purposes in the country has been prepared.

- In collaboration with the Royal Society for Prevention of Cruelty to Animals, London, the Animal Welfare Board of India conducted about 125 camps all over

the country to educate and train the members of SPCAs/Animal Welfare Organisations and the general public.

Environmental Impact Assessment

- The EIA Notification issued in January, 1994 has been amended on 4th May, 1994.
- A total of 429 projects were appraised/reappraised during the year, out of which 104 projects were granted environmental/site clearance.
- The CRZ Notification issued in 1991 has been amended.
- Four studies on carrying capacity are being sponsored for Doon Valley, National Capital Region, Damodar River Basin and Tapi Estuary.

Prevention and Control of Pollution

- Sector specific model environmental audit reports in respect of selected representative sectors from the heavily polluting categories have been prepared and sector-wise environmental audit workshops are also being organised for selected sectors throughout the country.
- A software package 'Paryavaran' has been prepared for analysis of information submitted in environmental statement and is being distributed to all the State Pollution Control Boards.
- Under the project "Environmental Statistics and Mapping" using GIS and remote sensing with specific reference to abatement of pollution, base thematic maps on 1:6 M scale have been prepared and digitised.
- The scheme for setting up a "Cleaner Technology Promotion Network" has been approved for World Bank Assistance.
- A manual titled "From Waste to Profits" containing guidelines for waste minimistation has been prepared. Sector-specific manuals for pulp and paper, pesticide formulations and textiles, dyeing and printing are also being prepared.
- Waste Minimisation Circles are proposed to be set up; each Circle would be an assembly of representatives of similar types of industries in a cluster working collectively to promote waste minimisation in their respective units as part of their overall business strategies.
- Unleaded petrol would be sold in selected retail outlets of the four metropolitan cities of Delhi, Bombay, Calcutta and Madras from 1st April, 1995 along with leaded petrol.
- Petrol with a maximum lead content of 0.15 g/l has been introduced at all the retail outlets of the four metro cities since June, 1994.
- Effluent and emission standards for 11 categories of specific industries have been finalised for notification under the Environment (Protection) Act, 1986.
- National Ambient Air Quality standards have also been finalised.
- Vehicular pollution surveys have been conducted in seven cities by the Central Pollution Control Board.
- Noise pollution surveys were carried out in Ahmedabad, Aurangabad and Managlore.
- Under the Ground Water Quality Project, a total of 34 parameters have been monitored at 21 selected sites through a network of 134 sampling locations.
- A 'Water Quality Atlas' prepared by the Survey of India, based on the data provided by the CPCB, was released on 5th June, 1994 by the Hon'ble Minister for Environment and Forests.
- A NGO Cell has been set up at the CPCB; about 120 water testing kits have been distributed to NGOs and schools.
- a Micro-Earth Station has been installed in the CPCB and the CPCB and the SPCBs are now interconnected to each other through various electronic networks.
- Guidelines have been developed for preparing a "Zoning Atlas" for siting industries based on environmental considerations.

Management of Hazardous Substances

- Amendments to the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 have been notified. Safety audit is now mandatory for major accident hazard units.
- Under the on-going industrial pocket-wise hazard analysis studies, 11 more studies have been initiated during the year.
- Several relevant date bases have been obtained for the

National Register for Potentially Toxic Chemicals (NRPTC) and connectivity to other relevant institutions is also being established through electronic networks.

- A Status Report on H-acid, J-acid and seven other dye-intermediates has been prepared and circulated to various organisations for comments.
- It is proposed to set up a "Poison Control Centre" at the All India Institute of Medical Sciences, New Delhi.
- Financial assistance has been provided to three States for the development of secured land fills at four sites for the disposal of hazardous wastes.
- The first phase of the R & D project on "Application of clay soils and indigenously available synthetic membranes for lining landfills for hazardous waste disposal" has been completed by NEERI, Nagpur.
- Central Road Research Institute, Delhi, has submitted an Interim Report for the pilot project on the use of municipal solid waste in road construction.
- A workshop was organised in October, 1994 at Chandigarh to increase awareness about the PLI Act.

Regeneration and Development

Ganga Action Plan (GAP)

- Out of the 261 schemes sanctioned under the GAP, 237 schemes have been completed so far.
- A 80 mld sewage treatment plant with bio-gas power generation facilities has been set up at Dinapur, Varanasi and a 14 mld UASB plant has been set up at Mirzapur under the Indo-dutch Programme.
- Infrastructure capable of intercepting and diverting 628 mld and treating 431 mld of municipal sewage has been created so far under GAP Phase I.
- Under the Yamuna Action Plan, pollution abatement works are proposed to be taken up in 15 towns while three towns would be covered under the Gomti Action Plan. The implementation period of both the Action Plans is about six years.
- Project Feasibility Reports for all the 8 towns in U.P. have been approved under the Yamuna Action Plan.
- Under the Gomti Action Plan, preliminary surveys and sewer cleaning works have been taken up in Lucknow; low cost sanitation schemes and electric crematoria have been sanctioned for Sultanpur and Jaunpur.
- The National River Action Plan (NRAP) is proposed to be renamed as the National River Conservation Plan (NRCP). Action has been initiated to obtain approval of the CCEA (Cabinet Committee of Economic Affairs) to implement the NRCP.

National Afforestation and Eco-Development Board

- All the Centrally Sponsored Schemes relating to promotion of afforestation, wastelands development, fuelwood and fodder production, conservation of minor forest produce, aerial seeding etc., were continued.
- Approval of the Planning Commission has been sought for the Indira Kunj Schemes and the scheme of city forests in urban areas.
- Wastelands maps for 9 more districts of M.P. are being prepared, besides those completed for 84 districts earlier.

Research

Environmental Research

- Under the three major research schemes viz., Man and Biosphere Programme, Environmental Research Scheme and the Action-oriented Research, Demonstration and Extension Programmes on Eastern and Western Ghats, a total of 91 new projects were sanctioned, 18 projects were completed and 200 projects were serviced.
- Under the Coordinated Research Project on Ethnobiology, a document titled "Ethnobiology in India - A Status Report" has been published, which records over 9500 wild plant species used by tribals for various purposes.
- A Status Report on the Impact of Mining on Environment in Goa has been prepared under the coordinated Research Project on Conservation of Endangered Plant Species.
- The United Nations Framework Convention on Climate Change came into force from 21st March, 1994 and India participated in the meetings of the INC (Inter-Governmental Negotiating Committee) as well as the IPCC (Inter-Governmental Panel on Climate Change).
- The G.B. Pant Institute of Himalayan Environment and Development continued with its research, education

and extension activities relating to Himalayan environmental issues. The Institute has signed a MOU with the School of Forestry and Environmental Studies, Yale University, USA for research and information exchange concerning rural resources.

- Four research projects on Wetlands, one on Mangroves and thirteen projects pertaining to Biosphere Reserves have been sanctioned during the year.

Forestry Research

- The ICFRE continued to coordinate, direct and oversee the research activities of the various research institutes and centres under its administrative control in the field of forestry.
- The Council and its institutes have identified 282 plants whose fruits are edible, 199 plants whose leaves are edible, 104 plants with edible stems and shoots, 112 plants with edible seeds, 46 plants whose flowers are edible and 74 plants yielding edible rhizomes, tubers and corns for use of tribals inhabiting forest areas.
- The Indian Plywood Industries Research and Training Institute, Bangalore continued to focus on research and extension activities aimed at reducing the pressure on natural forests.

Research under Ganga Action Plan

- The thrust of the research work was on scheme specific activities which could be gainfully utilised in the implementation of the GAP.
- Under the water quality monitoring programme, river modelling exercises are being taken up for the rivers Krishna, Tunga and Bhadra.
- Experiments have been initiated to disinfect the sewage from bacterial pollution by using new technologies based on UV and Gamma Radiation.
- The turtle rehabilitation programme is being replicated in the Mathura and Agra region under the YAP, in view of its success under GAP.
- Surveys and studies are proposed to be initiated to tackle the problem of pollution in non-perennial rivers and drains of coastal areas.

Wildlife Research

- The Wildlife Institute of India, Dehradun continued to carry out research projects covering a wide range of ecological, biological, management and socio-economic aspects of wildlife conservation.
- A survey project on identifying and suggesting alternate habitats for the Asiatic lion has been completed.
- The Salim ali Centre for Ornithology and Natural History (SACON) continued with its research activities focussing on various issues related to conservation of bio-diversity.

NNRMS

- The Standing Committee on Bio-resources and Environment constituted to advise the Ministry on the methods of using remote sensing technology for optimal use and management of the natural resources of the country, has approved four new projects and reviewed the progress of nine on-going projects.

Education, Training and Information

Forestry Education, Training and Extension

- The Indian Council of Forestry Research and Education (ICFRE), the focal point for forestry research, education and extension development in the country, brought out several publications including thirty brochures on multi-purpose tree species and 10 books and monographs on various aspects of forests.
- The Council also organised various seminars, conferences, consultations and short-term courses on different aspects of forests.
- About 207 candidates from India and abroad have so far been registered for Ph.D. in various disciplines of forestry at the Forest Research Institute (FRI), a deemed university.
- The Indian Plywood Industries Research and Training Institute (IPIRTI), Bangalore organised 8 short-term courses on various aspects of plywood besides the regular one year certificate course in Mechanical Woods Industries Technology.
- The Indian Institute of Forest Management (IIFM), Bhopal conducted four Management Development Programmes and two National Workshops besides the two year P.G. Programme in forestry management and the M. Phil level course in resource management.
- The Indira Gandhi National Forest Academy (IGNFA), Dehradun continued to impart inservice professional training to the IFS probationers.

The three State Forest Service Colleges at Dehradun, Coimbatore, and Burnihat and the Eastern Forest Rangers' College, Kurseong continued with their regular training programmes for SFS Officers and forest rangers.

Wildlife Education and Training

The Wildlife Institute of India, Dehradun organised a large number of short-term courses, seminars and workshops aimed at providing inservice training to IFS Officers and others in wildlife management.

Non-formal Environmental Education & Awareness

National Environment Awareness Campaign (NEAC)

- The main themes for NEAC-94 were Joing Forest Management, Eco-development and Montreal protocol. about 2200 organisations comprising of NGOs, schools, colleges, universities, research institutions, women and youth organisation, etc., were supported to organise a variety of activities aimed at creating awareness about environmental issues among different target groups of the country's population. Eighteen Regional Resource Agencies assisted the Ministry in planning, implementing, monitoring and evaluating the activities of the campaign all over the country.
- About 2000 eco-clubs have been set up in schools located in different parts of the country.
- One hundred eighty three districts spread over 25 States and 4 Union Territories have been identified for constitution of "Paryavaran Vahnis" which seek to create environmental awareness through public participation.
- Three films related to afforestation and eco-development have been produced by the National Afforestation and Eco-development Board. A total of 18 films on various environmental issues was sponsored by the Ministry during the year.

Centres of Excellence

- The Centre for Environment Education, Ahmedabad and the CPR Environment Education Centre, Madras continued to organise activities aimed at creating environmental awareness among all sections of the society, especially the students and the teachers.
- To mark 10 years of CEE's existence, a seminar was organised to assess the strength and limitations of the Centre and to set courses of action for the future.
- Three short courses on Bio-diversity, Forest Management and Environment Education were organised under the TALEEM Programme.
- New nodes of the EE Bank have been establised at Guwahati and Pune.
- A two-month 'Internship on Environment Education' and a focus-group seminar on Solid Waste Management were organised at Ahmedabad and Bangalore respectively under the SASEANEE.
- Four books for children on environmental topics have been produced for the SACEP, Colombo.
- Six short video spots on environment have been produced.
- Seminars on "Environmental Protection, People and the Law" have been organised in several cities of the country by the CPR Environment Education Centre, Madras.
- Nine sites in villages of Tamil Nadu have been taken up for restoration of sacred groves.
- Soil samples from 153 sites and water samples from 23 sites of Tamil Nadu and Andhra Pradesh were collected and anlysed.
- A Regional Conference on Women and Eco-development was organised in January, 1995 in which NGOs from South and South-East Asian countries also participated.
- The Centre of Mining Environment, Dhanbad organised the 2nd National Seminar on Minerals and Ecology.
- Six executive development programmes were organised for mineral industry personnel besides the regular M. Tech Programme.
- The 3-semester M. Tech Programme on Environmental Sciences and Engineering being offered by the Centre, is now recognised by the All India Council of Technical Education (AICTE).
- The Centre for Ecological Sciences, Bangalore continued to focus on research related to the ecology and environment of the Western Ghats.
- Land has been acquired in Tamil Nadu for the construction of a permanent building for the Salim Ali Centre for Ornithology and Natural History.

National Museum of Natural History (NMNH)

- The NMNH was awarded a 'gold medal' by the ITPO for an exhibition on "Sustainable Development" organised by it during the India International Trade Fair from 14th-27th November, 1994 at Pragati Maidan.
- The Foundation Stone for the Regional Museum of Natural History, Bhubaneswar was laid by the Hon'ble Minister for Environment and Forests in November, 1994.

Fellowships and Awards

- At a function organised at Rashtrapati Bhavan on 6.8.1994, the Indira Gandhi Paryavaran Puraskar for the years 1992 and 1993, IPVM Awards for 1991 and the National Awards for the Prevention of Pollution for the year 92-93, were given away by the Hon'ble President of India.
- Nominations for the first 'Mahavriksha Puraskar' have been invited and a Selection Committee has also been constituted.
- The Rajiv Gandhi Environment Award for Clean Technology for the year 1992 was awarded to M/s Rashtriya Chemicals and Fertilizers on 19.8.1994.
- The Pitamber Pant Fellowship Award for 1994 has been awarded to Dr. M.P. Nayar for his significant contribution to bio-diversity conservation.

Environmental Information

- ENVIS (Environmental Information System) network with its 20 ENVIS Centres on various subject areas continued its activities in environmental information collection, collation, storage, retrieval and dissemination to all concerned.
- During the year an ENVIS Centre in the field of Biogeochemistry and Environmental Law was set up in the School of Environmental Sciences, Jawaharlal Nehru University, New Delhi.
- ENVIS network, during the year, responded to 6721 queries out of which 905 were international and the remaining were national. ENVIS Focal Point also continued its quarterly publication viz., 'Paryavaran Abstracts' reporting environmental research in the Indian context.
- Networking of ENVIS Centres with the Focal Point vis-a-vis among themselves is being made through the ERNET Programme of the Department of Electronics. Various Centres have been provided the E-mail address to access available information in several scientific and research institutions, educational and other organisations of the country. The necessary hardware modem, software, etc. required for networking are being installed in a phased manner.
- ENVIS continued to act as the National Focal Point (NFP) and Regional Service Centre (RSC) for the South Asia Sub-region for INFOTERRA Network of United Nations Environment Programme (UNEP).
- The Library in the Ministry was enriched by procurement of about 20,000 documents including books, scientific and technical reports etc. and more than 200 national and international journals in environment and associated fields.
- All the 20 ENVIS Centres continued their activities in information collection, collation, storage, retrieval and dissemination in their specified subject areas and provided substantive information to their user groups in response to the queries received by them.

Legislation and Institutional Support

- The Gazette Notification on Environmental Impact Assessment has been amended.
- The Coastal Regulation Zone Notification has also been amended.
- The amendment to the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 have been notified.
- The Hazardous Wastes (Management & Handling) Rules 1989 are being amended.
- The Rules for Handling and Management of Bio-Medical Wastes have been finalised.
- Out of 6133 cases filed under the Water Act 1974 and the Air Act 1981 so far, 2635 cases have been decided and 3498 are pending in various courts.
- The scheme of assistance to the SPCBs and State/UT Departments of Environment was continued.

International Co-operation

- India is actively participating in the global debate on the implementation of Agenda 21; at the second session of the Commission on Sustainable Development held in New York in May, 1994, India has been elected to the Bureau of CSD as Vice-Chairman representing Asia.

- During a workshop "Towards Sustainable Forestry: Preparing for CSD 1995" sponsored jointly by the Government of India and the Government of U.K. and held at New Delhi in July, 1994, a draft framewrok has been prepared for providing national information to the CSD 95.

- A State of Environment Report is being prepared by the ESCAP for the Asia-Pacific Region and India's contribution to this report is being coordinated by the Ministry of Environment and Forests.

- Several steps have been initiated during the year to phase out ODS (Ozone Depleting Substances) as scheduled in India's Country Programme on the phasing out of ODS.

- Thirty Projects have been approved for funding by the multilateral fund set up under the Montreal Protocol.

- A Joint Project Steering Committee has been set up to select projects to be funded by the India-Canada Environment Facility; an amount of Rs. 55 crores is expected to be received by the Government of India under this facility.

- During the visit of Ms Hazel O'Leary, US Secretary of Energy, to India in July, 1994, a Joint Statement on "Energy Enhancing Technologies" has been signed by the Ministry of Environment and Forests with the US Energy Department.

- A Memorandum of Understanding in the field of Environment has been signed with Russia during the visit of the Prime Minister to Moscow in June, 1994.

- Twelve forestry projects are being implemented in seven States with financial assistance from the World Bank, SIDA, EEC, OECF (Japan), ODS (U.K.) and GTZ (Germany).

- Under Phase I of the World Bank Aided Industrial Pollution Control Project, establishment of about 35 CETPs have been approved by the Ministry; one demonstration project introducing energy and resource conservation measures has also been approved for a paper and pulp industry.

- Phase II of this project has also been approved with a total outlay of about 330 million US $, involving a line of credit of US $ 168 million and a counterpart fund of US $ 162 million to be provided by the GOI, State Governments, Financial Institutions and the concerned industrial units.

- Several projects on environmental audit, environmental quality management, clean technology for small scale industries etc, are being implemented with assistance from UNIDO.

- Bilateral programmes with countries such as Sweden, Norway, Denmark, Australia etc. continued to be implemented.

Advisory Inputs, Administration, Plan Co-ordination & Budget

Advisory Inputs

- The first meeting of the National Environmental Council was held on 25.4.94 under the Chairmanship of the Prime Minister.

Administration

- Under the Flexible Complementing Scheme, 89 Group 'A' Scientific Officers were reviewed and 72 were promoted.

- Fifty probationers have been appointed to the IFS by direct recruitment and 25 SFS officers have been inducted into the IFS by promotion.

- The Grievance Cell and the NGO Cell attended to a large number of complaints/queries received during the year.

- Two special drives were launched during the year to clear the backlog of recording and reviewing of files. A large spacious Record Room has been created to accommodate all the recorded files.

- The Committee set up to undertake periodical review of forms, reviewed 41 forms; two forms have been modified and four forms have been merged into two.
- The Committee set up in 1991 for undertaking work measurement study in respect of scientific and non-scientific posts in the Ministry has finalised its report.
- A total of 881 Parliament Questions pertaining to various aspects of environment were dealt with during the year.
- Twelve offices were inspected during the year to ensure effective implementation of the Official Language Policy.
- Under the scheme to encourage creative and original writing in Hindi on environmental topics, three prizes have been awarded.
- Publication of the quarterly Hindi journal 'Paryavaran' was continued.
- The Civil Construction Unit (CCU) has taken up 75 major schemes so far with a total estimated cost of Rs. 88 crores.

Plan Co-ordination and Budget

- The Budget Allocation of the Ministry for 1994-95 is Rs. 360 crores as against Rs. 318 crores for 1993-94.
- The total outlay for 1995-96 for the Ministry is Rs. 370.50 crores.

2

SURVEY OF NATURAL RESOURCES

Survey of Flora

The Botanical Survey of India (BSI) was established in 1890 with the objective of surveying and identifying the plant resources of the country. The survey has its head quarters at Calcutta and 9 Circles located in different phytogeographical regions of the country. The primary and secondary objectives of BSI after its restructuring are as follows:-

Primary Objectives

- To survey the plant resources of the country;
- To undertake and complete taxonomic studies of all the flora of the country;
- To enlist the endangered species, to undertake measures for the effective conservation and to collect and maintain germplasm and gene bank of endangered, threatened and vulnerable species;
- To bring out volumes of National and Stata Flora of States/Union Territories;
- To identify, collect and preserve specimens of plants which are economically and otherwise beneficial to human beings; and
- To prepare National Data Base of herbarium collections including types, live collections, plant genetic resources, plant distribution and nomenclature.

Secondary Objectives

- To undetake studies on selected critical and fragile ecosystems;
- To undertake assessment of flora relating to environmental impact studies as and when called for;
- To undertake ethnobotanical studies and evaluate plants of economic utility in specified areas; and
- To carry out geobotanical studies in specified areas.

The activities of the BSI during the year were as follows:-

Survey of Plant Resources of the Country

More than 30 exploration tours were undertaken by the various Circles and Units of the BSI in different priority areas of Assam, Manipur, Mizoram, Meghalaya, Karnataka, Maharashtra, Orissa, Sikkim, N.W. Himalayas of U.P. and Himachal Pradesh, Andaman & Nicobar Island. Nearly

4700 specimens were collected and these are being processed by the different Circles/Units.

National Flora/Flora of India

Revisionary studies of 4 species of Chenopodiaceae; genus Ecobolium (Acantheceae) and 6 species of Onagraceae

Fig. 3 *Paphiopedilum venustum* - A rare orchid from Tropical Rain Forests of Meghalaya and Sikkim

have been completed. Editing of the manuscript for volume 4 has been completed. Work on compilation of vol.5 (Olaceae-Connaraceae) has been completed, and the draft is being edited. Computerisation of the taxonomic data of sub-family Papilionoideae has been completed for the 6th volume. Computerisation of the manuscript for Flora of India, vol. 12 & 13 (Asteraceae) has been completed. Computer print outs of 6 tribes and 2 sub-tribes are being checked. Taxonomic description of 22 species of Moraceae, 12 species of Fagaceae and 12 species of Salicaceae have been completed for volume22.

State/Regional Flora

Assam : Taxonomic description of 150 species belonging to the family Ranunculaceae, Tiliaceae, Malvaceae, Asteraceae, Sabiaceae and Connaraceae have been completed. Description of 75 species have been completed in all respects.

Mizoram : Taxonomic description and nomenclature up-dating of 300 species have been completed and the report is being finalised.

Madhya Pradesh, Vol. 2 : Compilation and taxonomic description of 88 species have been completed.

Andaman & Nicobar : Taxonomic description and checking of nomenclature of 80 species belonging to the families Ranunculaceae, Ternstromoeaceae, Moraceae, Begonioaceae, Daticaceae, Cucerbitaceae, etc. have been completed. Manuscripts of 48 genera of 24 families of Monicot have been prepared; taxonomic description of 80 species of Monicot have also been completed.

Critical studies on 50 species have also beeen completed.

West Bengal : Manuscripts for the family Toricelleaceae, Nyssaceae and Corraceae have been revised and submitted. Taxonomic description of 50 species, tribe Desmodeae and family Rubiaceae have been completed.

Kerala Compilation and taxonomic description of 15 species belonging to family Hypericaceae, Theaceae, Guthiferae, etc. have been completed for inclusion in volume II.

Sikkim : Compilation and taxonomic description of 180 spp. of Dicot families have been completed for volume II.

Arunachal Pradesh : Compilation and taxonomic description of 97 spp. of Polygalaceae, Xanthonophyllaceae,

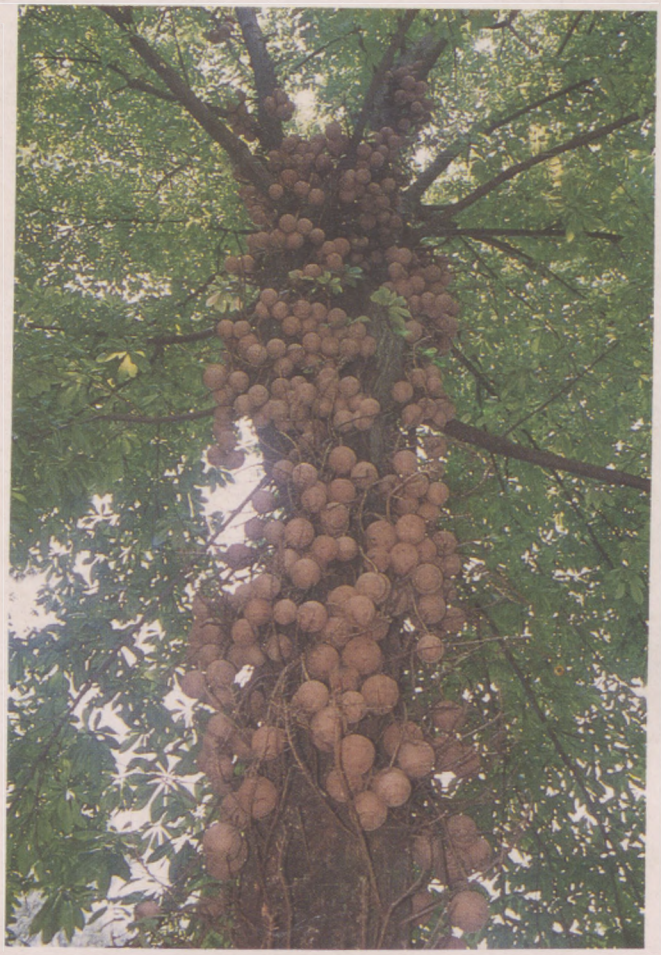


Fig. 4 A canon ball tree *(Couroupita guianensis* Aub) at the Indian Botanic Garden, Howrah

Fig. 5 An ornamental garden flower

Cariphyllaceae, Fumariceaceae, Brassicaceae, Rananculaceae, etc. have been completed.

Cold Desert : Checking of proof of the publication on "Biodiversity of Indian Cold Desert" has been completed.

Taxonomic description of 85 species belonging to the families Orchidaceae, Dioscoreaceae and Liliaceae have been completed.

South Western Ghat : Compilation and editing of the manuscripts for Sevagiri and Sethur hills of South Western Ghats have been completed.

Work on the Flora of Bihar and Teesta valley has been initiated.

Studies on Rare and Endangered Species

Compilation of data for inclusion in volume IV of the Red Data Book of Indian plants has been completed and materials for volume V are being collected. Multiplication of 8 rare and endangered species of plants has been completed under *ex-situ* conservation efforts.

Studies on Cryptogams

Pteridophytic Flora of India : Identification, writing and compilation of manuscripts for Polysticum, Arachnoidis and Colysis is in progress.

Higher Fungi of India : Description of 142 spp. have been completed in all respects. Manuscripts on Hymenochaetaceae of India is ready for publication.

Lichen Flora of India : 50 samples of Lichen have been worked out; taxonomic description of 15 spp. of Graphidaceae have been completed. Manuscript of Lichen Flora of Nagaland has been edited.

Fig. 6 The leaves of the giant water lily *(Victoria amazonica)* attain a diameter of over 5 feet and carry weight upto 42 kgs

Other Activities

- 13 journals have been checked and nomenclature updated; description of 37 species of cultivated plant have been completed for inclusion in the Manual of cultivated plants. Computerisation of type specimens of the BSI herbaria is under progress. The manuscript for live plant collection is being typed and plant distribution work is in progress.
- Evaluation of 5 species of useful plants have been completed.
- Manuscripts of Ethnobotany of Arunachal Pradesh and Nagaland have been completed. Compilation of data of Ethnobotany of Assam and Tripura is in progress.
- The Pollen Atlas of Indian plants has been prepared and pollen of 26 spp. of Berberidaceae have been studied.

Fig. 7 Wild jack-fruit tree of Andamans

- Under the studies on growth and development of economic plants, 5 plants have been introduced in gardens and field observations of various parameters were analysed.

Environmental Impact Assessment reports of the following projects were completed during the year :-

- Initial environmental examination of the Refinery Complex at Moti Khavati, Gujarat.
- Initial environmental protection PWD, Ullar reservoir scheme, Sivagiri Taluk, Tirunelveli-Katabomman district, Tamil Nadu.
- Survery report of the Right Fork valley of Kaloony River in North Andaman.
- Mongia irrigation dam project, Rajnandgaon.
- EIA report on Kundha additional division hydro electric project in Nilgiri, Coimbatore.
- Status Reports on Biodiversity of Namdapha Biosphere Reserve, Arunachal Pradesh and North Sikkim including Kanchandzonga National Park, have been prepared.
- Flora of Inventory of Great Nicobar Biosphere Reserve, has been prepared.
- An illustrated identification Manual for 12 species has been completed for TRAFFIC India.
- Nomenclature of 100 species were checked towards the preparation of plant Nomenclature Dictionary of Medicinal plants of India (INMED PLAN Project).
- Multiplication of endemic and threatened species through Tissue culture were carried out.
- An ENVIS Centre on plant ecology has been established at the BSI.
- New schemes have been undertaken for development of Botanic Gardens.
- A new project has been initiated for Ethonobotany.
- World Environment Day was observed by organising painting, poster and quiz competitions.
- A number of interesting ornamental horticultural house plants as well as plants of pomological and economic importance were displayed by the BSI during the 6th Annual Flower show organised by the Indian Botanic Garden.

Fig. 8 Foxglove *(Digitalis purpurea)*-a medicinal plant

Fig. 9 Betal nut-one of the Indian plants of economic value

- The Bicentenary Gate of the Indian Botanic Garden was inaugurated by the Honourable Minister for Environment and Forests on 15th July, 1994 at Calcutta. On this occasion two books titled "Manual of Cultivated Palms in India" and Bicentenary of Indian Botanic Gardens - A pictorial Glimpse" were also released by the Minister. Van Mahotsava was also celebrated on that day.

Publications of the BSI

- Bulletin of the Botanical Survey of India vol. 33.
- Fascicles of Flora of India No. 21.
- Vanaspati Vani vol. 5 (1994).
- Flora of Madhya Pradesh vol. I.

The following documents are under publication :-

- Bulletin of BSI vol. 34.
- Flora of India vol. IV (except Rutaceae & Meliaceae).
- Fascicles of Flora of India no. 22.
- Flora of India vol. xii & vol. xiii.
- Red Data Book of Indian plants vol. iv and v.
- Manuals of Rhododendrons in India.
- Flora of India, Introductory volume part - I.
- Flora of Maharashtra, vol. I.
- Mangroves of Krishna and Godavari.
- Mangroves of Goa.
- Mangroves of Mahanadi Delta.
- Annual Reports for 1990-91, 1991-92 & 1992-93

Survey of Fauna

The Zoological Survey of India (ZSI) with its headquarters at Calcutta and sixteen regional stations located in different parts of the country was established in 1916 with the main objective of carrying out surveys of the faunal resources of the country.

During the year, the ZSI's main thrust area of work continued to be exploration and survey of faunal bio-diversity. In this connection surveys were conducted throughout the country covering major ecosystems.

Highlights of the activities of the ZSI during the year were as follows :-

Exploration and Survey of Faunal Resources

Ecosystem survey : A total of 65 surveys covering 89 districts falling under different ecosystems were conducted during the year by the headquarters and other regional stations of the ZSI.

Tropical rain forest ecosystem : Surveys were conducted in the States of Arunachal Pradesh, Kerals (Kasargod district), Mizoram (Aizwal, Champhai, Kalasib, Sairang and Tamdil districts), Nagaland and Sikkim.

Fig. 10 Brahma Kamals *(Saussurea obvollata)*-a unique flowers in the alpine Himalayan Eco-system

Himalayan ecosystem : Surveys in Himachal Pradesh (Kangra and Mandi districts), Jammu and Kashmir (Ladakh Cold Desert) and Sikkim were undertaken.

Desert ecosystem : Exploration of Gujarat (Bharuch, Bhuj, Dangs, Surat and Valsad districts) and Rajasthan (Ajmer, Alwar, Dosa, Jaipur, Jalore, Jhunjhunu, Jodhpur, Sikar, Udaipur, Pichola Lake and Sambhar Lake) were undertaken.

Estuarine ecosystem : The newly emerged Nayachar Island, Sunderban (West Bengal), was surveyed.

Freshwater ecosystem : The Kolleru lake (Andhra Pradesh), was explored.

Marine ecosystem : Surveys in Andaman Island, Andhra Pradesh (coastal area) and Gulf of Mannar (Hare Island, Krusadi Island, Manaliputty Island, Pamban Island and Shighle Island) were conducted.

Survey of Conservation Areas : Faunistic surveys were conducted in certain conservation areas such as Bhim Shanker Sanctuary, Eravikulam National Park, Govind Pashu Vihar, Great Nicobar Biosphere Reserve and Melghat Tiger Project area. Surveys of Harike (Punjab) and Sukhna (Chandigarh) wetlands were also undertaken.

District-wise Survey

Under the district wise survey programme, explorations were carried out in Andhra Pradesh (Hyderabdd, Medak, Nalgonda and Rangareddy districts), Bihar (Aurangabad, Bokaro, Chhota Nagpur Coal Field areas, Dhanbad, Ranchi and Rohtas districts), Goa, Kerala (Kannur district), Madhya Pradesh (Bhind, Chhindwara, Damoh, Datia, Gwalior, Muraina, Sagar and Thikamagarh districts), Maharashtra (Khandla region), Orissa (Talsari), Pondicherry (Karaikal and Mahe), Sikkim (North), Tamil Nadu (Chidambaranar,

Fig. 11 Nilgiri langurs, *Presbytis johni* (Fisher), in Annamalai Hills, Tamil Nadu-persecuted for its fur and alleged aphrodisiac property of its flesh

Fig. 12 An Indian giant squirrel at the Bhim Shankar Wetland Sanctuary, Pune

South Arcot and Tirunelveli districts), Union Territory of Delhi and West Bengal (Asansol, Birbhum, Burdwan, Howrah, Apalchand forest range of Jalpaiguri and Midnapur districts).

Faunistic Studies

Status Survey of Endangered Species

Based on the field work already completed, publication of a series of reports on the status of Endangered Species has been initiated by the ZSI and the first report containing the latest information on the status of three mammalian species, viz. Golden Langur (*Presbytis geei* Khajuria), Phayres Leaf Monkey (*Presbytis phayrei* Blyth) and Hispid Hare (*Caprolagus hispidus* Pearson) was released.

State Fauna

Fauna of Meghalaya : Materials on various groups of animals particularly nematode and Platyhelminthes parasites of Vertebrates, Ephemeroptera, Odonata, Blattaria, Orthoptera (Acridoidea, Tetrigoidea and Tettigoniidae), Coleoptera (Carabidae, Cicindeliidae, Cerambycidae, Paussidae, aquatic Coleoptera), Lepidoptera (Danaidae, Papilionidae, Hesperiidae, Lymantriidae, Lasiocampidae and Zygaenidae), Hemiptera (scale insects and mealy bugs), Hymenoptera (Vespidae, Scoliidae, Sphecidae and Ichneumonidae), Pisces and Mammalia were worked out. Serveral scientific papers dealing with the above families were also prepared.

Fauna of Tripura : Material on Protozoa, Isoptera Coleoptera, Hymenoptera, Oribatid mites, Crustacea was studied.

Fauna of Manipur : Studies were conducted on Oribatid mites, Ixodid ticks, Mollusca, Crustacea and Pisces, the result of which would be included in the State Fauna Series.

Fauna of Himachal Pradesh : Studies on Oligochaeta, Pisces and Aves were conducted.

Fauna of Delhi : Insecta (Hymenoptera) and Pisces were studied.

Fauna of Uttar Pradesh : Studies were conducted on Pisces and Reptilia.

Fauna of Gujarat : Material on Crustacea, Mollusca and Pisces were studied.

Fauna of Sikkim : Based on the taxonomic studies of the fauna of the areas, Insecta (Lepidoptera and Isoptera) were worked out.

Fauna of Tamil Nadu : Studies on Cladocera, Millipeds, Insecta (Hemiptera), Pisces and Amphibia were in progress.

Fauna of Goa : Material of Pisces was worked out.

Fauna of Madhya Pradesh : Based on the taxonomic studies of the fauna of the area, Insecta (Odonata and Lepidoptera), Arachnida, Tetranychid mites, Crustaceas, freshwater fishes were worked out.

Fauna of Conservation Areas (Biosphere Reserves, National Parks and Tiger Reserves)

Insect specimens comprising of Coleoptera from Great

Fig. 13 The Chinkara *(Gazella dorcas)* -a shy, slender-bodied antelope-a vulnerable species

Fig. 14 A flock of blue sheep in their natural habitat at Ladakh

Nicobar Biosphere Reserve and Lepidoptera from Mt. Harriet National Park, South Andaman were studied at the Andaman and Nicobar Regional Station, Port Blair.

Identification of Insecta (Diptera, Hymenoptera and Lepidoptera) from Eravikulam National Park is in progress at Western Ghats Regional Station Kozhikode.

Studies were conducted on Rotifera, Ostracoda, Insecta (Diptera), Mollusca, Pisces and Amphibia of Melghat Tiger Project area; Reptile fauna from Corbett National Park; Insecta (Hymenoptera) from Govind Wildlife Sanctuary and Pisces of Dudwa National Park.

Fauna of Wetlands

Insecta (Odonata and aquatic Hemiptera) and Cladocera of Ujani wetland and Annelida (Oligochaeta) of Sukhna wetland were under study. Biotic and abiotic factors of Ujani wetland were analysed for incorporating the conclusions in the final report. Aquatic Hemiptera and Coleoptera of Damodar River were identified. Surveys of Kolleru Lake and Damodar Valley were undertaken for further investigation.

Fauna of Ecosystems

Desert ecosystem : Studies on Nemathelminthes (Plant nematodes) infesting crops of economic importance and Insecta (Coleoptera) were in progress.

Marine and coastal ecosystem : Marine ecosystem was explored by studying Mollusca (Gastropoda) and Pisces from coral reefs of Andaman and Nicobar Islands. Chaetognatha, Coelenterata (Sea anemon) Crustacea, Marine Mollusca and Pisces from Gujarat Coast, Gulf of Mannar and Cepholopods from West Coast of India were worked out.

Tropical rain forest ecosystem : Insecta (Lepidoptera,

Fig. 15 A tree frog

Diptera and Hymenoptera), Crustacea, Pisces and Amphibia of N.E. India and Western Ghats, Kerala were studied.

Ecological studies : Observations on the ecological succession at a newly emerged Nayachar Island, Sunderban Delta, West Bengal were recorded during pre-monsoon, monsoon and post-monsoon period. Some valuable information relating to population fluctuation in Isopoda, Insecta (Collembola, Diptera, aquatic Coleoptera and Hymenoptera) and Acarina was also recorded.

Environmental Impact Assessment Studies

A survey was conducted in the neighbouring areas of Teesta-Jaldhaka Main canal to explore the ecological conditions and collect the fauna of the area. A preliminary report has been prepared.

A total of 9 impact assessment surveys relating to three Hydroelectric, four Irrigation and two Multipurpose projects were conducted by the Western Regional Station, Pune, during the year.

Development of National Zoological Collections

The National Zoological Collections were further enriched by the addition of 71,460 identified specimens pertaining to 2455 species of diverse groups of Indian fauna. These include 59 examples of 12 species described as new to science by the staff of the Survey.

Identification and Advisory Services

The ZSI continued to render identification and advisory services to various research and teaching institutes in India and abroad, different Central and State Government Departments and individuals. During the period under report 1205 zoological specimens pertaining to 137 species were identified. In addition 139 enquiries of scientific and technical nature requiring information and advice on various zoological and allied problems were also attened to.

Other Activities

- The Eighth Training Course on ''Collection, Preservation and Identification of Insects and Mites of Economic Importance'', was organised by the ZSI at Calcutta from March, 7-16, 1994, in which various participants from outside bodies and the Department took part.
- World Environment Day was celebrated by the ZSI on 6th June, 1994 at Calcutta.
- The animal Ecology Gallery of the Indian Museum, Calcutta developed by the Zoological Survey of India was inaugurated by the Vice Chancellor, University of Calcutta on 1st July, 1994, the 78th foundation day of the ZSI.
- Forest Week celebrations were initiated on 15th July, 1994 at Calcutta by the Honourable Union Minister of Environment and Forests, by planting a sapling at the New Alipur building premises. the Minister also addressed the members of the staff and released two documents entitled ''Red Data Book on Indian Animals'' and ''Status Survey of Endangered Species'' on this occasion.

Fig. 16 Scarce Evening Brown (*Cyllogenes janetae* de Niceville) - an endangered species

Fig. 17 Mangrove vegetation in Upputhanni Island

- At a function organised at Jubleee Hills National Park, Hyderabad on 11.8.1994, a volume on the Fauna of Andhra Pradesh, Pt. I, dealing with reptilia, amphibia and fresh water fishes was released by the Honourable Chief Minister of Andhra Pradesh.
- During the Wildlife Week, several activities were organised at Calcutta including a scientific colloquium, lectures and film shows on wildlife.
- Hindi Day was observed at the Headquarters on 7th October, 1994, by organising debates in Hindi.
- The foundation stone for the office-cum-research laboratory of the Arunachal Pradesh field station of the ZSI was laid by the Honourable Chief Minister of Arunachal Pradesh on 19th October, 1994. The residential complex for the staff was also declared open on the occasion.
- The Director and other senior staff members of the ZSI participated in several national and international seminars, workshops, conferences, etc. during the year and presented scientific papers.

Publications of the ZSI

- Status survey of endangered species, Report I.
- Annual Report of Z.S.I. for the years 1985-88, 88-89, 89-90, 91-92 and 92-93.
- Rec. Zool, Surv. India, Occ. Paper, No. 156. The hawk moths (Lepidoptera : Sphingidae) of Kumaon N. India - a probable case of Faunal Drift - Peter Smetacek.
- Rec. Zool. Surv. India, Occ. Paper No. 157. Caryphyllidean Cestode fauna of India - M. Haffezullah.
- Rec. Zool. Surv. India, Occ. Paper, No. 159. Marine timber destroying organisms of the A & N Islands and Lakshadweep Archepelago - N. Balakrishna Nair & M. Salim.
- Rec. Zool. Surv. India, Occ. Paper, No. 164. Anopluran fauna of India, the sucking lice infesting domesticated and wild mammals - C.C. Adhikari & A. K. Ghosh.
- Rec. Zool. Surv. India. Occ. Paper No. 165. Aquatic and semiaquatic Hemiptera (Insecta) of Tamil Nadu-I Dhumapuni and Pudukottai Districts - G. Therumallai.
- Rec. Zool. Surv. India, Occ. Paper No. 166. Observations on the habits and habitats of adult dragonflies of Eastern India with special reference to the fauna of W. Bengal - T.R. Mitra.
- Rec. Zool Surv. India., Occ. Paper No. 167. Termite fauna of the A & N Islands, Indian Ocean - P.K. Maiti & S. Chakraborty.
- Rec. Zool. Surv. India, 92 (1-4), 93 (1-2) and 94 (1).
- Mem. Rec. Zool. Surv. India, 18 (1).
- Mem. Rec. Zool. Surv. India, 18 (2). anuran Fauna of India - S.K. Chanda.
- The Red Data Book on Indian Animals, part I : Vertebrata (Mammalia, Aves, Reptilia and Amphibia).

Forest Survey of India

The Forest Survey of India (FSI) is entrusted with the task of Survey of forest resources of the country. With its headquarters at Dehradun and four zonal offices located at Bangalore, Calcutta, Nagpur and Shimla, the FSI has the following objectives.

- To assess the extent of forest cover and monitor on a two year cycle the broad changes in forest vegetation cover of the country by using multisatellite data on 1 : 250,000 scale.
- To prepare thematic maps through use of remote sensing data with maximum essential ground truth verification on a ten year cycle (Most ground truth verification would be done by respective States).

Fig. 18 A view of the Nilgiri Sholas-home to many exotic animals and plants

- To collect, store and retrieve necessary forestry and forestry related data for National and State level Planning and to create a computer based National Basic Forest Inventory System (NBFIS).
- To design methodologies relating to forest survey and subsequent updating. This would include methodologies for ;
  - Vegetation mapping including thematic maps through the use of satellite imageries/aerial photographs.
  - Ground truth verification and
  - Growing stock and volume assessment.
- To undertake forest inventory work in selected areas.
- To impart training in application of remote sensing techniques etc. in modern forest survey techniques to foresters at various levels of responsibility in the States/ UTs/GOI.
- To keep abreast of the achievements in remote sensing technology and also build up a strong research and development base in remote sensing in the field of forestry alongwith development of new algorithms and software for both image processing and general application.
- To support and oversee techniques/inventory work undertaken by States/UT Forest Departments.

The activities of the FSI during the year were as follows :

Thematic Mapping

To depict the forest types, species composition, crown density of forest cover and other landuses, the FSI is engaged in the preparation of thematic maps on 1:50,000

scale by interpreting the details from aerial photographs which are procured from the Survey of India and interpreted by using stereoscopes. These maps are prepared for the entire country on 10 years cycle (1986-96). Every year about 5000 aerial photographs corresponding to 260 topographic sheets are interpreted. Since the beginning of thematic mapping cycle in 1986, the FSI has covered 2033 topographic sheets upto 1993.

Vegetation Mapping

The FSI has been assigned the task of preparing forest vegetation maps on 1:250,000 scale for the entire country on a two year cycle. This is with a view to knowing the exact situation of the forest cover in the country and also to monitor changes that have taken place. The fourth cycle assessment pertaining to the period 1989-91 has beeen completed and brought out in the form of State of Forest Report, 1993. According to this report, the forest cover of the country is 6,40,107 sq. kms., which is 19.47% of the total geographical area of the country. The fourth cycle assessment has indicated that there has been a net increase of 22 sq. kms. of forest cover since the third cycle assessment. The country as a whole is covered by 363 sheets on 1:250,000 scale. The yearly target for 2 year cycle works out to 181/182 sheets. Actual forest cover by Density Class and Comparative situation of forest cover -

Table-1

Actual Forest Cover by Density Classes (1993 Assessment)

(Sq. km.)

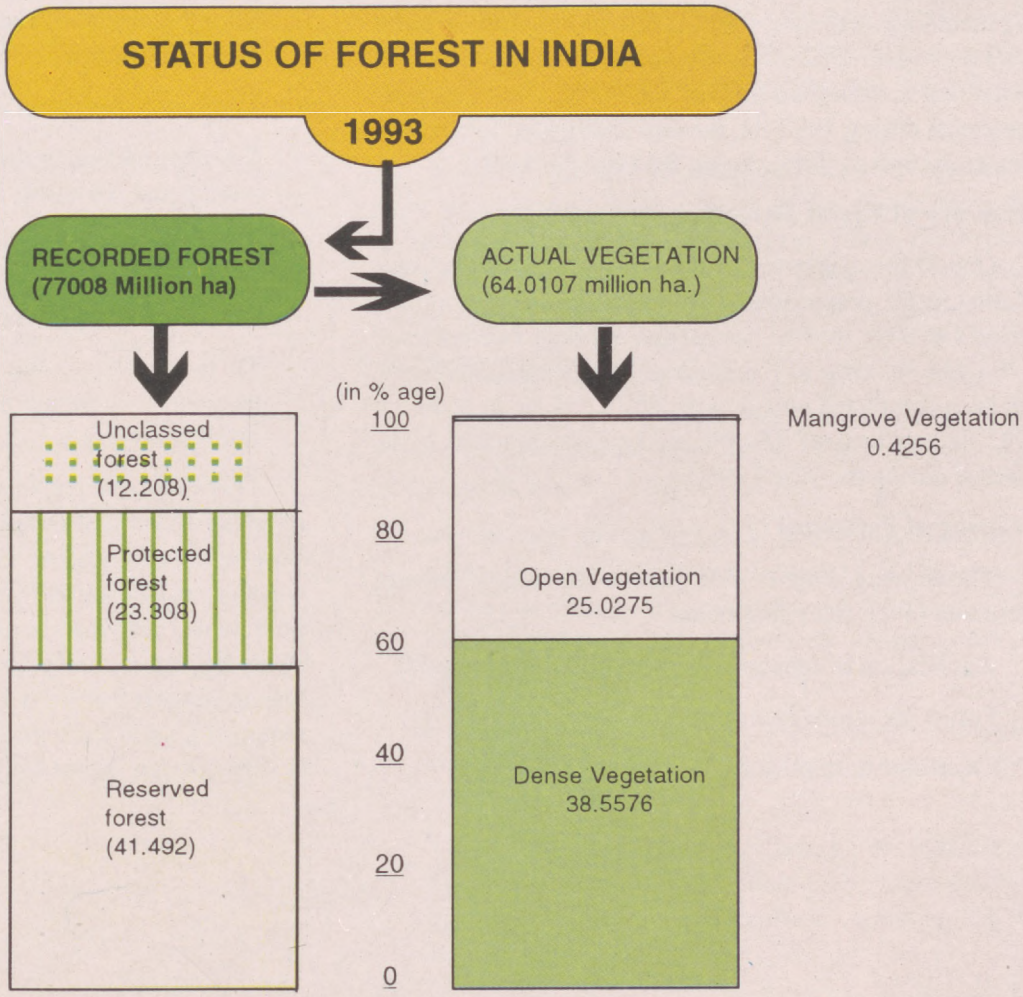
Sl. No.	State/UTs	Dense Forest (crown density) above 40%	Open Forest Crown density 10% to 40%	Mangrove	Total Forest covered area
1	2	3	4	5	6
1.	Andhra Pradesh	25,008	21,870	378	47,256
2.	Arunachal Pradesh	54,510	14,151	-	68,661
3.	Assam	15,998	8,510	-	24,508
4.	Bihar	13,172	13,415	-	26,587
5.	Goa	995	249	3	1,247
6.	Gujrat	6,301	5,324	419	12,044
7.	Haryana	329	184	-	513
8.	Himachal Pradesh	9,565	2,937	-	12,502
9.	Jammu & Kashmir	10,953	9,490	-	20,443
10.	Karnataka	24,852	7,491	-	32,343
11.	Kerala	8,421	1,915	-	10,336
12.	Madhya Pradesh	95,537	39,859	-	135,396
13.	Maharashtra	25,680	18,024	155	43,859
14.	Manipur	5,307	12,314	-	17,621
15.	Meghalya	3,305	12,464	-	15,769
16.	Mizoram	4,238	14,459	-	18,697
17.	Nagaland	3,487	10,861	-	14,348
18.	Orissa	27,151	19,799	195	47,145
19.	Punjab	481	862	-	1,343
20.	Rajasthan	3,581	9,518	-	13,099
21.	Sikkim	2,395	724	-	3,119
22.	Tamilnadu	9,422	8,283	21	17,726
23.	Tripura	1,819	3,719	-	5,538
24.	Uttar Pradesh	22,965	10,996	-	33,961
25.	West Bengal	3,362	2,705	2,119	8,186
26.	Andaman & Nicobar	6,567	91	966	7,624
27.	Chandigarh	4	1	-	5
28.	Dadra & Nagar Haveli	159	47	-	206
29.	Daman & Diu	-	3	-	3
30.	Delhi	12	10	-	22
31.	Lakshadweep	-	-	-	-
32.	Pondicherry	-	-	-	-
	Total	3,85,576	2,50,275	4,256	640,107

Table-2

Comparative Situation of Forest Cover-1993 and 1991 Assessment

(Sq. km.)

Sl.No.	State/UTs	1991 assessment	1993 assessment	Change in 1993
1	2	3	4	5
1.	Andhra Pradesh	47,290	47,256	-34
2.	Arunachal Pradesh	68,757	68,661	-96
3.	Assam	24,751	24,508	-243
4.	Bihar	26,668	26,587	-81
5.	Goa (including Daman & Diu)	1,255	1,250	-5
6.	Gujrat	11,907	12,044	+137
7.	Haryana	513	513	-
8.	Himachal Pradesh	11,780	12,502	+722
9.	Jammu & Kashmir	20,064	20,443	+379
10.	Karnataka	32,199	32,343	+144
11.	Kerala	10,292	10,336	+44
12.	Madhya Pradesh	135,785	135,396	-389
13.	Maharashtra	44,044	43,859	-185
14.	Manipur	17,685	17,621	-64
15.	Meghalaya	15,875	15,769	-106
16.	Mizoram	18,853	18,697	-156
17.	Nagaland	14,321	14,348	+27
18.	Orissa	47,205	47,145	-60
19.	Punjab	1,343	1,343	-
20.	Rajasthan	12,835	13,099	+264
21.	Sikkim	3,033	3,119	+86
22.	Tamil Nadu	17,713	17,726	+13
23.	Tripura	5,535	5,538	+3
24.	Uttar Pradesh	33,609	33,961	+352
25.	West Bengal	8,015	8,186	+171
26.	Andaman & Nicobar	7,622	7,624	+2
27.	Chandigarh	5	5	-
28.	Dadra & Nagar Haveli	206	206	-
29.	Delhi	22	22	-
30.	Lakshadweep	-	-	-
31.	Pondicherry	-	-	-
	Total	639,182	640,107	+925



Based on the interpretation of the LANDSAT Imagery 1993

1993 and 1991 assessment are given in Table 1 and Table 2 respectively.

Electronic Data Processing

The FSI has an independent unit for processing data on forest inventory. This unit also functions as a National Forest Data Bank by storing relevant data on forest inventory. The objective of this unit is to provide qualitative and quantitative information about the forest resources (growing stock) within precision limits in preparing reports on potentiality and other forest based investigation in order to serve the data needs of development planning. While data processing covering an area of 29,365 sq. kms. has been completed during 1993-94, the unit is targetted to cover an area of 26,000 sq. kms. during the year 1994-95.

Inventory of Forest Resources

One of the objectives of the FSI is to undertake work relating to the preparation of forest inventory. During the period 1981-93, the FSI has carried out field inventories in 3.76 lakhs sq. kms. of forest areas. While forest inventory has been completed over an area of 32,355 sq. kms during 1993-94, an area of 26,000 sq. kms. is targetted to be covered during the year 1994-95.

Training of Personnel

The training wing of FSI imparts training to forestry personnel in the following fields :-

- Application of remote sensing techniques in forestry.
- Forest inventory management.
- Electronic data processing.
- Ground truth verification of vegetation/thematic maps.

Against a target of 90 persons for the year 1994-95, 69 persons have been trained upto November, 1994.

Digital Image Processing and National Forest Data Management Centre

The National Forest Data Management Centre (NFDMC) was created under the FSI during 1987, with the following objectives :

- To assess the the extent of forest cover of the country by using multi-satellite data;
- To classify the forest cover by density classes;
- To create and maintain forestry data base by collection, storing and retrieving forestry related data;
- To keep abreast of recent advances in remote sensing technology and also build up a strong development base in forestry remote sensing;
- To train staff in the application of remote sensing techniques, computerised data base management and forest inventory.

This Centre is responsible for digital image analysis, computer aided cartography and development of suitable Geographic Information System (GIS). An image analysis system configured around VAX-II/780 has been installed at Dehradun. Techniques to identify the important forest types by density classes and preparation of vegetation maps have been developed by the NFDMC. Efforts are being made to acquire a Digital Cartography System and map production facility through global tenders.

3

CONSERVATION OF NATURAL RESOURCES INCLUDING FORESTRY AND WILDLIFE

Conservation Strategy and Policy Statement on Environment and Development

The National Conservation Strategy and Policy Statement on Environment and Development, 1992, the National Forest Policy, 1988 and the Policy Statement for Abatement of Pollution, 1992 are the major policy instruments of the Government for dealing with various facets of environment and development in a comprehensive manner. These documents also form the basis for devising norms and regulations for ensuring integration of environmental considerations in the development activities of the various sectors, thus paving the way for achieving sustainable development.

To ensure that all the concerned Ministries/Departments take appropriate action, especially for re-orienting their policies and programmes in conformity with the strategy, the action points pertaining to particular Ministries/ Departments have been communicated to them.

Biosphere Reserves

The Biosphere Reserve Programme is intended to conserve representative ecosystems. The objectives of the programme are;

- To conserve the bio-diversity and genetic integrity of plants, animals and micro-organisms in their totality as part of the natural ecosystems. so as to ensure their self-perpetuation and unhindered evolution of the living resources:
- To promote research that would assist ecological conservation both within and areas adjacent to these reserves:
- To provide facilities for international cooperation and people-environment interaction in a whole range of bioclimatic and biogeographical situation of the Biosphere: and
- To provide opportunities for peoples' participation in achieving these objectives.

The following Biosphere Reserves have been set up so far:

- Nilgiri in the States of Karnataka, Kerala and Tamil Nadu;
- Nanda Devi in Uttar Pradesh;
- Great Nicobar in Andaman & Nicobar Islands;

- Gulf of Mannar in Tamil Nadu;
- Sunderbans in West Bengal;
- Nokrek in Meghalaya;
- Manas in Assam; and
- Simlipal in Orissa.

The Simlipal Biosphere Reserve has been established during the year.

The Management Action Plans for Nilgiri, Sunderbans. Gulf of Mannar, Nokrek, Nanda Devi and Andaman & Nicobar Biosphere Reserves, have been approved by the National Committee on Biosphere Reserves during the year.

The Action Plans include :

- Formulation of eco-development and demonstration projects;
- Social welfare activities;
- Conservation plans for key species;
- Education, training and creation of awareness among the local people etc.

Wetlands, Mangroves and Coral Reefs

Wetlands

Wetlands are areas of marshes, fens, peatlands, bogs, shallow ponds, littoral zones of large water bodies, tidal marshes, etc, In India wetlands are distributed in different geographical regions. They provid the habitats for a gamut of flora and fauna and also serve as important life support systems by performing significant functions in flood control, recharging of ground water, regulation of hydrological regime and in reduction of sediment load as well as pollution.

Realising the importance of wetlands, a National Committee on Wetlands, Mangroves and Coral Reefs has beeen constituted to advise the Government on Policy guidelines for implementing programmes of conservation, management and research relating to wetlands. The broad components of a management action plan of a wetland include survey and demarcation, notification, wildlife

Fig. 19 Bharal herd *(Pseudois nayaur)* at Nanda Devi Biosphere Reserve

Fig. 20 A flock of flamingoes presents a breath-taking view

conservation, development, protection, environmental awareness, etc. State level Steering Committees have been constituted for formulation and implementation of management action plans. So far, 21 Wetlands have been identified for intensive conservation and management purposes, which are as under :

Name of the Wetlands	States
Kolleru	Andhra Pradesh
Wullar and Tse Morari	Jammu & Kashmir
Chilka	Orissa
Loktak	Manipur
Bhoj	Madhya Pradesh
Sambhar and Pichola	Rajasthan
Sasthamkota and Ashtamudi	Kerala
Nalsarovar	Gujarat
Harike, Kanjali and Ropar	Punjab
Ujni	Maharashtra
Renuka, Pongdam Tank and Chandratal	Himachal Pradesh
Kabar	Bihar
East Calcutta Wetland	West Bengal
Sukhna	Chandigarh

Management Action Plans have been drawn up for 12 wetlands so far. During the year 1994-95, financial assistance was provided for the following wetland areas;

- Loktak (Manipur)
- Deeper Beel (Assam)
- Pong Dam (Himachal Pradesh)

A Technical Advisory Committee for Loktak Lake has been constituted to suggest measures for conservation of the lake and draw up a management action plan.

India is a signatory to the Convention on Wetlands of International Importance especially as Waterfowl Habitat, generally referred to as Ramsar Convention (1971). The following six wetlands have been designated under the Convention;

- Chilka (Orissa)
- Keoladeo Ghana National Park (Rajasthan)
- Sambhar (Rajasthan)
- Wullar (Jammu & Kashmir)

Fig. 21 A close-up view of a Sarus crane-now a declining species in the wetlands of Northern India

- Loktak (Manipur)
- Harike (Punjab)

India participated in the Fifteenth Meeting of the Ramsar Standing Committee held in Budapest, Hungary, in October, 1994 and played a key role in promoting wetland conservation. In the meetings of the Standing Committee of Ramsar Bureau held in Gland in 1993 and Budapest in 1994, it has been decided to organise an Asian Regional Meeting of the contracting Parties to Ramsar Convention in New Delhi during 23rd-25th March, 1995.

A Training Workshop on Wetland Management was jointly organised by the Ministry of Environment and Forests and World Wide Fund for Nature in India at Keoladeo Ghana National Park, Bharatpur in January, 1994. The main objectives of the workshop was to expose officials associated with the management of India's six Ramsar sites and other major wetlands to the needs, principles, concepts and scientific techniques of wetland management.

Mangroves

Mangroves are salt tolerant forest ecosystems, found mainly in the tropical and sub-tropical intertidal regions of the world. They are reservoirs of a large number of plant and animal species associated together over a long evolutionary time and exhibiting remarkable capacity for salt tolerance. They stabilise the shoreline and act as a bulwark against encroachment by the sea. the rich biological diversity provides sources of livelihood for the people around. Some mangroves are sources of flourishing apiary industries.

The Indian Pacific Region is known for its luxuriant mangroves. The total area of mangroves in India is estimated to be 6,740 Sq. Kms., which is about 7% of the world's mangroves. Out of this, Sunderbans of West Bengal and Andaman and Nicobar Islands constitute about 80% of the mangroves in India. the remaining are scattered in the States of Andhra Pradesh, Tamil Nadu, Orissa, Maharashtra, Gujarat, Goa and Karnataka.

A National Committee on Wetlands, Mangroves and Coral Reefs has been constituted to advise the Government on appropriate policies and action programmes for conservation and management of mangroves. Fifteen mangrove areas have been identified in the country for intensive conservation and management purposes. Management action plans for all the areas have been drawn up. The main components of the management action plans include survey and demarcation, natural regeneration, afforestation, nursery development, protection, education and awareness creation, etc. At the State Government level, Steering Committees have been constituted under the chairmanship of the Chief Secretary of the concerned State to formulate and implement management action plans for the identified areas. Management action plans for all the fifteen mangrove areas have been sanctioned.

Coral and Coral Reefs

The term 'Coral' refers to a particular class of animal belonging to phylum Cnidera (Coelenterata), secreting a calcareous skeleton. The adult form is that of a polypermanently attached inside a limestone cup called a corallite which the individual secretes and expands in height as it grows. These corals form a ridge of limestone, the upper surface of which lies near the level of the sea. There are three types of coral reefs - (i) Fringing reef; (ii) Barrier reef; and (iii) Atoll.

The major reef formations in India are restricted to Gulf of Mannar, Palk Bay, Gulf of Kutch, Andaman & Nicobar and Lakshadweep Islands. With the exception of Lakshadweep reefs which are atolls, others are all of fringing type. Besides these, patchy coral growth is present at the inter-tidal areas of the Central West Coast.

Taking into consideration the importance of reefs and the factors responsible for their deterioration, following areas of the country have been identified for conservation

and management;

- Lakshadweep
- Andaman & Nicobar
- Gulf of Mannar
- Gulf of Kutch

The National Committee constituted for conservation and management of wetlands and mangroves, also oversees the formulation and implementation of programmes of Conservation, management and research on coral reefs. State level Steering Committees have also been constituted for the formulation and implementation of the management action plans for the identified areas and a management action plan for coral reefs of Andaman & Nicobar has been sanctioned.

Lake Conservation

Lakes constitute an important component of our freshwater systems. Many of the lakes in different parts of the country have been formed through natural process, while several others are man-made. These water bodies provide habitats and breeding grounds for a variety of birds, fish and other aquatic life both faunal and floral. Lakes and other wetlands (shallow water bodies) serve as important life-support systems by helping in flood control, recharging of ground water and regulation of the hydrological regime.

Due to pressures of human activities, a number of lakes are shrinking or getting polluted beyond the point of recovery. Encroachments, siltation, weed infestation, discharge of domestic sewage, industrial effluent and surface run-off carrying pesticides and fertilizers from agricultural fields are among the major threats. The symptoms of pressures due to encroachment and incursions are already experienced in the form of decrease in migratory bird population, fish and other fauna, poor water quality and prolific growth of obnoxious weeds (eutrophication).

The National Lake Conservation Plan (NLCP) proposes to augment the on-going programme on wetlands by undertaking large scale conservation activities in selected lakes, including those which are not covered under the

Fig. 22 The characteristic prop roots and pneumatophores help mangroves survive in waterlogged habitats

Fig. 23 Chilka Lake-a wetland of international importance - the largest brackish water coastal lagoon in Asia

existing programme. To begin with, the NLCP will concentrate on urban lakes; the scope of activities will be expanded gradually to include rural water bodies also.

The following activities are envisaged under the NLCP :

- Formulation of perspective plans for conservation based on resource surveys using remote sensing technology and Geographical Information System (GIS).
- R&D studies on floral and faunal bio-diversity and related ecological aspects.
- Prevention of pollution from point and non-point sources.
- Catchment area treatment.
- Desilting and weed control
- Other location-specific activities such as an integrated developmental approach, including interface with human populations.

Bio-diversity Conservation

The scheme on biodiversity conservation was initiated during 1991-92 to ensure proper coordination among various agencies concerned with issues relating to conservation of biological diversity, and to review, monitor and evolve adequate policy instruments for the same.

The Convention on Biological Diversity, which was signed by 171 countries including India, during Rio and thereafter, came into force with effect from 29th December 1993. India has ratified the Convention on 18th February 1994, and this convention has come into force for India from 19th May, 1994 i.e. 90 days after the ratification.

Subsequent to the signing of the convention by India, extensive consultations have been organised at the National and State levels to analyse the implications of the provisions of the Convention. As a result, 50 action points have been identified for implementation at the National, State and local levels. Of these, 26 action points require the active participation of NGOs for implementation.

The process of consultation at various levels initiated following the signing of the Convention on June, 1992,

was continued during the year. For the 50 priority action points identified from the Convention, lead organisations/ experts in the following specic areas have been identified for preparing reports:

- Survey, identification and monitoring
- *In-situ* conservation
- *Ex-situ* conservation
- Sustainable use
- Access to and transfer of technology
- Research, training and co-operation
- Legal measures
- Strengthening impact assessment procedures
- Biosafety

The drafts of Volume-II of the Comprehensive "Status Report on Bio-diversity Conservation" have been received and are now being finalised for publication.

An analysis of the 24 existing Central laws relevant to biological diversity has revealed that there are significant gaps in the existing legal/regulatory measures to ensure conservation of biodiversity. Deep public concern has been expressed often over the free movement of genetic material from our country, which continues unhindered in the absence of a comprehensive legal framework to regulate it. Action has therefore been initiated to regulate the transfer of indigenous genetic material from the country.

Fig. 24 Kaiser-I-Hind *(Trinopalpus imperialis* Hope)-A rare butterfly from Tropical Forests of India

Keeping in view the provisions of the Convention, the main elements for inclusion in a comprehensive act on biodiversity are being identified following deliberations with the concerned Ministries, Departments and Government and Non-Government agencies.

The Ministry has initiated an exercise for formulation of a National Action Plan on Biodiversity, for which a Core Group of experts has been constituted. A detailed framework of the Action Plan has been prepared and the various action points have beeen categorised into the following five major groups for which identified experts

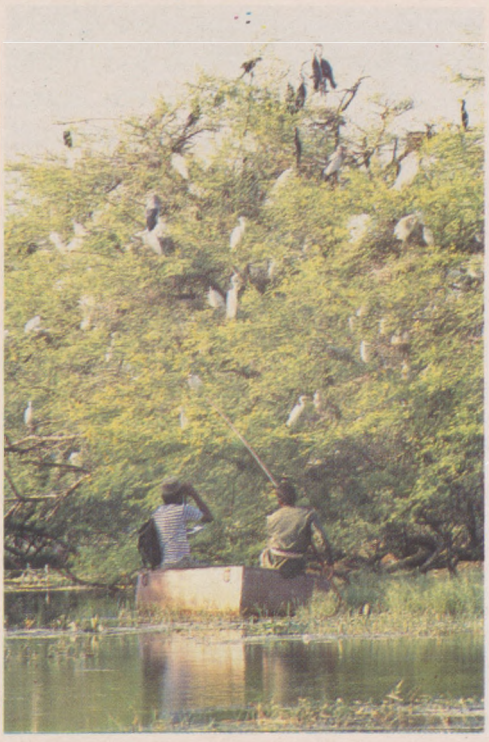


Fig. 25 A mixed flock of cormorants, storks and herons roosting on a tree top

are preparing the Action Plan:

- Documentation, conservation, research and monitoring.
- Sustainable utilisation, public participation and benefit sharing.
- Formulation of policy and planning, generating finances.
- Institution building activities, technology development programme and human resources development.
- Legal measures, biosafety.

The Ministry of Environment and Forests with support from UNEP. had organised an official level meeting among SAARC. ASEAN and other countries of the region, in Bangalore during 22-23 August, 1994. The main objective of this International Consultation was to evolve mechanisms for regional co-operation on issues related to biological diversity keeping in view the provisions of the Convention. Eleven countries of the region namely: Afghanistan, Bangladesh, Bhutan, India, Japan, Male, Malaysia, Myanmar, Phillippines, Thailand and Vietnam, participated in the Consultation. Observers from seven international organisation, some NGOs, State Government officials, eminent scientists and experts also participated.

An Indian delegation participated in the second meeting of the Inter-Governmental Committee on the Convention of Biological Diversity (ICCBD) held in Nairobi during June-July, 1994 in which India was elected as Vice-Chairman for one of the working groups.

India also participated in the first meeting of the Conference of Parties to the Convention held in Nassau, the Bahamas in Nov-December, 1994. A brochure on 'Conservation of Biological Diversity in India: An Approach', was brought out by the Ministry on this occasion. Follow-up action on the decisions taken in the Bahamas Conference has been initiated by the Ministry.

International Convention to Combat Desertification

An Inter-Governmental Negotiating Committee on Desertification (INCD) was established through a Resolution of the General Assembly of the United Nations soon after the convening of the United Nations Conference on Environment and Development at Rio-de-Janeiro in June, 1992, in which India was represented, the draft International Convention to Combat Desertification was finalised.

Fig. 26 The sacred "Shank" (*Turbinella pyrum*) - fished indiscriminately in the Gulf of Mannar area

India has signed the Convention on 14th October, 1994 at Paris. In pursuance of article 9 and 10 of the Convention each affected country is required to prepare a National Action Programme to identify the factors contributing to desertification and to provide for practical measures necessary to combat the same and to mitigate the effects of drought. With this objective in view, an Interministerial Committee has been constituted under the chairmanship of Secretary (E&F) for preparing a National Action Programme for India to combat desertification and to mitigate the effects of drought.

Ex-situ Conservation

Assistance to Botanic Gardens

The scheme was initiated during 1991-92, to augment the activities for conservation and propagation of plant genetic resources in different regions of the country through a network of botanic gardens. Under this scheme, a one-time non-recurrring grant is provided to botanic gardens in different phytogeographic regions for strengthening their existing facilities so as to undertake conservation and propagation of threatened and endangered endemic plant species of that region and for creating public awareness about the need to do so.

An Expert Group has been constituted for screening and examining the proposals received from various research Institutes/Universities/State Governments/Union Territories for strengthening the facilities of their existing botanic gardens. The Botanical Survey of India (BSI) has also prepared a list of some of the most vulnerable or endangered plants in different phytogeographic regions of the country that need to be conserved and propagated on a priority basis.

Pursuant to the decision taken at the meeting of the Expert Group on Botanic Gardens held on 2.8.1994, the Director, BSI, arranged for physical inspection of six botanic gardens in the country, based on which, five proposals for strengthening five botanic gardens were forwarded to the Ministry. Three proposals from the State Government of Tamil Nadu and the universities of Jammu and Guwahati have been approved for assistance.

Fig. 27 Desert ecosystem-the lives of local people are inter-connected with nature and natural resources

Central Zoo Authority

The Central Zoo Authority (CZA) established under the provisions of the Wildlife (Protection) Act, 1972 to support, oversee, monitor and coordinate the management of zoos in the country, also confers recognition to zoos of the country.

The highlights of the CZA during the year are as follows:-

- Evaluation of 11 large, 8 medium, 9 small and 6 mini zoos have been completed by the evaluation team of the CZA.
- Stud books for the Asiatic Lion (*Panthera Leo persica)* and the Royal Bengal Tiger *(Panthera tigris tigris)* have been published.
- Inventory of stock of endangered species kept in various zoos has been completed.
- Research projects on DNA finger printing have been sanctioned to the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, with a view to ensuring genetic purity in assisting reproduction in endangered species.
- A workshop on various aspects of Zoo Management was organised in October, 1994. which was attended by scientists, zoo managers and wildlife officers.
- A training programme for zoo managers was conducted by the Wildlife Institute of India for 24 participants.
- The director of Padmaja Naidu Himalayan Zoological Park, Darjeeling, participated in a 4-week course on breeding of endangered species organised by the Jersey Wildlife Preservation Trust, U.K.
- Several staff exchange programmes between Indian and International Zoos have been approved.
- One male and three female Red Pandas have been received as gifts from European Zoos.
- The CZA released financial assistance to various zoos of the country during the year for improvement of animal housing and their upkeep.

Forest Conservation

Implementation of Forest (Conservation) Act, 1980

The Forest (Conservation) Act, 1980 as amended from time to time checks the indiscriminate diversion of forest land for non-forest purposes. Since the enactment of the Act in 1980, the rate of diversion of forest land has come down to around 25,000 ha. per annum from 1,43 lakh ha. per annum before 1980. Under this Act, prior approval of the Central Government is required before any forest land is diverted for non-forest purposes. As diversion of forest land is normally not favoured, permissions under the Act are difficult to obtain. The rare exceptions carry stipulations for compensatory afforestation and other conditions as laid down in the Act and the National Forest Policy, 1988.

Fig. 28 Wild gaurs, *Bos gaurus* (H. Smith), with calf-vulnerable to diseases transmitted by domestic cattle

The Forest (Conservation) Rules, 1981 framed under the powers vested with the Central Government, have been amended in 1987 and 1989. Detailed consolidated guidelines for diversion of forest land under the Forest (Conservation) Act, 1980 have been issued in October, 1992. As per the provisions of Forest (Conservation) Act, 1980, the State Governments/UTs are required to submit formal proposals for diversion of forest land for non-forest purposes in the prescribed proforma alongwith details such as flora, fauna, map of the area, compensatory afforestation proposed etc. The Regional Chief Conservator of Forests have been delegated with powers to decide proposals involving forest land upto 5 ha. except those pertaining to regularisation of encroachment and mining. Proposals involving forest land between 5-20 ha. are to be processed by the Regional Chief Conservator in consultation with State Advisory Group consisting of representatives of the concerned State Governments. Proposals involving more than 20 ha. of forest land are required to be placed before the Advisory Committee constituted under the Act for examination.

The present status of 6253 proposals received under the Forest (Conservation) Act, 1980 till 30.11.1994 is as follows :

Approved :	3232
Approved in principle :	393
Rejected on merit	816
Pending with State Govt. for want of information	1541
Withdrawn by State/UT Governments.	120
Pending with Central Govt.	151

Forest Legislation

The Indian Forest Act, 1927, which is the principal legislation regulating the management of forests by the States, is being amended, comments of the State Governments and the UT administrations on the draft amendment have been received and are being examined.

Fig. 29 A group of spotted deer and baboons-sharing a salt lick

Consultation have also been initiated with non-governmental organisations (NGOs) so that their views can also be adequately reflected in the final draft. The draft Act would be considered through joint and collective consultation in Inter-State Council. before finalisation.

Regional Offices of the Ministry-Monitoring of the Projects Approved Under Forest (Conservation) Act, 1980, and Environment (Protection) Act, 1986.

The primary functions of the six Regional Offices functioning at Bangalore, Bhopal, Bhubaneshswar, Lucknow, Shillong and Chandigarh are to monitor and evaluate on-going forestry development projects and schemes with specific emphasis on conservation of forests and to follow up the implementation of conditions and safeguards laid down by the Ministry for projects/activities, when environmental clearance is given. The Regional Chief Conservator of Forests (C) are empowered to decide cases for diversion of forest land for non-forestry purposes upto 5 ha. except those pertaining to mining and regularisation of encroachments. They have also been empowered to examine cases involving forest land between 5 ha. to 20 ha. in consultation with the State Advisory Group.

Regionwise targets for monitoring of cases under Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and their achievements during the year 1994-95 are given in Table-3.

Participatory Forestry Management

The National Forest Policy, 1988 envisages involvement of people in managing the forests to attain the desired goals of forest conservation, extension of tree cover and fulfilment of the fuel wood requirement of the people. Accordingly, the Government of India issued guidelines to the State Governments to formulate specific schemes on involvement of village communities and vouluntary organisations in protection and regeneration of degraded forests on the basis of sharing of forest produce. As a follow-up of these guidelines, 15 States have issued appropriate Government orders/resolutions enabling people's participation in management of forests on usufructs sharing basis. These States are: Andhra Pradesh, Bihar, Karnataka, Rajasthan, Gujarat, Madhya Pradesh, Orissa, Tamil Nadu, West Bengal, Himachal Pradesh, Haryana, Jammu & Kashmir, Maharashtra, Punjab and Tripura. The other States are being pursued to issue similar orders.

Associaton of scheduled tribes and rural poor in regeneration of degraded forests.

The National Forest Policy, 1988 provides for involvement of people in managing the forests to attain the desired objectives of forest conservation, extension of tree cover and meeting the requirement of the people. With this aim in view, a scheme "Association of scheduled tribes and rural poor in regeneration of the degraded forests on usufruct sharing basis" is being implemented from 1992-93. The objectives of the scheme are to associate scheduled tribes and rural poor in afforestation of degraded forests and to provide gainful employment and a sustainable economic base to these people. The scheme is being implemented through the State Forest Departments on the basis of projects formulated for the purpose. Apart from the wages for the work done by these people they are also entitled to usufruct rights and sharing of final harvest.

National Forestry Action Programme (NFAP)

Since the announcement of the National Forest Policy, 1988. a need has been felt to orient all on-going forestry programmes to meet the objectives set by it. Consequently, an intergrated perspective programme for long, medium and short-term development of the forestry sector at National and State level is being prepared taking into account all aspects of forestry and people's welfare. This is being done under the project National Forestry Action Programme (NFAP) with the assistance of UNDP and FAO, which became operational in July, 1993. Zonal Sector Review Reports under the NFAP have been prepared. Suitable organisations/institutions/individuals for consultancy in specific subject areas have been identified and preparation of consultancy reports is in progress, International consultants in the field of Resource Economics, Forest Industries Planning, Institution Development and Forest Sector Review have been appointed. A draft of the National Forestry Action Programme is likely to be ready soon.

Modern Forest Fire Control Methods

Realising the importance of Forest Fire Control, the Ministry continued the Centrally Sponsored Scheme of Modern Forest Fire Control with the following objectives:

- To control forest fire with a view to protect and conserve forest.
- To improve productivity of forests by reducing the incidents and extent of forest fires.

Table-3

Regional Offices	F (C) A (No. of Cases) Target 1994-95	Achievement up to Sept. '94	E (P) A (No. of cases) Target 1994-95	Achievement up to Sept. '94	Site inspection	No. of Cases Approved/processed under F (C) A upto 20 ha.)
Bangalore	175	94	80	56	17	10
Bhopal	175	17	80	05	39	34
Bhubaneshwar	175	110	80	100	--	--
Lucknow	175	64	80	48	51	72
Shillong	120	43	45	11	5	2
Chandigarh	80	41	35	15	-	34
Total :	900	369	400	235	112	152

- To devise test and demonstrate principles and techniques of prevention, detection and supersession of forest fires with the help of watch towers, wireless sets, hand tools etc. by setting up an effective communication network and training in the use of hand tools.

The scheme continued to be operated in the following 11 States of the country :

- Andhra Pradesh
- Bihar
- Gujarat
- Himachal Pradesh
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Orissa
- Uttar Pradesh
- Tamil Nadu

Wood Substitution

The recommendations of the Policy Advisory Group constituted to advise the Government of India on the implementation of the wood substitution programmes stipulated in the National Forest Policy, 1988, have been communicated to all the States and Union Territories for compliance. Follow-up action taken by the States are being monitored regularly.

Wildlife Conservation

The activities to implement the National Wildlife Action Plan were continued during the year. The major activities during the year are as follows:

- The network of protected areas now comprises 80 National Parks and 441 Wild life Sanctuaries covering about 1,48,700 Sq. Kms. area. This network is spread over all the biogeographic zones of the country including Himalayan, peninsular, marine, estuarine, riverine, mangrove and desert ecosystems.
- Wildlife Institute of India, organised 4 courses and 79 officers and students were trained during the year. Efforts to build-up professional managers for protected areas through training of professional cadre in all aspects of wildlife were continued at the Wildlife Institute of India. A number of research projects have been taken in hand: some research projects have been completed and reports published. Details of the WII are given under Chapters 7 & 8.
- Effective measures were taken for control of illegal trade in wildlife and its products at national and International level. A Committee appointed to look into the issues related to illegal trade in wildlife and wildlife products, has recommended several measures for

strengthening anti-poaching infrastructure in the report submitted to the Ministry. The report has also been circulated to States for comments and necessary action.

- The Indian Board for Wildlife (IBWL) has been reconstituted; it is headed by the Prime Minister and consists of 10 non-officials, 5 NGOs, 3 MPs and 30 official members. IBWL is the apex advisory body in the field of Wildlife Conservation in the country.
- One award and two fellowships namely - Rajiv Gandhi Award and Salim Ali/Kailash Sankhla Fellowships respectively have been instituted by the Ministry for giving recognition to the eminent officers and field workers for exemplary work in the field of Wildlife Conservation and Research.
- ET & T Corporation (Govt. of India Enterprise) was provided assistance for procurement, copyright and dubbing of video films on Wildlife and Nature Conservation. It has produced 32 cassettes on the subject in Hindi and English which are being circulated to State Governments for education and public awareness programmes in the States.

Enforcement of Wildlife (Protection) Act, 1972 and Import Export Policy

The Wildlife (Protection) Act, 1972 and the provisions of the convention on International Trade in Endangered Species (CITES) and Export and Import Policy of India continued to be enforced through the office of the Regional Deputy directors of Wildlife Preservation located at Delhi,

Fig. 30 A pair of Siberian Cranes wintering at the Keoladeo Ghana National Park

Fig. 31 The Indian wolf *(Canis lupas)* - becoming endangered due to hunting by village folk

Bombay, Calcutta and Madras with the help of State Wildlife Wings, State police, the Customs Department, BSF and Coast-Guards. Sub-regional Offices of Wildlife Preservation at Guwahati, Cochin and Pathankot have also been made functional. Several cases of poaching and illegal trade in wildlife products were detected.

Development of National Parks & Sanctuaries

Under the Centrally Sponsored Scheme, financial assistance for development of National Parks and Sanctuaries was provided to States and 32 National Parks and 171 Sanctuaries were assisted during the year. 100 percent assistance was provided on selected items of non-recurring nature to both National Parks and Sanctuaries & 50% recurring items were also supported in case of some National Parks.

Eco-development in and around National Parks and Sanctuaries

Assistance was provided to the States for taking up programmes of Eco-devlopment around National Parks and Sancturies including tiger reserves in order to achieve ecologically sustainable economic development of these areas and reduce the biotic pressure on protected areas for ecosystem conservation.

Strengthening Wildlife Management and Eco-development Planning Capabilities

The scheme was launched in the year 1993-94 and is being implemented through Wildlife Institute of India. Dehra Dun by providing financial support through UNDP and Government of India. Officers in different States have

been trained by the Wildlife Institute of India for preparation of Management Plans for 20 identified protected areas.

Officers from Wildlife Institute of India and various other States were trained in Wildlife management & eco-development planning capabilities as a part of the UNDP/ FAO Project.

Project Elephant

The 'Project Elephant', launched in 1991-92, aiming at ensuring long term survival of identified viable population of elephants and tackling the problematic elephant populations causing serious depredation was continued during the year. Works on the restoration of the lost and degraded habitats of elephants, mitigation of man-elephant conflict and establishment of data base on the migration

Fig. 32 A rare species of butterfly from Tropical Forests *(Bhutanitis lidderdalii* Atkinsaon)

and population dynamics of elephants have been taken up. Three regional workshops to finalise the elephant conservation action plan were held during the year.

Zoological Parks

National Zoological Park, New Delhi

One of the main objectives of the National Zoological Park at New Delhi is to create awareness amongst the visitors regarding nature conservation. To achieve this, the Zoo organised painting and essay-writing competitions, film-shows, cultural programmes, etc. on the Zoo Foundation Day and during the Wildlife-Week. The Zoo Foundation Day Function was presided over by the Hon'ble Minister for Environment and Forests.

Fig. 33 A group of spotbills with grey ducks at a wetland

A six-seater battery-operated trolley has been introduced in the Zoo during the year for the convenience of senior citizens and small children.

The Zoo continued to contribute to the conservation of rare and endangered animals by conducting research on their behaviour, reproduction and nutrition. It also continued assistance and guidance to other zoos in the country.

Padmaja Naidu Himalayan Zoological Park, Darjeeling

This Zoological Park in Darjeeling, an autonomous organisation of the State Government of West Bengal, houses and breeds a number of endangered and rare species of wild animals and birds of the Himalayan region. During the year, the Park continued its activities including research on the behaviour and breeding biology of the fauna of the East Himalayan region and provided visitors an opportunity to learn about the high altitude fauna and flora.

Project Tiger

The Centrally Sponsored Scheme 'Project Tiger' was launched on 1st April, 1973 to achieve the following objectives:

- To ensure maintenance of a viable population of tigers in India for scientific, economic, aesthetic, cultural and ecological values.
- To preserve for all times, areas of such biological importance as a national heritage for the benefit, education and enjoyment of the people.

Presently, there are twentythree Tiger Reserves in fourteen States of the Country covering an area of 33,000

sq. km. The list of Tiger Reserves is given at Table-4.

During 1994-95, an amount of Rs. 770 lakhs has been provided as central assistance for development and maintenance of Project Tiger areas. The State Governments contribute 50% of the recurrring cost of the scheme and all non-plan expenditure of the Tiger Reserves.

The major activities undertaken by the Project Tiger Unit during the year are as follows :

- The analysis and compilation of Tiger/Leopard census, 1993 has been completed for the entire country including the Tiger Reserve Areas.
- A 'Tiger Crisis Cell' has been set up to make special efforts to obtain various information essential for conservation of the Tiger and suggest remedial measures.
- The formation of a Global Tiger Forum for International cooperation has been initiated and an interim secretariat has been set up at New Delhi.
- During the year two new tiger reserves namely, Panna. (Madhya Pradesh) and Dampha (Mizoram) have been established.
- The preparation of a project document for eco-development activities with assistance from UNDP has been completed for eight selected States in the country and submitted to World Bank for necessary funding under the 'Global Environment Facility'.
- A launch workshop for starting eco-development activities under assistance of IDA for two protected areas were organised at Kullu (H.P.) and Kalakad (T.N.).
- Several grass-root level workshops were organised for initiating and encouraging people's participation in eco-development activities in different Tiger Reserves.
- A project report on management information system for Project Tiger areas has been prepared.
- Central assistance was provided to all Tiger Reserve areas for development and maintenance. The major activities include construction and strengthening of

Fig. 34 An elephant herd-its habitat requires rigorous protection

various buildings, roads, water conservation and communication network, setting up of research units, veterinary units and interpretation centres in all Tiger Reserves.

Animal Welfare

- The Animal Welfare Board of India, with its headquarters at Madras, is an autonomous body constituted in 1962 under the provisions of the Prevention of Cruelty to Animals Act, 1960. The Board consists of 28 members including 6 M.Ps (4 from Lol Sabha and 2 from Rajya Sabha). The functions of the Board are:

- to keep the law in force in India for the prevention of cruelty to animals under constant study and advise the Government on the amendments to be undertaken in any such law from time to time;

- to advise the Central Government on the making of rules under this Act with a view to preventing unnecessary pain or suffereing to animals generally, and more particularly when they are being transported from one place to another or when they are used as performing animals or when they are kept in captivity or confinement;

Table-4

Sl. No.	Name of Tiger Reserve	State	Total area (in Sq. Kms.)
1.	Bandipur	Karnataka	866
2.	Corbett	Uttar Pradesh	1316
3.	Kanha	Madhya Pradesh	1945
4.	Manas	Assam	2840
5.	Melghat	Maharashtra	1597
6.	Palamau	Bihar	1026
7.	Ranthambhore	Rajasthan	1334
8.	Similipal	Orissa	2750
9.	Sunderbans	West Bengal	2585
10.	Periyar	Kerala	777
11.	Sariska	Rajasthan	866
12.	Buxa	West Bengal	759
13.	Indravati	Madhya Pradesh	2799
14.	Nagarjun sagar	Andhra Pradesh	3568
15.	Namdapha	Arunachal Pradesh	1985
16.	Dudhwa	Uttar Pradesh	811
17.	Kalakad-Mundanthurai	Tamil Nadu	800
18.	Valmik	Bihar	840
19.	Pench	Madhya Pradesh	758
20.	Tadoba-Andheri	Maharashtra	620
21.	Bandhavgarh	Madhya Pradesh	1162
22.	Panna	Madhya Pradesh	542
23.	Dampha	Mizoram	500
		Total	33046

- to advise the Government or any local authority or other persons on improvements in the design of vehicles so as to lessen the burden on draught animals;
- to take all such steps as the Board may think fit for amelioration of animals by encouraging, or providing for the construction of sheds, water-troughs and the like and by providing for veterinary assistance to animals;
- to advise the Government or any local authority or other persons in the design of slaughter-houses or the maintenance of slaughter houses or in connection with slaughter of animals so that unnecessary pain or suffering, whether physical or mental, is eliminated in the pre-slaughter stages as far as possible, and animals are killed wherever necessary, in as humane a manner as possible;
- to take all such steps as the Board may think fit to ensure that unwanted animals are destroyed by local authorities, whenever it is necessary to do so, either instantaneously or after being rendered insensible to pain or suffering;
- to encourage, by the grant of financial assistance or otherwise, the formation or establishment of pinjrapoles, rescue homes, animals shelters, sanctuaries and the likes, where animals and birds may find a shelter when they have become old and useless or when they need protection;
- to co-operate with and coordinate the work of, associations or bodies established for the purpose of preventing unnecessary pain or suffering to animals or for the protection of animals and birds;

Fig. 35 The great Indian Bustard (*Ardeotis nigriceps* vigors) - encroachment of its habitat and hunting have greatly reduced its numbers

Fig. 36 A wild tusker-whose habitats demand protection

- to give financial and other assistance to animal welfare organisations functioning in any local area or to encourage the formation of animal welfare organisations in any local area which shall work under the general supervision and guidance of the Board;
- to advise the Government on matters relating to the medical care and attention which may be provided in animal hospitals and to give financial and other assistance to animal hospitals whenever the Board thinks it necessary to do so;
- to impart education in relation to the humane treatment of animals and to encourage the formation of public opinion against the infliction of unnecessary pain or suffering to animals and for the promotion of animal welfare by means of lectures, books, posters, cinematographic exhibitions and the like; and
- to advise the Government on any matter connected with animal welfare or the prevention of infliction of unnecessary pain or suffering on animals.

In order to involve the State Governments in animal welfare activities and to effectively implement the Prevention of Cruelty to Animals Act, 1960, all the State Governments were requested to constitute State Advisory Boards for Animal Welfare and to appoint nodal officers. Twenty-one States/UTs have so far notified the formation of such Advisory Boards and 29 States have appointed Nodal Officers for animal welfare. The Committee constituted under the Prevention of Cruelty to Animals Act, with the

main objective of supervising and controlling experiments on animals, has prepared a status report on the use of animals for experimental purposes in the country.

In collaboration with the Royal Society for Prevention of Cruelty to Animals, London, Animal Welfare Board of India is conducting a series of training programmes of 5 days duration each in different parts of the country to educate and train the members of SPCAs/Amimal Welfare Organisations, staff of other relevant departments and the general public. During the year 125 such camps have been held in different parts of the country. Animal Welfare Board of India celebrates Animal Welfare Fortnight from 14th January every year. During this period, rallies for the cause of animal welfare, painting competitions, radio talks, film-shows, etc. are arranged.

To commemorate the 125th Birth Anniversary of Mahatma Gandhiji, a Seminar on Animal Welfare was organised during 30th November-1st December, 1994 at New Delhi, by the Board which was presided over by Hon'ble Minister of Agriculture. A number of eminent Animal Welfare Activists from all over the country and abroad attended the seminar.

The budget allocation for the Animal Welfare Board of India for the year 1994-95 is Rs. 150 lakhs.

4

ENVIRONMENTAL IMPACT ASSESSMENT

Introduction

Environmental Impact Assessment (EIA) of development projects/activities is carried out with the objective of evaluating the adverse and beneficial effects of such activities on the society as well as on land, water, air, flora and fauna, and to incorporate suitable remedial measures at the project formulation stage.

A Notification issued by the Ministry on 27th January 1994, makes EIA statutory for 29 specified activities falling under various sectors such as Industries, Mining, Irrigation, Power, Transport, Tourism etc,. This notification has been amended on 4th May 1994, and the amended version includes a self - explanatory note detailing the procedure for obtaining environmental clearance, technical information/documents to be submitted at the time of applying for environmental clearance, and cases which are likely to be exempted from obtaining environmental clearance from MOE&F, in order to facilitate the submission of complete applications for environmental appraisal. The Notification stipulates, *inter alia*, that all applications complete in every material respect, have to be examined and decision conveyed to the applicants within 30 days in site clearance and 120 days in respect of environmental clearance of projects.

Environmental Appraisal Procedure

Once an application has been submitted by a project authority along with all the requisite documents specified in the EIA Notification, it is first scrutinised by the technical staff of the Ministry before placing it before the Environmental Appraisal Committees. The Appraisal Committees evaluate the impact of the project based on the data furnished by the project authorities and if necessary, site visits or on-the-spot assessment or various environmental aspects are also undertaken. Based on such examination, the Committees make recommendations for approval or rejection of the project, which are then processed in the Ministry for approval or rejection.

In the case of certain site-specific projects, a two stage clearance procedure has been adopted, whereby the project authorities have to obtain a site clearance before applying for environmental clearance of their projects. The following projects are required to obtain site clearance as well as environmental clearance.

- Mining
- Pit-head thermal power stations

- Hydro-power, major irrigation projects and or their combination including flood control
- Ports and Harbour (excluding minor ports)
- Prospecting and exploration of major minerals in areas in excess of 500 hectares.

Appraisal Committees

Environmental Appraisal Committees (Expert Committees) have so far been constituted for the following sectors:-

- Mining projects
- Industrial Projects
- Thermal Power projects
- River Valley, Multipurpose Irrigation and Hydro-electric projects.
- Nuclear Power and related projects
- Transport, Tourism & Miscellaneous Projects

Monitoring

Environmental clearance of developmental projects is subject to implementation of stipulated safeguards. The cleared projects are monitored through the six Regional Offices of the Ministry located in different regions so as to cover the entire country. The procedure is as follows:

- Project authorities are required to report every six months on the progress of implementation of the conditions/safeguards stipulated, while according clearance to the project.
- Field visits of officers and expert terms from the Ministry and/or its Regional Offices are undertaken to collect and analyse performance data of development projects, so that difficulties encountered are discussed with the proponents with a view to finding solutions.
- In case of substantial deviations and poor or no response, the matter is taken up with the concerned State Government.
- Changes in scope of project are identified to check whether review of earlier decisions is called for or not.

Status of Appraisal of Projects

During the year, five hundred and ten (510) projects were received for environmental & site appraisal. Required information was also received in respect of most of the 89 projects pending at the beginning of the year. Four hundred and twenty nine projects were appraised/

Table - 5

Status of Development Projects (From 1.1.94 to 31.12.94)

Sl. No.	Development Sector	Projects Pending at the beginning of the year	Proejcts Received	Projects* Appraised	Projects Cleared	Projects Rejected	Additional Information Sought
1.	(a) Mining Projects	29	46	25	13	5	57
	(b) Mining Projects (Site Clearance)	Nil	320	217	24	210	86
2.	Industrial Projects	18	48	27	20	7	39
3.	Atomic Power Projects	Nil	1	1	Nil	Nil	1
4.	Thermal Power Projects	14	29	55	15	4	24
5.	River Valley Projects	4	31	47	8	16	11
6.	Other Sectors (including Transport, Ports, Tourism, Harbours, Airports, Highways, Communication Projects)	24	35	57	24	5	30
Total :		89	510	429	104	247	248

* Some of the Projects have been appraised more than once.

reappraised during the year, out of which one hundred and four projects were granted environmental and/or site clearance. Detailed break uo of the status of the environmental appraisal of various projects during the year is given in Table-5.

Mining Projects

During the year 46 projects were received for environmental appraisal. Required information was also received in respect of 29 projects pending at the beginning of the year. All projects were appraised out of which 13 projects were cleared and additional information has been sought for the other 57 projects. 66 projects cleared earlier were monitored during the year.

Fig. 37 An example of the adverse impacts of mining vegetation in Jharia coal field.

A total of 320 projects were received during the year for site clearnance, out of which 24 projects were cleared and 210 projects were rejected. Additional information has been sought for the remaining 86 projects.

Further, seven proposals including five mine-renewal cases, have been approved in the notified areas of Alwar and Gurgaon districts in consonance with the provisions of Aravalli Notification vide S.O. 319 (E) dated 27th May, 1992. The matter relating to the marble mines in the Sariska Tiger Reserve is still under the consideration of the Supreme Court of India.

Industrial Projects

During the year, 48 projects were received for environmental appraisal. Required information was also received in respect of 18 pending projects. After appraisal, 20 projects were granted environmental clearance and 7 projects were rejected. Additional information has been sought for the remaining 39 projects. While according environmental clearance necessary safeguards for pollution control, energy conservation, waste water re-cycling and adoption of clean technology etc were stipulated. 43 cleared projects were monitored during the year.

Nuclear Power and Related Projects

During the year only one project has been received.

Thermal Power Projects

During the year, 29 projects were received for appraisal and additional information was also received in respect of 14 pending projects. All projects were appraised/re-appraised, out of which 15 were cleared and 4 were rejected. Additional information has been sought for the remaining 24 projects. While according clearance, special emphasis has been laid on the utilisation of fly ash, re-cyling/re-use of effluents, conservation of water, use of clean technology, raising of green belt all around power plant, monitoring of air and water quality etc. 30 projects were monitored during the period.

River Valley Projects

During the year, 31 projects were received for environmental appraisal, and required information was received in respect of 4 pending projects. All projects were appraised/reappraised, out of which 8 were cleared and 16 were rejected. Additional information has been sought for the remaining 11 projects. Safeguards stipulated while according clearance focussed on catchment area treatment, command area development, rehabilitation, flora and fauna, health aspects etc. 95 projects were monitored during the year.

Other Sectors (including Transport, Tourism, Ports, Harbours, Airports, Highways and Communication Projects etc.)

During the year 35 projects were received for appraisal. Required information was also received in respect of 24 projects pending at the beginning of the year. All projects were appraised/re-appraised during the period, out of which 24 projects were cleared and 5 projects were rejected. Additional information has been sought for the remaining 30 projects. Monitoring of cleared projects was continued.

Coastal Area Management

The Coastal Regulation Zone (CRZ) notification of the Ministry issued on 20th February, 1991 regulates

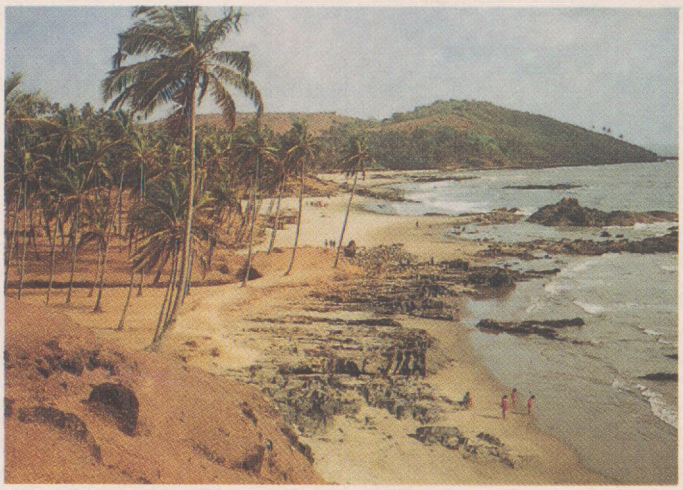


Fig. 38 Unplanned tourism, soil erosion and iron-ore pollution are major causes for coastal degradation

activities along the coastal areas of the country. As per the provisions of the CRZ notification, the coastal State Governments and Union Territory Administrations are required to prepare Coastal Zone Management Plans (CZMP) identifying and classifying the areas in their jurisdiction into different categories as per the guidelines given in the notification. Such plans are required to be approved and finalised by the Ministry, for which purpose a Task Force has been constituted by the Ministry. The approved Coastal Zone Management Plans would form a part of local statutes for enforcing the norms and provisions of the CRZ.

Review of establishment of norms for hotels in coastal areas

Based on the recommendations of the Expert Committee set-up under the Chairmanship of Shri B.B. Vohra, the CRZ notification of 1991 has been amended. The amended Notification containing certain modifications to the earlier CRZ Notification, has been issued on 16.8.1994.

Fig. 39 Palm fringed, sun-drenched unpolluted beaches of Goa-a major attraction for tourists

Development of Tourism in Andaman & Nicobar and Lakshadweep Islands

Subsequent to discussions held at various levels in the Ministry of Home Affairs and the Department of Tourism, the Ministry, while conveying its approval for opening up of more islands for tourism in Andaman & Nicobar Group of Islands, has emphasized that important environmental issues should be addressed and adequate mitigative measures enforced while taking up any activity in these areas.

In the case of Lakshadweep Island, the Ministry has strongly opposed the idea of letting up the entire Island for development of tourism, and has recommended that specific areas should be identified for development of beach resort/tourism facilities.

Fig. 40 Coastal pollution due to iron-ore

Island Development Authority (IDA)

The IDA functioning under the Chairmanship of the Prime Minister, is responsible for issuing guidelines which ensure that the natural resources of Andaman & Nicobar and Lakhadweep Islands are put to optimal and sustainable use without creating adverse environmental impacts.

The Authority will also decide on policies and programmes aimed at integrated development of the Islands, keeping in view all aspects of environmental protection as well as the special technical and scientific requirements of the Islands, and review progress of implementation and impact of the programmes of development.

Studies on Carrying Capacity

The Ministry of Environment and Forests has been sponsoring Carrying Capacity Studies in environmentally sensitive areas to identify actions to be taken in those areas on an urgent basis to conserve, protect and preserve the environment as well as to draw up sustainable development plans so that the over-all development of the area takes place in harmony with the environment and the resources of the region may be utilised optimally for the benefit of a large segment of the society.

Presently, four such studies are in progress, as summarised below :

Doon Valley-A Sensitive Ecosystem

This project covers an ecologically sensitive area of about 2000 sq. kms. The first and 2nd phase of the study, involving collection of secondary and primary data have been completed. Modelling exercises based on such data have also been completed as part of Phase-III. Suitable development patterns, taking into account ground realities, are being evolved and these are proposed to be discussed with the local people and planning agencies before finalising the report.

National Capital Region

The study area covers the National Capital Territory of Delhi and its adjoining areas in the States of U.P., Haryana and Rajasthan declared as National Capital Region. The first phase of the programme involving Secondary Data Collection is under-way and is expected to be completed by June, 1995. A draft interim report prepared on the basis of secondary data is proposed to be discussed with the NCR Planning Board.

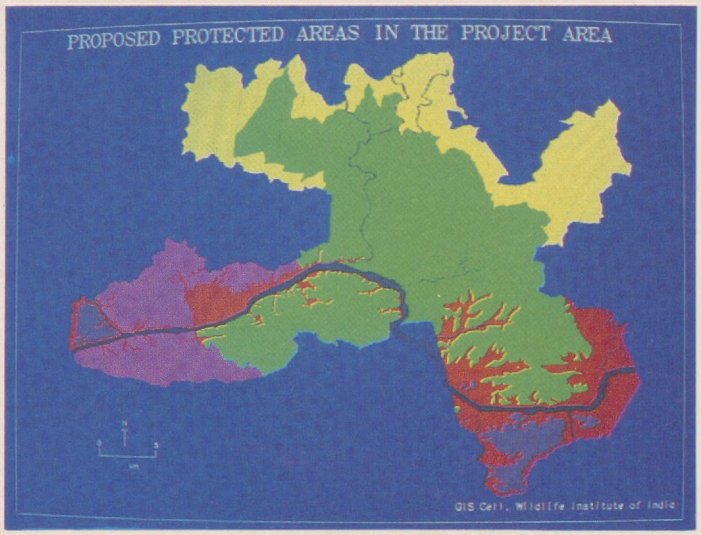


Fig. 41 Application of Computer Aided Design for EIA in the Narmada Sagar Project Area

Damodar River Basin

This study covers the entire Damodar Basin in the States of Bihar and West Bengal. The first phase of the study namely, Collection of Secondary Data (and Primary Data wherever secondary data is not available) for identifying the hot-spots has been completed. This is being evaluated and the second phase of the programme will be taken up in the year 1995, based on the evaluation.

Tapi Estuary

This study covers the area around Surat and its hinterland. The first phase of the programme is in progress and is likely to be completed by May, 1995.

Training Programmes and Workshops

A workshop on urban environment was held at the Human Settlement Management Institute during 19th to 24th September. 1994.

5

PREVENTION AND CONTROL OF POLLUTION

Introduction

The Policy Statement for Abatement of Pollution, adopted in 1992, lays emphasis on pollution prevention in place of the conventional end-of-the-pipe treatment, and also identifies adoption of best available and practicable technologies as the key element for pollution prevention. The focus of the various programmes of the Ministry and its associated organisations related to pollution prevention and abatement has therefore shifted from merely identifying changes in disposal techniques to issues such as promotion of clean and low waste technologies, improvement of water quality, formation of mass based standards, institutional and human resource development, natural resource accounting, environment audit etc. The whole issue of pollution prevention and abatement is dealt with by a combination of command and control methods as well as voluntary regulations, fiscal measures, promotion of awareness etc.

Environmental Statement (as part of Environmental Audit)

The Notification on Environmental Audit issued by the Ministry in 1992, makes it compulsory for all the industrial units seeking consent under the Air Act 1981, Water Act 1974 and authorisation under the Hazardous Waste (Management and Handling) Rules 1989, to submit an annual environmental statement to the concerned State Polution Control Boards (SPCBs). This is expected to promote not only smooth monitoring of the industrial activities but also adoption of low waste technology and minimisation of resource consumption by industrial units.

During the year, sector specific model environmental audit reports in respect of selected representative sectors from the heavily polluting categories have been prepared, to help the SPCBs in evaluating the environmental statements filed by the industrial units.

Training programmes on environmental audit and waste minimisation have been organised for personnel in Central and State Pollution Control Boards and industry representatives. Sector-wise environmental audit workshops are also being organised in selected sectors at various places in the country.

A software package ''Paryavaran'' has been prepared for analysis of information submitted in environmental statements and is being distributed to all the State Pollution Control Boards. This is expected to help in systematic analysis of the statement and useful

interpretations of the data contained in them. A user manual has also been prepared for the software package.

A report on the performance of environmental statements in selected State Pollution Control Boards has been prepared by the Central Pollution Control Board.

Environmental Statistics and Mapping

A Project "Environmental Statistics and Mapping" using Geographic Information system (GIS) and remote sensing with specific reference to abatement of pollution has been sponsored to the National Institute for Science, Technology and Development Studies (NISTADS), New Delhi. Under the project base thematic maps on 1:6M scale have been prepared and digitised. The maps include information on location of water and air quality monitoring stations, location of critically polluted areas, designated best use classification of streams, major cities above 1 lakhs population, administrative divisions-district boundaries, major river basins and drainage network. An interim report titled "GIS application in environmental pollution covering solid waste, atmospheric pollution, noise pollution and water pollution' has been prepared.

Development & Promotion of Cleaner Technologies

A scheme to set up Cleaner Technologies Promotion Network formulated and submitted to the World Bank last year, has been approved in August, 1994. The operational modalities of the Network have also been discussed with industry, research institutions and other user agencies, and the scheme is expected to become operational shortly.

Clean Technology for Small Scale Industries

Under the scheme on "Adoption of clean technologies in small scale industries" training and awareness programmes for personnel in Small Industry Development Organisation (SIDO) and for entrepreneurs by Small Industry Service Institute (SISIs) through Development Commissioner Small Scale Industries (DC:SSI) are being continued.

A manual "From Waste to Profits" giving guidelines for waste minimisation has been prepared. Sector specific manuals on pulp and paper, pesticide formulations and textiles-dyeing and printing are being finalised.

An interim report on waste minimisation and demonstration studies in electroplating units, located in Tamilnadu has been prepared by the National Productivity Council under a project sponsored by this Ministry. The scope of the report includes process optimisation, conservation of plating chemicals, water conservation and stream segregation and reuse of opportunities, material handling and operational improvements including utilities; preparation of waste minimisation mannual.

Waste Minimisation

Waste minimisation has emerged as one of the most sustainable approaches for simultaneous promotion of profit enhancement and environmental pollution prevention and abatement particularly in the small scale industry.

In order to make waste minimisation into a movement, the concept of Waste Minimisation Circles is being

Fig. 42 A view of a Decher Thickner area in a Pulp & Paper Industry before and after adoption of energy conservation and waste minimisation measures

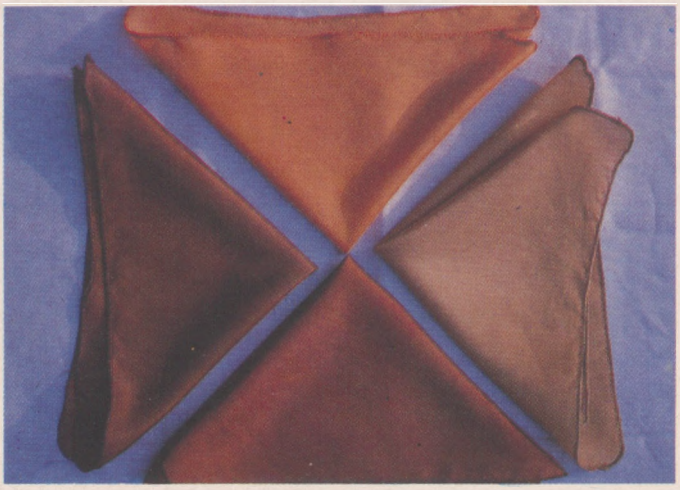


Fig. 43 Eco-friendly dyes developed from forest wastes at FRI, Deharadun

introduced. These circles would be an assembly of representatives of similar types of industries in a cluster working collectively to promote Waste Minimisation in their respective units as part of their overall business strategies. Fior institutionalising the Waste Minimisation Circles, a series of workshops for entrepreneurs of various industrial clusters of different categories are being held. This concept is also being extended to industrial areas where Common Effluent Treatment Plants (CETPS) already exist. To begin with 10 such Waste Minimisation Circles are being plannned. Two workshops one for tanneries at Vaniyambadi, and the other for Jeedimetla Effluent Treatment Co. Ltd. at Hyderabad were held during which the enterpreneurs have agreed to form Waste Minimisation Circles in their respective places.

Fiscal Measures

Fiscal measures play an important role in ensuring conformity to norms of pollution prevention and control. There are at present several fiscal incentives for installation of pollution control equipment. Steps have been taken to encourage the shift from curative to preventive measures, internalise the cost of pollution and to conserve resources. Fiscal incentives presently provided include the following:-

- Incentives in terms of rebate on water cess payable under the Water (Prevention & Control of Pollution) Cess Amendment Act, 1981.
- Depreciation allowance at 100% for installing pollution control devices.
- Custom duty at reduced rates of 35% plus 5% auxillary charges levied on equipment and spares for pollution control.
- Custom duty at the reduced rate of 25% and full exemption from additional duty for kits required for conversion of petrol driven vehicles to compressed natural gas driven vehicles.
- Excise duty at the rate of 5% on manufactured goods that are used for pollution control.
- Exemption under section 35 of CCB of the Income Tax Act to assessee who incur expenditure by way of payments on any sum to Association Institutions which carry out programmes of conservation of natural resources.

To encourage reuse and recycling of wastes, the following on-going fiscal concessions have been provided in the Central Budget stipulated for prospective entrepreneurs to set up manufacturing units of building materials and help in promoting environment friendly technology for the building material industry:

- Exemption of Excise Duty on the production of building materials using fly ash and phospho-gypsum in 25% of more quantities as raw materials.
- Exemption of Excise Duty on bricks and tiles manufactured used red mud, 25% or more as raw materials.
- Exemption of the Customs Duty on the import of equipment, machinery and capital goods required for the production of building materials using fly ash/ phospho-gypsum such as bricks, light weight aggregates and light weight concrete elements etc.
- Fly ash handling system.

There is also a provision for obtaining loans at reduced rates of interest from Financial Institutions for installing pollution control devices:-

- Assistance is provided to large and medium scale units to instal Effluent Treatment Plants aimed at waste minimisation, resource recovery and pollution abatement. A minimum promoter's contribution of 25% of the project cost is envisaged and 75% can be obtained as loans from IDBI/ICICI at the rate of interest of 15.5% per annum (including Interest Tax). It will be repayable by the units within a period not exceeding 15 years including a maximum grace period of 4 years.

- Financial assistance towards capital investment upto 50% or Rs. 1 crore whichever is less is given as subsidy to industrial estates of small scale industries for setting up Common Effluent Treatment Plants. The project has 25% of Central Government share and 25% State Government Share and the remaining amount may be raised from IDBI (30%) and promoter's contribution as 20%.
- Central Government assistance upto 40% or maximum of Rs. 1.5 crores is provided for setting up demonstration projects in the areas of waste minimisation, clean technologies and waste recycling.

Vehicular Pollution

A major decision regarding introduction of unleaded petrol in the four metropolitan cities of Delhi, Bombay, Madras and Calcutta, with effect from April 1, 1995 has been taken by the Ministry in consultation with officials of the Ministry of Petroleum and Natural Gas, Ministry of Surface Transport, Ministry of Industry, Oil Coordination Committee, Central Pollution Control Board, automobile manufacturers, representatives of the oil industry, and representatives from R&D institutes such as Indian Institute of Petroleum. Unleaded petrol would be sold, alongwith leaded petrol as at present, in selected retail outlets of these four metros, to cater to the requirements of four-wheeler petrol driven vehicles fitted with catalytic converters. Catalytic converters would also be sold in these four metro cities from 1st April 1995. Consequent to this meeting, the Supreme Court has also passed orders on 21.10.1994 endorsing this decision. Besides this, petrol with a maximum lead content of 0.15 g/l has been introduced at all the retail outlets of the four metro cities since June 1994.

Environmental Epidemiological Studies

Environmental Epidemiological Studies for the identified critically polluted areas in the country have been started in seven areas which include Vapi (Gujarat), Chembur (Maharashtra), Cochin (Kerala), Talcher (Orissa), Mandi-Govindgarh (Punjab), Bhadravati (Karanataka) and Kanpur (Uttar Pradesh).

Development of Standards

The effluent and emission standards for 11 categories of specific industries have been finalised for notification under the Environment (Protection) Act, 1986. These are: i) Starch industry (Maize Products), ii) Beehive hard coke oven, iii) Briquette Industry (Coal), iv) Soft Coke Industry, v) Edible oil & vanaspati industry, vi) Organic chemicals manufacturing industry, vii) Flour mills, viii) Boilers (small), ix) Pesticide industry, x) Oil drilling & gas extraction industry, and xi) Pharmaceutical industry.

The National Ambient Air Quality Standards have also been finalised for Notification under the Environment (Protection) Act, 1986.

A protocol for utilisation of post-methanated distillery effluents for irrigation of agricultural crops has been finalised.

Central Pollution Control Board

The Central Pollution Control Board (CPCB) is an autonomous body of the Ministry, set up in 1974 under the provisions of the Water (Prevention & Control of Pollution) Act, 1974. The CPCB co-ordinates the activities of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs). It also advises the Central Government on any matter concerning the prevention and control of air, water and noise pollution. The CPCB, SPCBs and the PCCs are responsible for implementing the legislations relating to prevention & control of pollution; they also develop rules and regulations which prescribe the standards for emissions and effluents of air & water pollutants and noise levels.

Details of some of the major activities of the CPCB during the year are given below:-

Assessment of Pollution by Survey

Vehicular Pollution Survey

During 1994, vehicular pollution surveys have been conducted in the cities of Indore, Bhopal, Lucknow, Ahmedabad, Aurangabd, Vishakhapatnam and Kochi. While vehicles were monitored with respect to carbon monoxide, hydro carbon and smoke, the ambient air quality was monitored for SPM, Lead, NO_x and SO_2 at major road crossings to assess the impact of vehicular pollution.

Noise Pollution Survey

Noise pollution surveys were conducted in the cities of Ahmedabad and Aurangabad. The sound pressure level was monitored at 36 points dividing the entire city into eight grids and identifying the points into residential, commercial, industrial and sensitive zones. Data compilation and detailed analysis are in progress.

Measurement of ambient noise levels at nine places in the city of Mangalore has revealed that at most of the

places, the levels of noise exceeded the prescribed limits and that vehicles are the major source of noise pollution.

Assessment of Pollution by Monitoring

Air Quality Monitoring

Out of 290 stations under the National Ambient Air Quality Monitoring (NAAM) Programme, 188 are in operation, 38 are being relocated and 26 stations have been withdrawn. Besides the meteorological parameters, air quality parameters such as SO_2, NO_2 and SPM are monitored. At a few location, Ammonia, Hydrogen Sulphide and Respirable SPM are also being monitored.

Water Quality Monitoring

Surface Water

The Inland Water Monitoring is being done under three major programmes:

- Monitoring of Indian National Aquatic Resources System (MINARS)
- Global Environmental Monitoring Systems (GEMS)
- Ganga Action Plan (GAP).

There are a total of 480 stations under these programmes out of which 398 stations are for rivers, 39 are for lakes, 27 for ground water sources and 16 stations are at miscellaneous locations.

Ground Water Monitoring

The Ground Water Quality project taken up during 93-94 for assessing the ground water quality of 21 out of 24 critically polluted areas of the country has been completed. A total of 34 parameters have been monitored at these 21 sites through a network of 134 sampling locations. The data collected is being interpreted with a view to preparing a comprehensive report.

Automatic Water Quality Monitoring of River Ganga

The Automatic Water Quality Monitoring Stations commissioned at five locations on the river Ganga, continued to monitor dissolved oxygen, conductivity and turbidity at one hour interval. The quality of river Ganga at Shuklaganj, Kanpur is presented in figures 44.

Automatic Water Quality Monitoring of River Yamuna

The quality of raw water supplied to water treatment plants in Delhi is being monitored through two Automatic Water Quality Monitoring Stations set up on the river Yamuna. Eight basic parameters are being monitored by these Stations.

A treatment study to examine the feasibility of treating drain effluent of the towns of Panipat and Faridabad of Haryana have been undertaken by the CPCB under the Yamuna Action Plan.

Control of Industrial Pollution along the River Ganga

The implementation of the provisions of the Water (Prevention and Control of Pollution) act 1974 in respect of the 68 industries identified along the river Ganga was continued during the year. The status of compliance in these 68 industries is as follows:-

Status	No. of Industries
1. ETP operating satisfactorily	30
2. ETP operating but not working satisfactorily	19
3. ETP under construction	02
4. No ETP at site	00
5. ETP not required	01
6. Industries closed	16
Total	68

Water Quality Atlas of India

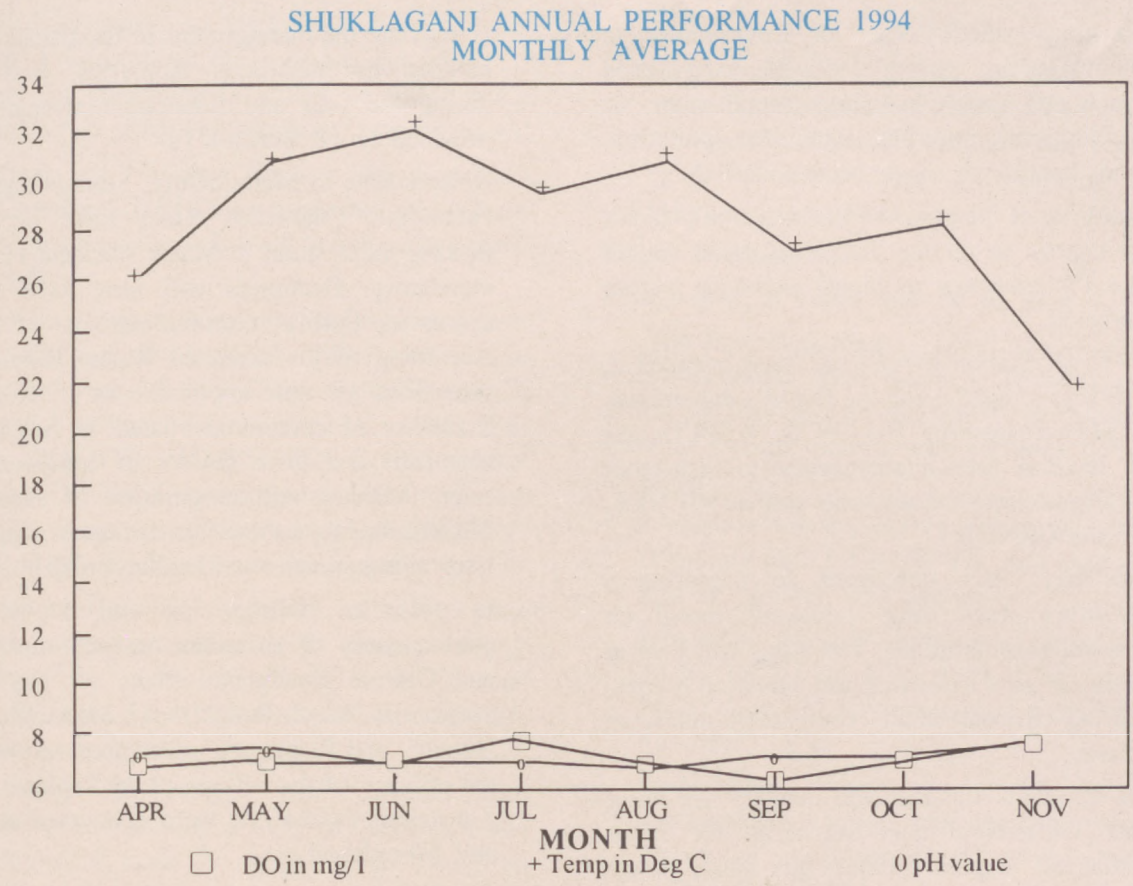
Based on the data provided by the CPCB, a water Quality Atlas of India has been prepared by the Survey of India. The Atlas contains 37 plates with relevant text and the individual basic maps include the following information:-

- Water quality monitoring stations and the water quality indices wherever possible.
- Polluted stretches of various rivers.
- Problem areas.
- Class I cities & Class II towns.
- Information pertaining to the 17 major categories of high polluting industries.

The atlas was released on 5th June 1994 by the Hon'ble Minister for Environment and Forests at New Delhi.

Other Activities

- The NGO Cell set up at the CPCB during 94-95 held three Interaction Meetings with NGOs at Vadodara, Sangli and Delhi. About 120 Water Testing Kits have been distributed to NGOs and Schools.



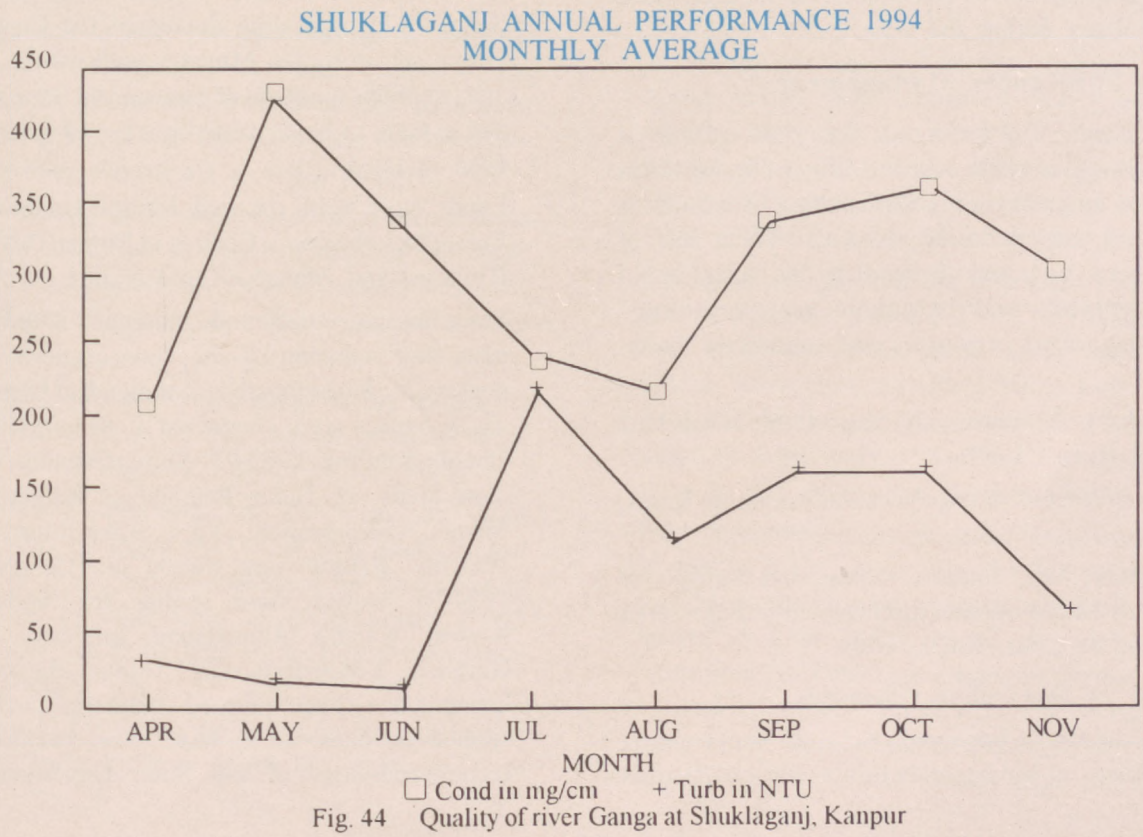


Fig. 44 Quality of river Ganga at Shuklaganj, Kanpur

- Under a study titled "State of Environment in Kanpur" taken up during 1993-94, information relating to water quality including ground water, air quality, industrial pollution, vehicular pollution, population, health etc. have been collected.
- The monitoring of the progress of the action plan for pollution control in all the 1,551 industries falling under the 17 categories of highly polluting sectors was continued.
- A Micro-Earth Station (MES) has been installed in the CPCB thus strengthening the Board's capabilities for data base management. The CPCB, 18 SPCBs and one PCC have all been interconnected to each other through various electronic networks such as NICNET, SIRNET and ERNET.
- Guidelines have been developed for preparing a 'Zoning Atlas' for siting industries based on environmental considerations. The Atlas will help in proper siting of new industries and industrial estates, thus ensuring environmentally compatable industrial development.
- Emission standards for pesticide industry are being developed. emission/effluent standards for Brick kilns, Soda ash, cupolo furnace, gas based power station, and explosives manufacturing industry have been finalised during the year.

Hazardous Substances Management

The Environment (Protection) Act, 1986, places on the Central Government the responsibility of laying down the procedures and safeguards for handling of hazardous substances and prevention of accidents. Three sets of rules have been prepared to regulate the handling of hazardous chemicals and hazardous micro-organisms/ genetically engineered organisms and hazardous waste. These are:

- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989.
- Hazardous Waste (Management and Handling) Rules, 1989.
- Manufacture, Use, Import, Export and Storage of Hazardous Micro-organisms/Genetically Engineered Organisms or Cells, Rules, 1989.

Management of Hazardous Chemicals

- The Centrally Sponsored Scheme for creating infrastructure in the State Pollution Control Boards to regulate the management of hazardous substances handled by hazardous industries, was continued during the year and financial assistance has been provided to 18 States/UTs.
- Amendments to Manufacture, Storage and Import of Hazardous Chemicals Rules have been notified, making safety audit in Major Accident Hazard Units mandatory. Occupiers will now have to get site approval before commencement of activities. According to the amended Rules, Isolated Storage provisions are now applicable to 25 chemicals and 2 classes of compounds listed in Schedule 2, 28 chemicals and three classes of compounds require safety auditing and preparation of safety reports. Time frames for submission of reports, approvals and issue of improvement notices have also been specified.
- In order to reduce risk and prevent off-site consequences of accidents on-site, hazard analysis and Off-site Emergency Plans for four industrial pockets in West Bengal viz. Midnapur, Howrah, Hooghly and Rishra are under preparation. To check the efficacy of the off-site plans finalised earlier for 8 districts, mock-drills were conducted at Durgapur and Moradabad.
- The Red Book entitled "Central Crisis Group Alert System" incorporating details of the Central Crisis Group set up by the Ministry with names, addresses and telephone numbers of Central and State authorities and experts to be contacted in case of emergency has been updated.
- Funds have been released for the establishment of Emergency Response Centres in Bhopal (MP), Baroda (Gujarat) and Manali (Tamil Nadu).
- For enhancing safety and emergency preparedness in units and reducing of-site consequences, industrial pocketwise hazard analysis studies had been initiated. These studies were conducted at Alwar, Chembur & Dhanbad during 1992-93. Similar studies for eleven more areas viz. Delhi, Patalganga, Raigarh, Mettur, Manali, Udyogmandal, Vapi, Ankleshwar, Howrah, Hooghly, Rishra were started in 1993-94. During 1994-95, eleven more studies for Ambalamugal, Kovvur, Kandla, Ahmedabad, Lucknow, Bilaspur, Gurgaon, Lote-parshuram, Taloja, Bangalore and Udaipur have been initiated. Industrial pockets to be studied in these areas have been decided on the recommendations of the State Governments. The

Scheme of assistance to Institutions for conducting Training Programmes for various categories of personnel for enhancing of safety, in industry and management of chemical accidents was continued.

- The scheme of National Register for Potentially Toxic Chemicals (NRPTC) was started in 1993 and since its inception the following activities have been carried out.
- The requisite infrastructure and hardware have been set up. Additional data bases viz. IRPTC-PC version ECDIN, data bases from ILO like CCINFO (on CD ROM) which includes RTECS, OSH Can Data/HST Canada, NIOSHTIC, MSDS/FTSS CHEM Source, OSH Inter Data/HST International, INTOX (empty version) have been obtained. A copy of CHEMTREC/ CHEMBANK of UK is also being obtained.
- A "Hands on Training" on IRPTC and a few other databases was organised at NIC during 14-17th February, 1994, in which officers from Regional Offices, Pollution Control Boards and various other Ministries participated.
- For building up linkages with various State Governments and Boards a node of NIC-NET has been obtained; a node for SIRNET has also been installed.
- An approach paper for establishing a National Inventory of Chemicals has been prepared and circulated to all concerned agencies for comments. A compendium of relevant databases and literature on Hazardous Chemicals is being prepared.
- H-Acid, J-Acid and seven other dye-intermediates have been identified as problem causing chemicals and a Status Report on these chemicals has been prepared and circulated to various organisations for comments.
- To facilitate information exchange in the country, it is proposed to replicate this register on zonal basis at each of the Regional Offices of the Ministry.
- The Ministry continued to be associated with consultations arranged by UNEP to provide a legal backing to the London Guidelines for Exchange of Information on chemicals in International Trade. Negotiations are being held to develop a convention on this subject.
- The proposal for setting up a Poison Control Centre at the All India Institute of Medical Sciences, New Delhi, has neen finalised.
- One research project entitled, "Pesticide contamination in the Nilgiris District with special reference to selected avifauna" has been sponsored to the Salim Ali Centre for Ornithology and Natural History, Coimbatore.

Crisis Management

Mangement of crisis due to oil slick

The Inter-departmental Co-ordination group on oil-slick, functioning under Secretary (E&F) coordinated the efforts of various Government Departments and State Pollution Control Boards with reference to the following accidents:

- Explosion in a ship carrying crude oil near Porbander (Gujarat) on 23.3.1994. The fire was extinguished and oil spillage was averted.
- Grounding of carrier "M.V. Sea Transporter" carrying about 1000 tonnes of residual oil near Singuerin beach, Goa. Oil lubricants were transferred from the grounded vessel.
- Immediate steps were taken to transfer the oil from a grounded oil barge, carrying approximately 1600 tonnes of oil under charter with ONGC, which grounded and tilted at the mouth of river Gauthami near Narsapur on the A.P. Coast.
- A merchant ship "M.V. Sagar" carrying approximately 300 tonnes of heavy oil-diesel oil reported aground and tilted off Tiruvattiyur near Madras Port. The oil was transferred and the State Pollution Control Board was directed to assist the local authorities in monitoring studies.
- Consequent to the collision between a Danish Tanker with a Japanese ship on 21/1/1993 resulting in oil spill which drifted to Indian waters near Andaman Islands, surveys of the affected area were completed. Extent of environmental damages have been assessed and sent to Ministry of Surface Transport to enable them to file claims for compensation.
- Inter-departmental coordination was also carried out to deal with the cisis caused by the spread of toxic gas due to the burning of waste materials by a scrap dealer in East Delhi during the early hours of November 13, 1994. Investigations carried out by the Central Pollution Control Board have revealed that toxic fumes were produced during the crude process of refining/recovery of metals from metallic scrap/

metallic powder by the scrap dealer.

- At a meeting on "Use of dispersants to combat oil slick" organised on 18.5.1994 under the Chairmanship of Secretary (E&F), it was decided that long term studies regarding effect of dispersants used to combat oil slick may be undertaken by N.I.O., Goa, in association with other organisations.
- A series of discussions were held with Director (Operations) Coast Guard for preparing a project proposal on "Optimising the Development of Environment Management and Protection Programmes in the Indian Ocean" for funding under Global Environment Facility (GEF).

Hazardous Waste Management

Financial assistance has been provided for eleven sites in nine States, viz, Andhra Pradesh, Bihar, Gujarat (2 sites), Haryana, Himachal Pradesh, Karnataka (2 sites), Madhya Pradesh, Rajasthan and Tamil Nadu in the year 1993-94 for identification, environmental impact assessment and design for the development of secured landfill for the disposal of hazardous wastes. In 1994-95 financial assistance has been provided for four sites in three States viz., Madhya Pradesh (2 sites), Punjab and Uttar Pradesh.

- Amendments to Hazardous Wastes (Management and Handling) Rules, 1989, have been finalised and are being processed for notification.
- The first phase of the R&D project on "Application of Clay Soils and Indigenously Available Synthetic Membranes for Lining Landfill for Hazardous Waste Disposal" has been completed by NEERI, Nagpur and the report has been discussed in detail to delineate the activities required to be covered under the Project.
- Rules for the Handling and Management of Bio-Medical Wastes prepared under the Environment (Protection) Act, 1986, have been finalised after incorporating the views of the concerned Departments and are being vetted for notification.
- Draft guidelines for Handling and Management of Bio-medical Wastes have also been prepared and shall be published after the Rules are notified.

Solid Waste Management

The National Waste Management Council held a meeting on 27.7.1994 during which the following points were emphasized:

- Utilisation of fly ash in Agriculture should be promoted.
- All efforts should be made to enhance the utilisation of fly ash from 3% to 50% by the turn of the century, as stipulated by the Department of Power.
- State Governments should be pursued to prepare perspective Action Plans for utilisation of fly ash at the earliest.
- Proper strategies should be evolved for the management of municipal solid waste in the country.
- Financial assistance has been provided for conducting a survey of Urban Municipal Solid Wastes covering various cities of the country, reports received from various Municipal Corporations were examined and suggestions made for revision.
- Central Road Research Institute, Delhi, has submitted an Interim Report for the pilot project on the use of Municipal Solid Waste in road construction.
- Various technologies are being promoted for Municipal Solid Waste management. Consequent to the plastic waste being brought in the restricted list as per the amended EXIM Policy, a Committee has been constituted by Department of Chemicals and Petrochemicals to formulate guidelines and to consider the issue of licencing of Plastic Wastes in which the Ministry of Environment and Forests is represented.

Implementation of the Public Liability Insurance Act (PLI Act), 1991.

A workshop was organised in October, 1994, at Chandigarh to increase awareness about the PLI Act and to discuss issues related to its implementation. Representatives of MoEF, Regulatory Agencies, Association and selected industries, participated in this workshop.

A draft scheme for the establishement of an Environment Relief Fund has been discussed with various agencies. Action has been initiated to organise four workshops in different zones of the country.

Hazardous Micro-organisms

The Genetic Engineering Approval Committee constituted by the Ministry held two Meetings during 1994-95.

Seven proposals involving hazardous micro-organisms and recombinant DNA products have been approved from the environmental angle.

6

REGENERATION AND DEVELOPMENT

Ganga Action Plan - Phase I (GAP-I)

The Central Ganga Authority established in 1985 under the Chairmanship of the Prime Minister, lays down the policies for works to be taken up under the Ganga Action Plan. The Authority is assisted by a Steering Committee and a Monitoring Committee. The Ganga Project Directorate, of the Ministry, services these Committees and coordinates the implementation of the schemes under the Ganga Action Plan.

During the year, the Monitoring Committee met once and the Steering Committee twice, to review the progress of the Ganga Action Plan, which was launched in 1986 for improving the quality of the river Ganga. The schemes under this plan are being implemented by various agencies of the respective State Governments of Uttar Pradesh, Bihar and West Bengal.

Schemes sanctioned and their progress

A total of 261 schemes were sanctioned under the Ganga Action Plan. These schemes can be broadly divided into six categories. The State-wise distribution of these schemes is given in Table-6.

Table - 6

Category	U.P.	Bihar	West Bengal	Total
Interception & Diversion Schemes	40	17	31	88
Sewage Treatment Plants (STPs)	13	7	15	35
Low Cost Sanitation (LCS)	14	7	22	43
Electric Crematoria	3	8	17	28
River front facilities	8	3	24	35
Other schemes for biological regeneration of the river etc.	28	3	1	32
Total	106	45	110	261

Out of these 261 schemes, 237 schemes have been completed so far. The remaining schemes are at various

stages of implementation. The State-wise break-up of the completed schemes is given in the Table-7.

Table - 7

Category	U.P.	Bihar	West Bengal	Total
Interception & Diversion Schemes	40	17	22	79
Sewage Treatment Plants (STPs)	9	3	10	22
Low Cost Sanitation (LCS)	14	7	22	43
Electric Crematoria	3	8	15	26
River front facilities	8	3	24	35
Other schemes for biological regeneration of the river etc.	28	3	1	32
Total	102	41	94	237

Amongst the schemes completed during the year, significant ones are the 80 mld sewage treatment plant with bio-gas power generation facilities at Dinapur, Varanasi and the 14 mld UASB plant at Mirzapur under the Indo-Dutch Programme. The UASB Plant at Jajmau Tannery waste water of 36 mld capacity has also been commissioned satisfactorily and its post-treatment works are expected to be completed by March, 1996.

Fig. 45 An electric crematorium at Bhagalpur built under the GAP Phase-I

Automatic Water Quality Monitoring Station of River Ganga (AWQMS)

Nine locations have been identified along the stretches of the river Ganga from Kannouj to Calcutta for installing Automatic Water Quality Monitoring Stations to monitor the quality of the river water continuously. Six stations, one in Kannouj, two in Kanpur, one in Patna, one in Varanasi and one in Allahabad have been installed so far and made operational.

Industrial Pollution Control along the River Ganga

The implementation of the provisions of the pollution Control Acts in respect of 68 industries identified along the river Ganga was continued during the year. The State-wise status of pollution control in these 68 polluting industries is given in Table-8.

Fig. 46 A Sewage Treatment Plant at Hardwar, set up under the Ganga Action Plan, Phase-I

Table - 8

Status	No. of Industries			
	U.P.	Bihar	West Bengal	Total
ETP installed	25	4	20	49
ETP under installation	--	--	2	2
Unit closed/ lock-out	9	1	6	16
ETP not required due to change in process	--	--	1	1
Total	34	5	29	68

Fig. 47 A Sewage Treatment Plant at Garden Reach, Calcutta, set up under GAP, Phase-I

Impact of the Ganga Action Scheme

Against the target set under Phase I of the GAP to create infrastructure capable of intercepting and diverting 873 mld of domestic sewage and capacity to treat 873 mld of domestic sewage, infrastructure capable of intercepting and diverting 628 mld and treating 431 mld of municipal sewage has been created. Besides this, completion of most of the low cost sanitation schemes and electric crematoria, has helped in reducing the pollution load of the river Ganga.

The efficacy of the GAP schemes with respect to people's health, is being evaluated and results available so far indicate that there is a decreasing trend in the incidences of water-borne diseases such as diarrhoea, helminthic infection, skin diseases, respiratory tract infection etc.

Public Participation

Initiatives have been taken to enlist people's participation in cleaning and maintaining the purity of the river Ganga through public awareness and education programmes involving non-governmental organisations, youth, pilgrims and school students.

Supreme Court direction to industries for setting-up Effluent Treatment Plants

In a Public Interest Litigation (Civil) No. 3727 of 1985-M.C. Mehta versus Union of India and others, the Hon'ble Supreme Court has directed that industries must set-up effluent treatment plants to the satisfaction of the concerned State Pollution Control Boards. The case is being heard every week and the cases of individual industries, are being reviewed regularly. Industries have already started taking concrete steps for setting up the effluent treatment plants conforming to prescribed standards.

Ganga Action Plan-Phase II (GAP-II)

Unlike GAP Phase I which is fully funded by the Central Government, the Second Phase of the GAP is a Centrally Sponsored Scheme with equal contribution from the Centre and the State Governments concerned. The Government has approved a Scheme of Pollution Abatement of Yamuna and Gomti rivers at an estimated cost of Rs. 421 crores. The estimated cost of Yamuna component is Rs. 357 crores for which external assistance from the Government of Japan is available. Pollution abatement works are to be taken up in 15 towns, of which

8 are in Uttar Pradesh and 6 are in Haryana, besides Delhi. The estimated cost of the Gomti component is Rs. 64 crores and pollution abatement works are to be taken up in 3 towns namely Lucknow, Sultanpur and Jaunpur. The implementation period of both Yamuna and Gomti Action Plans is about 6 years.

To formulate an Action Plan for Pollution Abatement of the river Damodar, surveys and studies have been initiated to collect data. The Second Phase of GAP would also cover the following works;

- Works required but not included in the First Phase of GAP in 25 Class I towns;
- Pollution abatement works in Class II and Class III towns identified on the main river Ganga.

Yamuna Action Plan

Under GAP Phase-II all Project Feasibility Reports for Yamuna Action Plan in UP towns namely; Saranpur, Muzaffarnagar, Ghaziabad, NOIDA, Vrindaban, Mathura, Agra and Ettawa have been approved.

Gomti Action Plan

Under Gomti Action Plan, preliminary surveys such as CCTV survey and sewer cleaning works have been taken up in Lucknow with expert inputs from Thames Water Authority under ODA assistance. Low Cost Sanitation Schemes and electric crematoria have been sanctioned for Sultanpur and Jaunpur. External assistance from ODA, Government of U.K. for the Gomti Action Plan is under active consideration.

National River Action Plan (NRAP)

An Approach Paper on the National River Action Plan (NRAP), has been approved by the Government at an estimated outlay of Rs. 1,000 crores spread over a period of 10 years as which the share of the Central Government would be about Rs. 500 crores. The NRAP will include grossly polluted stretches of those rivers of the country, not covered under the Ganga Action Plan Phase I and II. For this purpose, 14 grossly polluted stretches in 9 rivers and 14 less polluted stretches in another 8 rivers of the country have been identified and are under consideration for inclusion under the National River Action Plan. The stretches have been classified based on pollution load surveys carried out by the Central Pollution Control Board. Some more stretches in these or other rivers may also be taken up, if required. Proposals from the State Governments of Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan and Tamil Nadu have been received. The estimated cost of works in 46 towns on identified polluted stretches of 18 rivers in 10 States works out to be about Rs. 772 crores. Necessary action has been initiated to obtain approval of the Cabinet Committee of Economic Affairs (CCEA) to implement the NRAP. The NRAP is proposed to be renamed as the National River Conservation Plan (NRCP).

National Afforestation & Eco-Development Board (NAEB)

The National Afforestation and Eco-Development Board (NAEB), set up in August, 1992, is responsible for promoting afforestation, tree-planting, ecological restoration and eco-development activities in the country.

The objectives and functions of NAEB are as follows;

- To evolve strategies for ecological restoration of degraded forest areas and adjoining lands.
- To restore forest cover through natural regeneration or other appropriate interventions in the country for ecological security and promote efforts to meet fuelwood, fodder and other needs of the rural communities.
- To sponsor research and promote extension of such research findings to disseminate new technologies for regeneration and development of degraded forest and adjoining lands.

Fig. 48 A Maldhari tribal from Gujarat-their traditional wisdom needs to be documented and utilised

Fig. 49 Involvement of local women in nursery raising-a key factor for the success of afforestation schemes

- To create awareness about ecological and environmental issues and help foster people's movement for promoting afforestation and eco-development with the assistance of voluntary agencies, NGOs, and other institutions to promote participatory and sustainable management of degraded forests and adjoining lands.
- To coordinate and monitor the Action Plans for afforestation, tree planting, ecological restoration and eco-development.
- To undertake other measures necessary for promoting afforestation, tree planting, ecological restoration and eco-development activities in the country.

Afforestation under the 20 Point Programme

From the year 1990-91, the targets under 20 Point in two mutually exclusive items viz. 'seedling distribution' for planting on private land and 'area coverage' in respect of public lands, including forest lands. The targets and achievements for the year 1993-94 and 1994-95 are given in Table - 9.

Table - 9

	1993-94		1994-95	
	Target	Achievement		
i) Area coverage (Public lands including forests lands). (area in lakh ha.)	11.65	9.63	12.40	5.49
ii) Seedling distribution (for planting on private lands) (Seedlings in crores,	135.09	110.97	141.40	40.17
	(Upto 30/11/94)			

Schemes

Various schemes under the NAEB are as follows :

- Integrated Afforestaion and Eco-Development Projects Scheme (IAEPS)
- Fuelwood and Foder Projects Scheme (FFPS)
- Raising of Minor Forest Produce including medicinal plants (MFP)
- Grants-in-aid
- Seed Development
- Aerial seeding
- External aided projects
- Communication

Intergrated Afforestation and Eco-Development Projects Scheme (IAEPS)

Under implementation since 1989-90, this scheme promotes afforestation and development of degraded forests and adjoining lands through an intergrated approach to the management of these areas on a watershed basis. The specific objectives of this scheme are to:

- augment the avilability of biomass, fuelwood and fodder,
- generate employment and
- extend and disseminate proven technologies, fulfilling the larger objectives of sustainability, equity and environmental conservation with the participation of the local people.

Fig. 50 Involvement of school students in afforestation activities

Fuel Fodder Projects Scheme (50% Centrally Sponsored)

This scheme is meant to augment production and availability of fuelwood and fodder in identified fuelwood-deficient districts of the country. So far 196 districts have been identified as fuelwood-deficient.

Scheme for raising Minor Forest Produce including Medicinal Plants

The main objective of this scheme is to survey, conserve as well as increase production on non-timber forest proudce including medicinal plants with a view to improve and replenish the stock of indigenous minor forest produce and perennial medicinal plants which are fast depleting due to over exploitation. The Scheme also aims at providing income to the tribals and rural poor living in and around forest areas.

Scheme of Aerial Seeding

This scheme is intended to promote the regeneration of difficult and inaccessible areas like mountains/hills, ravines, deserts, etc. through aerial seeding.

Seed Development Scheme

Under this scheme, the State Governments are assisted to develop facilities for collection, testing, certification, storage and distribution of quality seeds of known origin. The objective is to have quality seeds to ensure healthy and better quality trees.

Grants-in-Aid Scheme

In tune with its philosophy of people's participation, NAEB provides grants-in-aid to Non-Government Organisations (NGOs) and Voluntary Agencies (VAS) for afforestation and wastelands development activities.

Regional Centres

NAEB has seven Regional Centres located at diferent universities and national level institutions, namely, University of Horticulture and Forestry Sciences, Solan (H.P.), University of Agricultural Sciences, Bangalore, Indian Institute of Management, Ahmedabad, Indian Institute of Forest Management, Bhopal, Agricultural Finance Corporation, Bombay/New Delhi, Jadavpur University, Calcutta; North-Eastern Hill University, Shillong. The Regional Centres help NAEB in promoting extension of replicable technologies and dissemination of results of research. They provide technical and extension support to the State Forest Departments in preparing projects for regeneration of degraded forests and adjoining lands with people's participation and act as a forum for exchange of ideas and experiences amongst the States in the region and across the regions. These Centres also carry out problem-specific studies, evaluate NAEB's programmes in the field and organise tranining programmes and workshops.

Eco-Task Forces

Eco-task Forces, consisting of ex-servicemen commanded by serving JCOs and Commissioned Officers, as joint venture of the Ministry of Environment and Forests, Ministry of Defence and the concerned State Governments to undertake ecological restoration works in selected environmentally degraded areas particularly in unapproachable and inhospitable terrains. Foreset Departments of the State Governments, in which the sites are located, provide technical support to the forces. The activities include afforestation, pasture development, soil and water conservation and other restorative works. These Task Forces are currently deployed in the States of Uttar Pradesh, Rajasthan and Jammu and Kashmir.

Technology Extension

The technology extension programme has been initiated to harness and extend technology inputs for eco-development and regeneration of degraded forests. A number of demonstration projects covering usar lands, arid and dry areas, gullied and ravinous lands, marshy and water-logged areas have been launched with the assistance of various scientific and technical institutions/departments, Universities and voluntary agencies. Central assistance is also being provided to the State Governments for conducting field trials of Tissue Culture raised seedlings in collaboration with the Department of Bio-Technology. Proven technologies are documented and disseminated to field level functionaries.

Inter-Departmental Coordination

An Expert Group has been constituted to consider the various issues of Joint Forestry Management, and the NAEB is engaged in formulating an integrated grazing policy in coordination with the Department of Animal Husbandry.

Approval of the Planning Commisssion has been sought for the Indira Kunj Scheme and the scheme of city forests in urban areas.

Fig. 51 Collection of fodder by village folk

National Fund for Afforestation

The National Fund for Afforestation and Wastelands Development, set up earlier, has been re-designated as the National Fund for Afforestation and Eco-development. Donations from individuals as well as corporate/non-corporate bodies to regenerate degraded areas/wastelands are eligible for 100% tax deduction under the relevant provisions of the Income Tax Act. The Fund is managed by a Committee headed by the Minister for Environment and Forests.

Mapping of Wastelands

The National Wastelands Identification Project (NWIP) was initiated in 1986 in collaboration with the National Remote Sensing Agency and the Survey of India to prepare district-wise wastelands maps on 1:50,000 scale by using satellite data.

Durint 1993-94, processing of satellite data, ground-truth verification and preparation of master copies of the maps for 84 districts was completed. The master sheets are under scrutiny in the Ministry of Defence for according security clearance before the maps are printed for distribution. Preparation of wastelands maps for nine more districts of Madhya Pradesh is also underway.

Monitoring and Evaluation

Besides the regular monitoring undertaken by the State governments, progress of tree plantation/afforestation activities was also monitored at the Central Government level through various independent agencies like the Indian Institute of Public Opinion (IIPO), National Council of Applied Economic Research (NCAER), Institute for Research, Management and Economic Development, Agricultural Finance Corporation (AFC), and Non-Government Organisations like PRADAN, as well as by individual forestry experts. Survival rate studies have also been entrusted to the Regional Centres.

The detailed district/taluk-wise information in respect of afforestation/tree planting activities are being compiled on random samples basis and computerised. These reports will be placed in the libraries of the Parliament and the Ministry of Environment and Forests so that such information is accessible to the people's representatives and to the general public. Sample checking in respect of the actual work done during the year 1993-94 in selected districts is being done through independent agencies and individuals like educational institutions, retired forest officers, NGOs etc.

New Initiatives

Joint Forest Management

Relising the need to evolve new strategies for wider involvement of stake holders in the management of natural resources and care of the environment, an Expert Committee has been constituted to facilitate people's participation in Joint Forest Management. so far 14 State/ Union Territories have adopted this system of management in which about 1.5 million hectares of land is being managed through 10,000 Village Protection Committees.

7

RESEARCH

Environmental Research

The Environmental Research programme aims at developing strategies, technologies and methodologies for better environment management. It also seeks to develop infrastructure and trained manpower for undertaking environmental research in the country. The programme particularly aims at attempting solutions to the practical problems of resource management and provides necessary inputs for development and formulation of Action Plans for conservation of natural resources and restoration of enviromental quality.

Research projects are funded in multi-disciplinary aspects of environment protection, conservation and management at various universities, research and development institutions and reputed non-governmental organisations of the country. These are supported under three main schemes namely:

- Man and the Biosphere (MAB) Programme :
- Environment Research Programme (ERP); and
- Action-oriented Research Programme for Eastern & Western Ghats.

The MAB Programme is an interdisciplinary programme of research which emphasizes ecological approach to the study of inter-relationship between man and the environment, and seeks to generate scientific knowledge needed to manage the natural resources wisely. The ERP covers chemical, bio-chemical, engineering, technology development and environment management studies. The Action-oriented Research programme addresses itself to location-specific problems of resources management in the Eastern and Western Ghat regions of the country.

During the year, 91 new projects were sanctioned, 18 projects were completed and 200 projects including the new projects were serviced. Annual workshops were organised to monitor the progress of the research projects. List of projects sanctioned and completed during the year are given in Annexure II and III respectively.

Highlight of some of the completed projects

- In a project on 'Behavioural ecology and measures for conservation of bats', the habitats and breeding behaviour of the flying mammals have been studied in detail. Field ethological and laboratory studies have yield results which emphasize and need to conserve the bats.

-- The project studying the effect of water pollution and dams on fish and fisheries of Punjab has generated useful information on the water quality, effects of industrial effluents on different life-history stages of commercially important fish species and also the pollution status of river Sutlej, an important fishery resources of the State.

-- A project on side effects of pesticides on VA/ Mycorrhizal model system has revealed that many of the commonly used pesticides have impacts on normal plant growth and development. Mycorrhizal endophytes are reported to significantly suppress potential soil borne pathogens causing root-rot disease in mungbean.

Co-ordinated Research Project on Ethnobiology

It is an integrated inter-disciplinary and multi-institutional project to study, evaluate and analyse multi-dimensional aspects of tribal life, culture, tradition and to understand the use of various plant and animal materials for medication, family planning, food and shelter by the aboriginals. The objective is to document the wisdom of the traditional knowledge system relating to conservation and use of natural resources.

The project is in its 2nd phase and ethnobiological data is being collected from the States of Maharashtra, West Bengal, Dadra & Nagar Haveli, Karnataka, Rajasthan, Gujarat,Tripura, Assam, Sikkim and Daman & Diu. The studies are being conducted by Nagpur University, Nagpur; Botanical Survey of India through its circles (regional centres), and the project is being coordinated by the Tropical Botanical Garden and Research Institute, Palode, Trivandrum.

During the year, a document entitled, ''Ethnobiology in India--A Status Report (1994)'' has been published, which presents an overview of the work accomplished in Phase I and Phase II. The salient features include:

-- Over 9500 wild plant species used by tribals for various purposes have been recorded.

-- Nine hundred and fifty wild plant species are reported to be new claims for medicinal purposes.

-- Out of 300 wild species used by tribals as piscicides and pesticides, at least 175 show promise for being developed as safe biopesticide.

-- Several endangered and threatened plant species have been documented.

-- About 250 samples of rare and primitive cultivars of cereals, millets, pseudocereals, pulses and vegetables have been deposited in the National Bureau of Plant Genetic Resources(NBPGR), New Delhi.

Fig. 52 The multi-coloured Himalayan barbet-an attractive bird

Co-ordinated Research Project on Conservation of Endangered Plant Species

This programme was started in 1985 in order to evolve approriate conservation strategies through understanding of basic biology of the species; and to develop protocols for the micropropagation/mass multiplication of the species by *in vitro* methods of some identified endangered/ threatened medicinal plant species.

The results of studies conducted at nine centres in the country are summarised below:

-- Basic biology of seven species *(Coptis teeta, Podophyllum hexandrum Valeriana Wallichii, Aconitum spp., Picrorhiza kurrooa and Nardostachys jatamansi)* was successfully investigated.

-- Phytochemical investigations on the medical plants covered under the programme revealed that the Indian species *(Coptis teeta, Podophyllum hexandrum,* etc.) have higher quantities of active principles than their related Japnanese and American species. Protocols

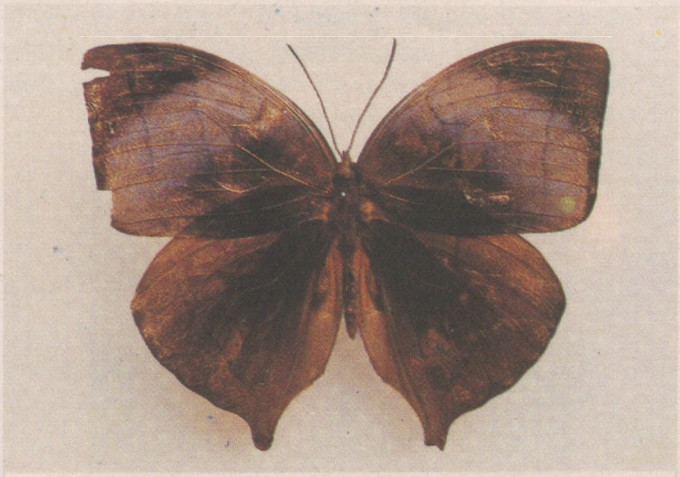


Fig. 53 Koh-I-Noor *(Amathusidia amythaon* Doubleday)-A butterfly of Tropical Forests of India

have been successfully developed for the micro-propagation of various endangered species viz. *Podophyllum hexandrum, Saussurea lappa, Picrorhiza kurrooa, valeriana wallichii, Nardostachys jatamansi, Aconitum heterophyllum* (all medicinal plants) and *Delphinium malabraricum, Nepenthes khasiana, Vanilla walkeriae, Paphiopedilum insigne* and *Dendrobium wardianum*

-- Growth and nitrogen fixation of some leguminous plant species for reclamation of iron and chromite mines were studied at Daitary and Kaliyapani (Sukhinda)respectively in Orissa. Among the tree legumes, *Leuceana leucocephala* and *Acacia nilotica* were found to the most suitable for iron as well as chromite mine soils. Among the crop legumes, *Vigna unguiculata* was found to be the best suited for iron and chromite mine waste soils. The growth of these plants was considerably improved with the use of nitrogen fixing microbe organisms such as rhizobium and VAM fungi. It was also noted that rhizobia were found to be more sensitive to chromite mine soil than iron soil and that chromite mine waste soil were found to be more hostile to the plant growth than the iron mine waste soil.

-- A Status Report on Impact of Mining on Environment in Goa has been prepared. The report includes necessary actions for scientific and environmentally safe mining operations and for regeneration of mine affected areas.

Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) ratified by India in November, 1993, and in force from March 21, 1994, aims at stabilisation of green house gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. It further seeks to achieve such a level within the time frame sufficient to allow ecosystems to adapt naturally to Climate Change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

During the year two metings of the Inter-governmental Negotiating Committee (INC) for UNFCC were organised by the INC Secretariat in Geneva.Various issues relating to commitments, adequacy of commitments, first review of information by Annex I Countries, Criteria for Joint Implementation, Financial Mechanism, Rules of Procedure, Role of Subsidiary bodies established by the Convention, etc. were discussed at these meetings. India participated in both the meetings.

Inter-governmental Panel on Climate Change (IPCC)

The Inter-governmental Panel on Climate Change (IPCC) is a scientific body supported by the World Meteorogical organisation and United Nations Environment Programme. It has established threeWorking Groups viz. Working Group I on Science of Climate Change; Working Group II on Mitigation and Adaptation and Working Group III on Cross cutting social issues. The Working Group II has four sub groups and India is Co-Chairman for Subgroup (a) dealing with Energy and Transport. The Working Groups are preparing their reports for the Second Assessment Report (1995) to be brought out by IPCC. India participated in the various meetings of the IPCC.

National Methane Campaign

Methane Campaign Phase-II complements the 1991 Methane Campaign (MC91) and covers repeat measurements to establish the reliability of the data, new data from gap areas, emission studies from wetlands and training course for methane emission measurements in Asian Countries and "1994 Indian Methane Campaign" The main organisations involved in this work are National Physical Laboratory (NPL). New Delhi; Regional Research Laboratory,Bhubaneswar (RRLB), Orissa; Institute of

Radio Physics & Electronics (IRPE) Calcutta, W.B: Regional Research Laboratory, Trivandrum (RRLT), Kerala: Gujarat University, Ahmedabad (GUA), Gujarat;Anna University. Madras (AUM) Tamil Nadu: Centre for Earth Science Studies (CESS) Trivandrum, Kerala; and Central Salt and Marine Chemical Research Institute (CSMCRI). Bhavnagar, Gujarat.

Repeat and additional measurements of methane emission from irrigated (intermittently flooded) and waterlogged (flooded) paddy fields (gap area) of Gujarat have further confirmed the reliability and validty of methane budget estimate of 3 to 6 Tg y^{-1} from Indian paddy fields. As a consequence of measurements made under National Methane Campaign, the Intergovernmental Panel on Climate Change (IPCC) has revised the methane budget estimate for global paddy fields from 110 Tg $y^{-1}$with range 25-170 Tg y^{-1} in 1990 to < 60 Tg y^{-1} with range 20-100 Tg y^{-1} in 1994 (Greenhouse Gas Inventory Reference Manual IPCC Draft guidelines Vol.3 pp.4.53). Paddy fields are thus no longer considered as the most significant major anthropogenic source of methane. Studies of methane emission from wetlands conducted at Chilka (Orissa), Bhaleswa and Shahabad Daulatpur (Delhi) and Akkulam lake (Kerala) indicate a very large variation from almost 0 to 400 mg m^{-1} h^{-1}. More comprehensive investigations of the methane emission from Chilka and other major wetlands of India are essential to identify and understand the parameters responsible for high, medium and low methane fluxes and to be able to derive a reliable methane budget estimate for Indian wetlands.

G.B. Pant Institute of Himalayan Environment & Development

The Institute was established in August, 1988 as an autonomous organisation of the Ministry for developing strategies, technologies and knowledge for ecologically sound development of the Himalayan region. Highlights of the activities of the Institute during the year are given below:

-- An agroforestry model has been developed in selected watersheds of Sikkim and Garhwal, to check soil erosion from farm fields, maintain soil fertility, increase crop productivity, promote cash fruit and fodder crops, and harvest rain water for the lean period.

-- For effective conservation of potable water, a community tap system has been developed.

-- An innovative micro-hydel technology has been developed with people's participation and tested in a remote village, Pai in Pranmati watershed.

-- Impact of domestic sewage disposal on natural water springs of Almora town has been studied and a number of recommendations for wastewater and sewage transportation have been made to the town authorities.

-- Large scale propagation methods of location-specific elite plants using conventional and biotechnological tools have been developed for some medicinal plants.

-- Under integrated Eco-development programme, 15 new projects have been processed for funding in addition to newly sanctioned projects. 14 projects sanctioned earlier were serviced. Two workshop were organised for project evaluation and monitoring.

-- Badrivan resotration programme has been initiated through the involvement of pilgrims, saints, army personnel, NGOs, school children and local people. A large number of seedlings have been raised at different locations in Garhwal Himalaya.

-- A regional training seminar on Conservation and Management of Biological Resources in the Himalaya (sponsored by UNESCO), a Workshop on the Role of NGOs' in Environmentally Sound Development of the Himalaya and a Regional Meeting of NGOs from north-east were organised.

-- The Institute has signed a MOU with the School of Forestry and Environmental Studies, Yale University New Haven, USA for research and information exchange concerning rural resources.

Research on Wetlands, Mangroves and Biosphere Reserves

Wetlands and Mangroves

A Research Sub-Committee of the National Committee on Conservation of Wetlands, Mangroves and Coral Reefs, scrutinises research proposals related to Wetlands, Mangroves and Corals. During the year the Research Sub-Committee has recommended four research projects on Wetlands and one on Mangroves for financial assistance. The list of the same is at Annexure-II.

Biosphere Reserves

A Scientific Advisory Committee (SAC) has been constituted to oversee the research activities under the

Fig. 54 The mangroves of Pichavaram-a source of livelihood for the people around

Biosphere Reserves Programme. During the year SAC met two times and as per its recommendations 13 research projects have been sanctioned by the Ministry. The list of these research projects alongwith implementing institutions is given at Annexure-II.

Forestry Research

Indian Council of Forestry Research and Education (ICFRE), Dehradun

The ICFRE an autonomous organisation of the Ministry of Environment and Forests holds the mandate to organize, direct and manage research and education in the field of forestry. It is also responsible for framing the overall forestry research policy of the country and ensure the best method of application of all sources of scientific knowledge to the solutions of problems facing the forestry sector. It is also responsible for propagating the results of the research through mass media, audiovisual aids, and extension machinery. Various research institutes and centres under the Council are as follows:--

- Forest Research Institute (FRI), Dehradun.
- Tropical Forest Research Institute (TFRI), Jabalpur.
- Arid Forest Research Institute (AFRI), Jodhpur.
- Temperate Forest Research Institute (TFRI), Simla.
- Institute of Forest Productivity (IFP), Ranchi.
- Institute of Wood Science and Technology (IWST), Bangalore.
- Institute of Forest Genetics & Tree Breeding (IFGTB), Coimbatore.
- Institute of Rain and Moist Deciduous Forests (IRMDF), Jorhat.

-- Advance Centre for Social Forestry and Environment (ACSFE), Allahabad.

All the Institutes of the ICFRE continued to carry out research activities relevant to the eco-climatic zones in which they are located. Some of the major research activities undertaken and research findings made during the year by the Council and its Institutes are as follows:--

-- It has been observed that mortality of Teak is more severe in those areas where compaction of soil due to cattle grazing, increased surface run-off and reduced moisture recharge has taken place.

-- Silvicultural operations such as cleaning, thinning, canopy opening, controlled burning, etc. have been suggested in non-observance of silvicultural operations areas for revitalizing the regeneration process in the natural forests.

-- Technology for the stablization of sand dunes has been evolved by Arid Forest Research Institute (AFRI), Jodhpur. The technique comprises of mulching dunes with shrubs of species *Crotalaria burhia* and *Aerva pseudotomentosa* and *Leptadonia pyrotechnica* on windward side perpendicular to wind direction at 5 m spacing. Along these mulching lines the micro wind breaks are raised by sowing grass seeds. After mulching operation suitable tree species are planted.

-- ACSFE Allahabad and AFRI Jodhpur have conducted successful research trials on rejuvenating saline sodic soils which include investigating critical limits of salt tolerance to identify stress tolerant species--provenances, soil amelioration, optimal planting season, application of micorrhizae and in leguminous trees rhizobium.

-- FRI, Dehradun has developed a package of practices for successful eco-restoration of phosphate mined lands. The integrated technology involves construction of mechanical structures to check water run off and erosion alongwith vegetative reinforcement through plantations. The species used are *Dalbergia sissoo, Acacia catechu, Salix tetrasperma, Trema politoria, Agave sislana, Rumex hastatus, Crotalaria sericea, Saccharumm spontaneum*, etc.

-- Studies on suitability and growth performance of multipurpose trees (MPTs) in copper mined over burdens of Malajkhand, M.P. reveal that *Eucalyptus grandis* perform very well followed by *Gmelina arborea, E. camaldulensis, E. tereticornis, Acacia ilanticularis, Albizia procera and Acacia nilotica.*

-- Studies conducted to determine the best suited species in coal mines over burden of Talcher (Orissa) indicate that *Pithecellobium dulce* followed by *Simaruba glauca, Cassia siamea, Dalbergia sissoo* and *Pongamia pinnata* are best suited for plantation in the area.

-- Studies conducted to determine the air pollution tolerance index of the plants growing in Korba industrial complex, show that trees like *Acacia nilotica, Aegle marmelos, Ailanthus excelsa, Azadirachta indica, Eucalyptus* species and *Ficus* species are more resistant to emissions as compared to other tree species.

-- Studiies conducted to find out the suitablity and growth performance of different nitrogen fixing trees (NFT) and non nitrogen fixing species (Non-NFT) in skelatel soil reveal that after 30 months survival was highest in case of *Dalbergia latifolia* while maximum height and collar diameter was observed in *Dalbergia sissoo.* In such soil *Dalbergia sissoo, D. latifolia, Azadirachta indica* and *Emblica officinalis* have been found to be more suitable.

-- Scientific investigations on Mycorrhizae reveal that Vescular Arbuscular Mycorrhizae (VAM) not only help in making available insoluble phosphate and potassium to the plant by solubilising them for the uptake of plants but that the hyphae of the mycorrhizae also serve as

Fig. 55 Diaper table top from a single species *(Eucalyptus tereticornis)*-an example of most economical substitute for expensive woods

effective extensions of plant root system thus providing with larger quantitites of nutrients and water. VAM fungi viz. *Glomus faciculatum, G. intraradices, G. mosseae* and *Gigaspora* sp. were screened for their efficacy in improving growth of seedlings of Neem. Casuarina, Babul, Safed Siris, Poplars, Bamboos, *Dalbergia sissoo* and *Pongamia pinnata.*

-- Research on identifying *frankia* strains that withstand salinity and drought is in progress. The glubose colony of *frankia* culture has been innoculated under the nursery conditions in Casuarina seedling before distribution to the farmers for planting.

-- *Rhizobium* culture has also been commenced and best species strains for different leguminous tree species are being identified.

-- During the year ICFRE coordinated with the State Forest Departments of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, Goa, Kerala, Maharshtra and Union Territory of Andaman and Nicobar Islands in initiating scientific management of mangrove forests.

-- In order to increase forest productivity, ICFRE Institutes have geared up their programmes for quality seed production through identification of seed production areas (SPAs) seed stands, as a first stage in tree improvement. Eleven species have been targeted for tree improvement: *Acacia nilotica, Albizia procera, Casuarina equisetifolia, Dalbergia sissoo*, Neem, Teak, Pines, Poplars, Eucalyptus, Prosopis and Bamboo. Around 8500 ha of seed production areas have been identified. More than 1500 plus trees for different species have been identified and seeds are collected and progeny tested.

-- Techniques for vegetative propagation of over 200 species including a number of medicinal plants have

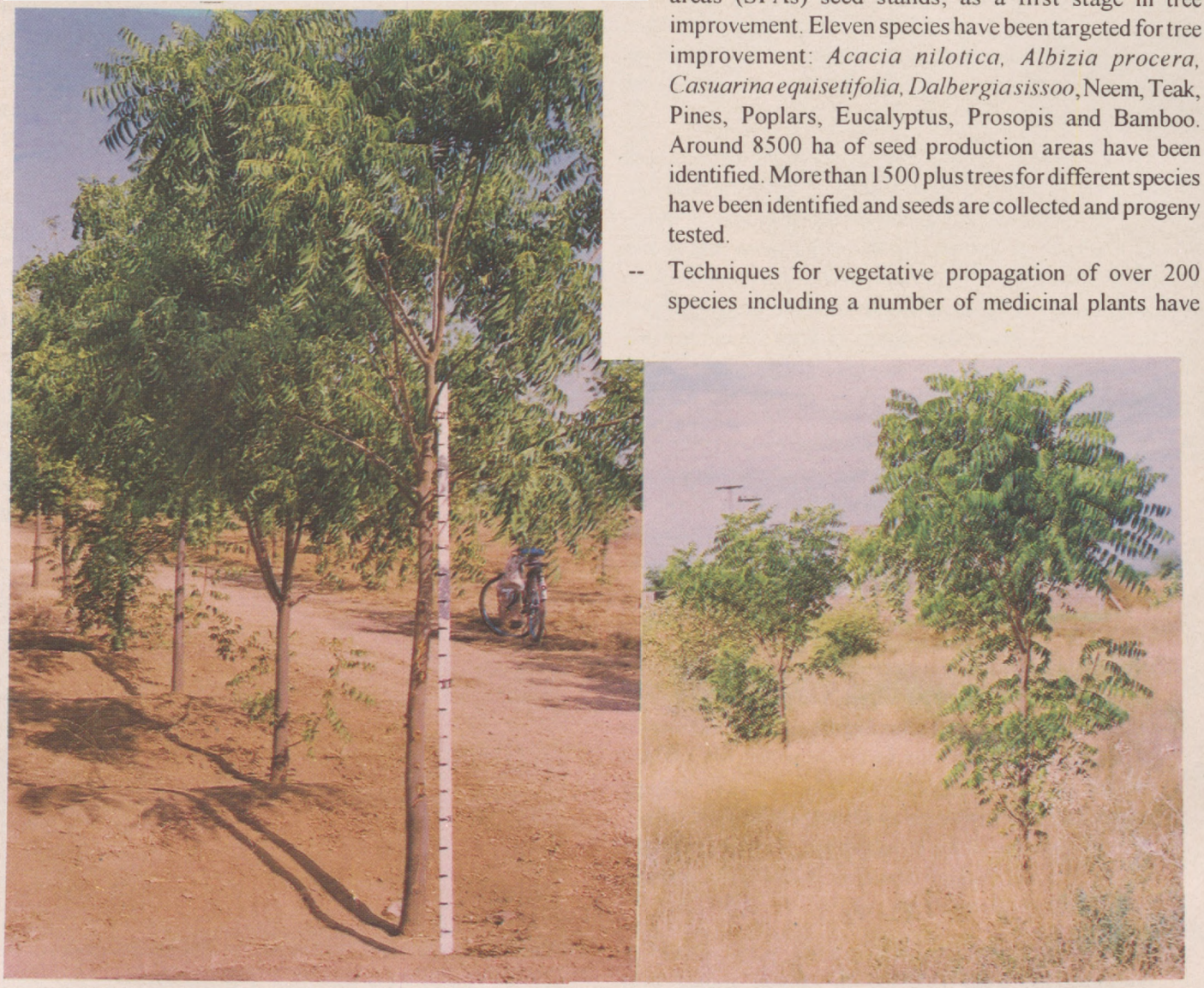


Fig. 56 Two year old Neem tree due to control (right) and ridge and furrow structures (left)

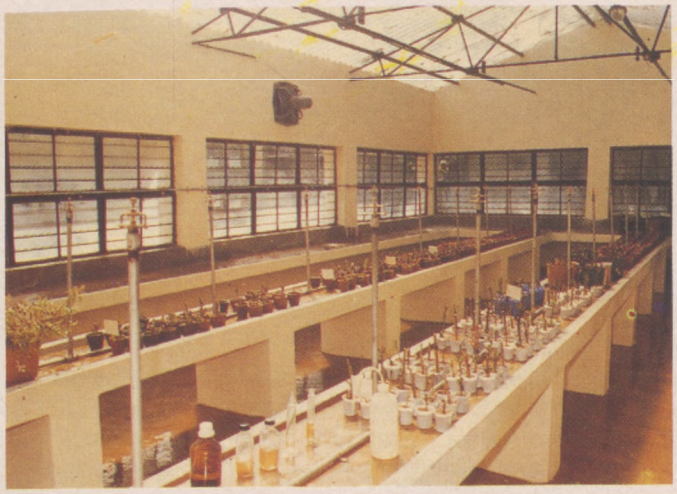


Fig. 57 A view of the mist chamber at the IWST, Bangalore

already been perfected by the ICFRE Institutes. Hedge orchad/clone banks of superior yielding materials have been developed for all the priority species.

Mist chamber complex and Tissue culture laboratory facilities have been established in all the Institutes of the Council. Species which are recalcitrant to rooting are now rejuvenated through tissue culture means to produce small planting stock which is scaled up through macropropagation approach in mist chamber complexes. Tissue culture techniques for mass propagation of *Dendrocalamus strictus, Bambusa bambos, Azadirachta indica, Anogeissus pendula, Eucalyptus species, Tecomella undulata,* Sandal, and *Bambusa nutans* and Teak have been developed. Of particular significance is Bamboo of which several thousand plants have been brought to the field. Rhizomes are induced in culture. Plants with such rhizomes get established easily in the field, and also show faster growth and early culm production.

- The TFRI, Jabalpur has developed mass multiplication protocol for edible bamboo such as *Dendrocalamus asper, Phyllostachys edulis, Dendrocalamus giganteus.* The technique developed does not involve the use of Agar or shakers; thus the cost of production is considerably reduced.

- All ICFRE Institutes have established seed storage facilities and seed technology laboratories so that quality seeds that are collected can be appropriately utilized for raising good planting stock. Seed Testing rules have been framed for all important species in order to make available certified seeds to user agencies. Phytosanitary certificates are also issued, for which different institutes under ICFRE have developed the expertise.

-- All Institutes of the Council are working cohesively on provenance trials of 21 important multipurpose tree species (MPTs) to select the best provenance in terms of yield of food, fibre, fodder, fuel, medicine, essential oils, tannins and dyes, etc. under different eco-climatic zones.

-- The council and its instituties are also developing region specific agro forestry models to increase productivity of various products and attaining the goal of deficit to surplus of forest products.

-- Studies are in progress on standardization on spacing, irrigation, high yield through crop combination and various other packages of practices as marketing, processing, etc.

-- Wide adaptability trials of *Paulownia* species are in progress to find their suitability under different agroclimatic zones.

-- Successful vegetative propagation techniques for mass multiplication of the species have been worked out.

-- Agri-silvi-horticultural models with tree species such as Teak, Casuarina, Neem, *Acacia auriculiformis, Moringa oleifera* alongwith crop component have been studied.

-- Research on developing biopesticide from plant products has been initiated at the ICFRE Institutes for controlling pests affecting forests and agricultural crops. Large

Fig. 58 Vegetative propagation of teak in mist chamber at IWST, Bangalore

Fig. 59 Fancy bentwood furniture-wood plasticization technique developed at FRI, Dehradun

number of tree species as well as the strains of tree species possessing more than normal pesticidal activity have been identified and their provenance trial is in progress. Intensive chemical study is also in progress to determine insecticidal and fungicidal properties of the extracts of various species.

-- TFRI Jabalpur has identified the casual fungus of blight disease responsible for heavy mortality in *Bambusa nutans* cultivated by the farmers of coastal belt of Orissa and has suggested control measures which has arrested the trend of mass mortality.

-- FRI Dehradun and TFRI Jabalpur have developed biological control measures for controlling Babul defoliator using dipterous parasite. Biological control of pests of Bamboos and other tree species like *Aquilaria agallocha, Gmelina arborea* is in progress using natural enemy complexes comprising viruses and other insects. *Taragama siva*, a polyphagus Lasiocampid moth affecting many trees of arid zone has been studied and its natural enemies evolved so as to put effective check on it.

-- Charcoal root-rot disease caused by *Macrophomine phaseolinams* recorded in *Pongamia pinnata, Casuarina equisetifolia, Sesbania, Eucalyptus and Albizia procera* plantations has been chekced effectively through biological control measures.

-- Three seed borers of *Prosopis juliflora, Lagerstroemia parviflora* and *Bauhinia variegata* were recorded for the first time in India. Proper storage of seeds and seed dressing with Bagalol, a mercurial fungicide @ 2-4 gram/per kg of seeds was found to eliminate the seedborne fungi. Bavistin was found to be effective in controlling seed mycoflora and enhancing seed germination.

-- IWST Bangalore has collected data on various aspects of the problem of deterioration of mangrove vegetation by marine organisms along the Goa coast. The study included collection of data on hydrographical conditions, identification of 15 species of maine borers and study of their ecology based on incidence on natural vegetation and on regularly operated test panels.

-- All the Institutes of ICFRE offered assistance to State Forest Departments and farmers falling within their respective jurisdictions by identifying the casual organism or disease in their nursery and plantations and recommending suitable control measures.

-- FRI Dehradun and IWST Bangalore carried out research on sawing, seasoning, finishing and preservation technology for small size plantation timber. The conversion yield from log form to graded sawn timber has been increased to 55-60 % and the wood wastes of conversion have also been put to commercially productive use.

-- Basic information on working as finishing quality for 80 timber species has been generated, thus offering wider choice of suitable species to be planted.

-- FRI Dehradun has standardised ammonia plastisization technique for making bent wood for furniture and other items. It has also developed an inexpensive and effective technique of ammonia fumigation for giving colours (hue) to prefinished surfaces of semi decorative woods like Eucalyptus, Mango, Subabul, Ailanthus, Oak, Rubber wood, Poplars and Babul.

-- FRI Dehradun has also evolved kiln drying schedules for 150 commercial species recording air drying behaviour, developing end coating compositions and correct stacking practices. A number of humidity control based kiln drying schedule have also been evolved. The technoogy for defect-free seasoning have been evolved for *Dendrocalamus giganteus* and *Bambusa nutans*.

-- FRI has further developed fire retardant cum anticeptic compositions and prophylactic treatment processes for protection of timber, thatch grass, reeds, palm leaves for multiple applications.

-- Wood packaging research has led to the development of cost effective designs of boxes. Wire bound veneer boxes, wire bound bamboo boxes, woven veneer mat boxes, received wide acceptance because they ensure reusability and require small capital investment for their manufacture.

-- Suitable substitutes for imported woods for manufacture of shuttles for use in textiles and jute industry has been developed by the FRI. The suitable species include Neem, Poplar, Eucalyptus species, *Anogeissus* species and *Acacia tortilis*.

-- It has also developed hard boards from mixed species and from grasses,reeds,barks, lantana, etc.

-- A process for utilisation of alkali puping spent liquor lignins for production of value added products viz. synthetic lignosulphonate having wide industrial uses, has been developed and patented by the FRI.

Fig. 60 Simple, inexpensive and effective technique of Ammonia fumigation for the manufacture of furniture-developed at FRI, Dehradun

Fig. 61 Manufacture of furniture from Eucalyptus-an economical and good substitute for more expensive woods of natural or forest origin

-- TFRI Jabalpur carried out a survey to asses the variability in oil content in seeds of *Jatropha curcas*, which indicate that oil content was highest in seeds collected from Dindori.

-- Cultivation techniques for medicinal plants of commercial importance have been standardised at various institutes and centre of ICFRE. A naturally occurring rare medicinal plant *Alectra parasitica*, a parasite on *Vitex negundo* known to cure leprosy has been multiplied.

-- Growth and yield studies, tree improvement, *in situ* and *ex situ* conservation, identification of plus trees, progeny trials, establishment of clonal seed orchads of sandal have been taken up by IWST Bangalore.

-- ICFRE Institutes have identified 282 plants whose fruits are edible, 199 plants whose leaves are edible, 104 plants having edible stems and shoots,112 plants having edible seeds, 46 plants having edible flowers and 74 plants yielding edible rhizomes, tubers and corns for use of the local tribals. Provenance trials for identifying the most suited species, are being carried out.

-- AFRI Jodhpur has developed silvi-pastoral systems in Rajasthan, Gujarat and Haryana and has identified suitable fodder species having nutritive value.

-- 3000 preservation plots have been established to protect habitats of species by preserving the species under natural ecosystems. The rare and endangered

species of desert areas are being preserved at AFRI, Jodhpur. More than 550 rare and endangered plant species have been brought to the institutional garden at TFRI, Jabalpur and their micro and macro propagation techniques are being developed.

-- 110 tribal villages have been selected for demonstrating the role of forestry in alleviation of poverty. The socio economic implication of policy, technology, management system, marketing of forest produce and improved economy through forestry have been identified as important areas of research.

-- ICFRE has started collecting statistical and marketing data at the national level to provide support in the planning process for greening the country.

-- An international project titled "Eco-rehabilitation of Himalayas" has been initiated with support from IDRC in which Nepal, Bhutan and China are also participating.

Indian Plywood Industries Research and Training Institute (IPIRTI), Bangalore

The IPIRTI, an autonomous organisation of the Ministry, undertakes research to enlarge service life of wood and wood products, economise wood volume in end use and reduce wastage in conversion and application. The focus of research is basically on reduction of pressure on natural forests. The research activities of the IPIRTI focussed on the following areas during the year.

-- Formulations of effective methods for protection of wood and panel products.

-- Investigations on the peeling, drying the gluring characteristics of imported species of timber for plywood manufacture.

-- "Small-Log Optimizing" technologies for maximization of productivity.

-- Development of panel materials (environment friendly) from non-wood forest products and agricultural residues.

-- Development of new adhesives and improvements to the known formulations.

-- Studies on the physical and mechanical properties of wood, plywood and other wood-based panels.

-- Development and engineering applications of plywood and other lignocellulosic panels.

-- Improvements in plywood processing technologies.

-- Rationalisation of the test procedures and development of new test methods for incorporation in the Indian Standards Specifications.

-- Development of new instruments for quality control.

-- Implementation of 'Total Quality Control (TQC)' methods in plywood units to optimize yield and reduction in wastage.

-- Dissemination of appropriate designs in furniture manufacture.

Research findings are disseminated on a regular basis to the industries through workshops demonstration, etc. As in the previous years, the scientists of the IPIRTI continued to publish papers in reputed Indian and foreign journals.

The IPIRTI also undertook the following consultancies during the year:--

-- Treatment of soil and antivibratory material used for cladding the building foundation of vibration proof buildings.

-- Developing a suitable PF resin manufacturing process for bonding BWR/BWP grade plywood to M/s CIBATUL Ltd.

-- Examining safety of the wooden trussed rafters supporting roof of billiards room in Bangalore Club.

-- Design, estimate and drawing for low cost shelter using bamboo mat board for DRDA establishment in Ananthpur.

Details of Research Activities under Ganga Action Plan

During the year 1994-95, the thrust of the research work continued to be on scheme specific activities which could be gainfully utilised in the implementation of the Ganga Action Plan (GAP). The research studies, are therefore being carried out in the identified thrust areas such as water quality, pollution monitoring, biodiversity and bioconservation, cost effective innovative technologies in sewage treatment with emphasis on resource recovery and impact assessment as core areas.

The water quality monitoring programme has been revised in consultation with the experts and with the approval of the Monitoring Committee for GAP. All the

water quality monitoring stations shall now be monitored for core parameters and certain identified site specific parameters which could indicate the defaulting industrial units discharging effluents without proper treatment into the river. To have a better assessment of the river water quality, analysis of the sediments has also been included besides monitoring the outfall drains within the action plan area. The emphasis in the revised water quality monitoring is on collecting the data in such a way that it could be translated into fruitful information for monitoring the defaulting units whether municipal or industrial. Water quality monitoring has also been initiated for river Yamuna including Western Jamuna Canal and Hindon river besides river Gomti. Five automatic water quality monitoring stations commissioned at specified locations on river Ganga have also started yielding data. River modelling exercise are also being taken up for the rivers Krishna, Tunga and Bhadra through NEERI, Nagpur and Centre for Environmental Science and Technology, SJ college, Mysore. The sewage treatment plants constructed and commissioned under GAP are being monitored for performance independently through water quality monitoring teams every month.

Experiments have been initiated to disinfect the sewage from bacterial pollution by using new technologies based on UV Radiation and Gamma Radiation. Studies are also planned to use chlorination to disinfect the treated sewage by determining the appropriate doses. Simultaneously, studies are also being carried out to gauge the impact on river and ground water due to possible pollution from the community toilets constructed under GAP. Experiments

Fig. 62 The Asiatic Lion, *Panthera leo persica* (Meyer) in Gir forest-fighting for its survival

Fig. 63 Crocodile, a threatened species, breeds readily in captivity-a technique adopted by various Breeding Centres to save this species

are under way for treating the sewage using aquaculture as a tool which shall not only be cost effective but shall also yield resources which could be utilised for operation and maintenance of the sewage treatment plants. Feasibility of using vermiculture technology for treating domestic waste is also being studied. The technology of afforestation using raw sewage developed by CSSRI, Karnal is being taken up in the town of Agra under Yamuna Action Plan and in some other towns of Madhya Pradesh under the NRAP.

The five on-going research projects on biomonitoring and bioconservation using indicators species approach are being continued. Turtle rehabilitation programme is being replicated in the Mathura Agra region under YAP keeping in view the scavgening habits of the softshelled turtles which helps in pollution abatement of the river from dead and decaying organic matter.

Under the direction of the CGA, surveys and studies are proposed to be initiated to tackle the problem of pollution in the non-perrenial rivers and drains of coastal areas.

Wildlife Research

Wildlife Institute of India, (WII), Dehradun

WII's research covers a wide range of ecological, biological, management and socio-economic aspect of wild life conservation; aims to strengthen the conservation efforts through generation of scientific information and by creating a code of personnel base consisting of trained

biologists, wildlife ecologists and managers. Out of the nineteen ongoing research projects, 4 have been completed till date. Eleven new research projects have been initiated during the reporting period. In addition to this two WII-USFWS Collaborative research projects (i) Turtle and Tortoise Conservation Project (ii) Ecology of Indian Squirrel, are also under progress. The project on Turtle and Tortoise has been completed. One faculty member has

Fig. 64 Hunted for its coveted underwool, the Ibex (*Capra ibex*) - an endangered animal in the Western Himalaya

been awarded Ph.D by Rajasthan University for his work on the Ecology of three large sympatric ungulates (cheetal, sambhar & nilgai) with special reference to reserve management in Sariska Tiger Reserve, Rajasthan. Another faculty member has completed research work on Habitat Ecology of major ungulates in Kedarnath Musk Deer Sanctuary and the thesis has been submitted to Saurashtra University.

All twelve research projects submitted to the Research Advisory Committee during this year have been approved in principle. Work on the following five projects are likely to begin soon--An ecological study of conservation of biodiversity in Great Himalaya National Park ; Tourism Impact Assessment in Corbett National Park' Status Survey of elephants in Arunachal Pradesh and adjacent areas in Assam; Ecology of gaur in Pench Tiger Reserve, Madhya Pradesh and Developing approaches to the management of elephant population in West Bengal for mitigating man-elephant conflict.

A short survey project on identifying and suggesting alternate habitat for the Asiatic lion has been completed and the final report is being submitted to the MoEF and State Forest Department for comments.

One WII faculty member has been selected to participate in the XIV Indian Expedition to Antarctica. He will be involved in collection of relevant data in order to design a long term monitoring programme for conservation of mammal and bird species of Dakshin Gangotri and Maitrai region of Antarctica using GIS/GPS technology.

The Environmental Impact Assessment Cell of WII, has undertaken the following major consultancies during 1994-95:--

-- Impact Assessment of Haldia--Barauni pipeline project on wildlife values.

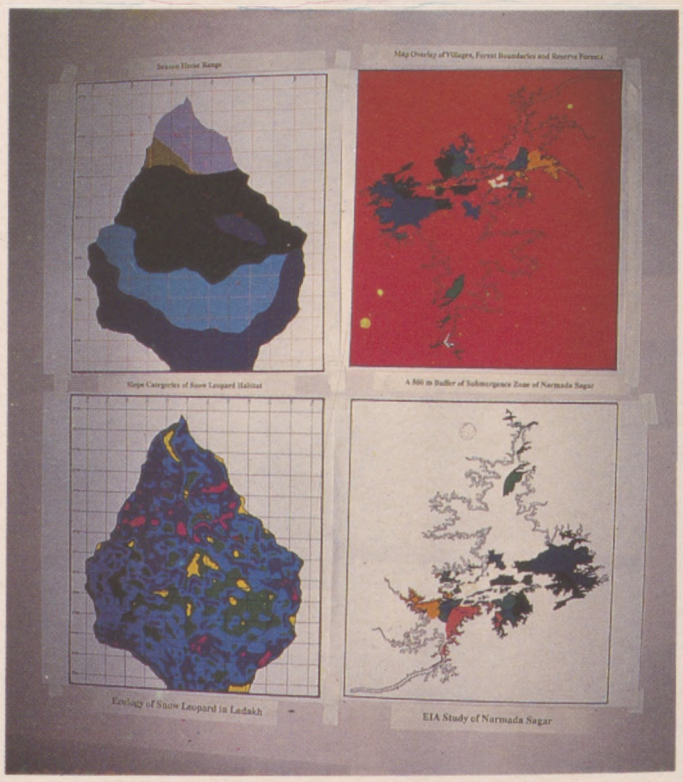


Fig. 65 Maps generated through Computer Aided Design using GIS by WII, Dehradun

Fig. 66 Night heron at the Keoladeo Ghana National Park, Bharatpur.

-- Impact Assessment study of the augmentation of Salaya Viramgam section of the Salaya-Mathura crude oil pipeline on wildlife values.

-- Impact Assessment study of the augmentation of Viramgam--Koyali section of Salaya--Mathura crude oil pipeline on wildlife values.

-- Impact Assessment study of the augmentation of Viramgam--Chaksu pipeline and the proposed Chaksu--Panipet pipeline on wildlife values.

-- Impact Assessment of the proposed Mathura--Delhi--Ambala-Jalandhar hook-up pipeline on wildlife values.

-- Impact Assessment of Dahej--Gandhar--Baroda pipeline project on wildlife values.

-- Impact Assessment of Bombay--Manmad pipeline project wildlife values.

-- Environment Impact Assessment of LPG recovery plant project (Usar, Maharashtra) on wildlife values.

-- Environment Impact Assessment of Paradeep--Daitari crude oil pipeline (PDPL) project on wildlife values.

-- Environment Impact Assessment of Johrat-Numaligarh crude oil pipeline project on wildlife values.

The following Environmental Impact Assessment studies have been completed during the year:--

-- Impact Assessment studies of Narmada Sagar and Omkareshwar projects on flora and fauna with attendant human aspects.

-- An ecological assessment of the proposed protected areas in Narmada Sagar and Omkareshwar project areas using remote sensing and Geographical Information System.

Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore

Research on issues related to conservation of bio-diversity is the major objective of SACON, which is an autonomous organisation of the Ministry, located at Coimbatore. During the year, SACON continued research activities on the following areas:--

-- Conservation of the bio-diversity of ecosystems through studies on major elements.

-- Basic avian ecology.

-- Economic ornithology.

-- Conservation of the bio-diversity of fragmented forests of the Western Ghats.

-- Ecotoxicological studies to assess the impact of pesticides and industrial effluents on the bio-diversity and human environment.

-- Monitoring of habitat changes.

-- Impact of human interference on the plant, bird and fish communities in the Nilgiri Biosphere Reserve.

-- Ethnobotanical studies of medicinal plants.

-- Detailed studies on and recovery programmes for endangered species.

Fig. 67 A pair of Ibis breeding in a heronry

-- Remote sensing and Geographic Information System (GIS) as tools in rapid assessment of bio-diversity.

-- Conservation and sustainable use of wetlands.

-- Ecosystem modelling and simulation.

-- Establishment of data base on bio-diversity.

The publication of "Update" in ornithology and wetlands was continued to disseminate information relating to literature on bio-diversity.

National Natural Resources Management System (NNRMS)

The NNRMS scheme was launched with the prime objective of the utilisation of remote sensing technology with conventional methods in monitoring of natural resources by addressing the following aspects:

-- Optimal utilisation of the country's natural resources by a proper and systematic inventory of the resources availability.

-- Reducing regional imbalances by effective planning and in tune with the environmental efforts.

-- Maintain the ecological balance with a view to evolve and implement the environmental guidelines.

A Standing Committee on Bio-resources and Environment (SC-B) has been constituted to advise on the methods of using the Remote Sensing Technology for optimal use and the management of natural resources in the country. It also identified the improved methods for the management of resources by integrating conventional survey data and remote sensing based information and generates specific national programme/projects. The Committee has identified 37 priority areas for undertaking research projects involving remote sensing technology.

During the year, the Committee reviewed nine-on-going projects and sanctioned four new projects to various institutions. The list of the projects sanctioned during the year is given at Annexure II.

8

EDUCATION, TRAINING AND INFORMATION

Forestry Education, Training and Extension

Indian Council of Forestry, Research and Education (ICFRE), Dehradun

The Indian Council of Forestry Research and Education (ICFRE), an autonomous institution of the Ministry is the focal point for forestry research, education and extension development in the country. Transfer of technology, creation of public awareness, extension of technical support to State Forest Departments. NGOs, etc., coordination and collaboration between users and scientific groups are the major areas of ICFREs forestry extension programmes and the council achieves these through publication of brochures, books and pamphlets, organisation of short term courses and seminars, production of films and other audio-visual programmes, adoption of villages for developing social forestry/agroforestry models and transfer of technology from lab to land.

During the year, thirty brochures on multipurpose tree species and 10 books and monographs on various aspects of forests have been brought out by the ICFRE Other publications of the ICFRE include Annual Report (Hindi and English), leaflets and bulletins such as the Neem Network bulletin (Vol. 1, 2 & 3), Seed bulletin and Timber Trade bulletin. Special issues of Indian Forester and Van Vigyan were brought out to highlight important aspects of forestry like vegetative propagation, Joint Forest Management, Biodiversity and Sustainable Development.

The following activities were also undertaken by the Council during the year:

-- Regular training capsule courses of one week duration in seed technology and bio-fertilizers were conducted in its various institutes.

-- A national seminar on wood utilization in 2000 and beyond was organised in Shillong.

-- A conference on role of forests in environment was organised in Dehra Dun.

-- A seminar on 'Forests and Rural Development' was organised in Dehra Dun.

-- Regional meetings/workshops conducted in the ICFRE institutes were largely attended by the State Forest Departments/NGOs, industries to develop linkages between research and user agencies.

-- An International Forestry Research, Education & Extension Project Workshop was launched at Dehra Dun which was attended by international experts, foresters of eminence, university teachers, NGOs,etc.

-- An international cosultation on Neem improvement was organised at Jodhpur in which 45 experts from 13 countries participated.

-- For developing research extension linkages involving technology transfer and for alleviation of poverty, 109 villages were taken up by ICFRE institutes involving 50,000 farmers. User friendly agro-forestry packages compatible with edaphic and local requirements have been developed.

-- A thirty minute videofilm (Van Anusandhan) on high band U-matic format has been prepared and telecast on Doordarshan Network and four more U-matic films are also under production.

-- A National Forestry Library has been established and will be linked to other libraries through NICNET. Networking of the libraries of all the institutes of ICFRE is being developed through Indian Forest Library and Information Networking (IFLIN).

-- Indian Forestry Research Information System(IFRIS)_ is under development to evaluate, systematise and disseminate research results through various electronic methods and networks.

Forest Research Institute (FRI), Dehradun

The Forest Research Insititute (FRI), a deemed university since the year 1991, has the following objectives:

-- To impart education in such branches of forestry and environment as it may deem fit.

-- To provide for research and advancement of and dissemination of knowledge in the field of forestry and environment.

-- To create consciousness about forest and environment among people through forestry extension programmes.

-- To do all such other acts and things as may be necessary and desirable to further the safeguarding of environment and protection of forest and wildlife.

In order to boost research efforts and simultaneously create manpower for forestry research,the FRI aims at attracting promising students of forestry and allied sciences to undertake research work.

The highlights of the activities of the FRI during the year are as follows :

-- The FRI has received requests from Jordon, Combodia, Laos, Vietnam, Myanmar, Nepal and Bhutan to help them in starting forestry education programmes and activities for their foresters.

-- FRI extends financial help to other Indian Universities offering forestry courses in their academic curriculum and also helps them in designing the syllabus for various courses in forestry.

-- 207 candidates from India and abroad have so far been registered for Ph.D in the field of Silviculture, Forest Management, Forest Economics, Genetics, Forest Botany, Forest Soil,Forest Protection, Ecology and Environment, Biodiversity, Social Forestry, Non-wood Forest Products,Forest Utilisation and Socio-economic issues.

-- Three one-year Post Graduate Diploma Courses have been completed during the period in which a total of 29 students participated including 5 from Myanmar and 2 from Nepal.

-- For facilitating field foresters in pursuing their academic interest, AIFC Diploma has been assessed and declared equivalent to M.Sc. (Forestry) vide notification NO. 4-72/90/BOM/RCS, dated 14.8.92.

-- A 12 week's course on Forest and Land Management, Management of Mangrove Ecosystems and Environmental Education was conducted. Inservice officers including three from Myanmar participated in this Course.

Indian Plywood Industries Research and Training Institute (IPIRTI), Bangalore

The IPIRTI, an autonomous body of the Ministry of Environment and Forests, is a centre of expertise in the mechanical wood industries technology sector and is equipped with modern facilities for research and training in saw-milling and plywood. It provides training in the relevant fields to improve skills, upgrade products quality, optimise production cost and to enhance international competitiveness of the products.

The following training courses/seminars were conducted by the institute during the year:

-- A total of 8 short-term courses on various aspects of plywood were organised in which about 56 candidates were trained.

-- Twenty-seven candidates have completed the 5th one-year Certificate Couse in Mechanical Wood Industries Technology; and 29 candidates have been admitted for the 6th Course which has started from 19.10.1994.

-- During the year, the Institute also attended to a number of technical enquiries received from the industry, consultants, Govt. Departments, public undertakings, enterpreneurs, research workers, etc.

Indian Institute of Forest Management (IIFM), Bhopal

The IIFM, an autonomous body of the Ministry imparts education and training in forest management aimed at inculcating professionalism in forestry management.

Highlights of the activities of the 11FM during the year were as follows :

-- Twenty seven students including 11 ladies are currently undergoing the 2 year PG programme in forestry management.

-- Seventeen people from four countries have been admitted to the first M.Phil level course in resource management which has been started from June, 1994.

-- Four Management Development Programme and 2 National Workshops have been conducted till December, 1994.

-- The faculty members of IIFM are involved in research work also and 17 new projects have been sanctioned in addition to the 10 on-going ones.

-- A Regional Centre of the National Afforestation and Eco-Development Board has been set up at the IIFM in 1989. This Centre also organised two national workshops and one training programme besides carrying out research related to eco-development, wasteland development and people's participation.

The following publications have been brought out by IIFM during the year.

-- Gender issues in forestry-case of Samardha.

-- Gender issues in Joint Forest Management - More than a trendy issue.

-- Sal leaf plate industry in West Bengal.

-- Proceedings of the National Workshop on Farm Forestry Management.

Indira Gandhi National Forest Academy (IGNFA), Dehradun

Established in May, 1987, the IGNFA is a premier institution imparting in service professional training to the Indian Forest Service (IFS) probationers. This Academy has so far trained 1677 IFS probationers and 228 foreign trainees from neighbouring countries.

Sixty three IFS probationers including four ladies passed out during the year and 83 probationers are currently undergoing training.

A one week special course in Joint Forestry Management was conducted by the Institute of Biosocial Research and Development (IBRAD), Calcutta, at the IGNFA during the year, Another one week training in general management aspects was organised by Defence Institute of Technology Management, Mussoorie. In a one week direct trainers skill course conducted at the IGNFA, seven faculty members where trained.

Besides these, the Academy also conducted in service training courses of 3 weeks duration on "Computer Application in Forestry" and "Project formulation and appraisal" for senior IFS officers from various States.

A micro-earth station has been set up at the IGNFA which provides access to the NICNET database in all the districts of the country and to resource centres of the world.

Directorate of Forest Education

The Directorate of Forest Education, Dehradun, coordinates the training of forest service officers and Rangers provided by the following colleges:

-- State Forst Service College (SFS), Dehradun

-- State Forest Service College (SFS), Coimbatore

-- State Forest Service College, Burnihat

-- Eastern Forest Rangers' College, Kurseong

The two years Diploma Course in forestry for SFS Officers is being continued in the SFS Colleges at Dehradun and Coimbatore and about 90 officers from various States are attending these courses.

Sixty Forest Rangers are being trained at the Eastern Forest Rangers College at Kurseong.

The three SFS Colleges together have also conducted twelve inservice Refresher Training Course of two weeks duration each, for SFS Officers, during the year.

Wildlife Education and Training

Wildlife Institute of India (WII), Dehradun

The regular activities of the Wildlife Institute of India (WII) consisting of inservice training to IFS officers in wildlife management, training of selected life science graduates in wildflie science at M.Sc. level, conduct of research on various aspects of wildlife conservation at various locations in the country and consultancy on environmental impact assessment of development projects and other conservation related matters for central and state governments and other institutions were continued during the year.

The WII conducted the following regular and short-term courses and seminars/workshops during 1994-95:

-- The 9 month Diploma Course for PA managers, in which fifteen officers from nine States participated.

-- The IV M.Sc. course which commenced in July, 1993 is in its fourth semister involving field research projects.

-- The 2nd Eco-development planning course under the WII-UNDP Collaborative Project which began in February, 1994, was completed successfully in May, 1994. Eleven participants from seven states, 3 NGOs and one faculty member from Indian Institute of Remote Sensing attended this training programme.

-- The 2nd Management Planning course was conducted during September-December, 1994; four officers from four states attended this course.

Both these courses are supported by WII-UNDP Collaborative Project on "Strengthening the Wildlife Management Planning &Ecodevelopment Planning Capabilities".

-- A one-week course for the Indian Forest Service Officers was organised to impart basic understanding of wildlife and Biodiversity Conservation through a well managed network of PAs with special emphasis on the role of the forest officer in managing the forest area outside PAs with appropriate application of conservation principles.

-- 3-week course in wildlife management was organised to provide basic wildlife management capability to those IFS officers who are managing wildlife areas without any formal training in wildlife management.

-- A 2-week course in Zoo-management was organised from 29 Dec. 1994 to 10 Jan. 1995 at National Zoological Park,New Delhi for Zoo professionals.

-- The Eighth Annual Research Seminar (ARS) of the WII was held during 28th to 30th September, 1994. Seventeen States and two Union Territories were represented by forest officers and scientists. Twenty nine research presentations, based on 20 on-going and four completed research studies, were made by WII researchers and faculty members.

-- The first regional workshop on the "Coordination and Monitoring of Wildlife Research", held on 30th September, 1994 generated a lot of useful discussion on regional and national coordination of wildlife research and monitoring.

-- The Annual General Meeting of the WII-Society was held in July, 1994 at New Delhi. It was chaired by the Hon'ble Minister of Environment and Forests, Govt. of India, Shri Kamal Nath.

-- A two day workshop on "States and Management of Coastal Wetland Protected Areas in India" was conducted in April, 1994. The participants came from several coastal states and the island groups. The workshop reviewed the on-going efforts in coastal wetland conservation in India and highlighted the need to conduct specialized training programmes for higher and middle level coastal wetland managers in India. A draft curriculum for such training was developed during the workshop and it is proposed to initiate such a training programme as a part of the regular training calendar of the WII.

-- A 3-day interactive workshop on the theme "Forestry in support of Biodiversity Conservation" was organised for Principal Chief Conservators and Chief Conservators of Forests in Bandipur Tiger Reserve from 5th to 7th December, 1994. Sixteen officers attended this workshop and deliberated on orientation of forestry programmes to support biodiversity conservation and the need for preparing good management plans for protected areas and forest divisions in order to integrate biodiversity conservation with forest management.

WII conducted a four day workshop on Wildlife Tourism Management from 13th February, 1995 to highlight the need for appropriate wildlife tourism management in protected areas. The target group consisted

of officers of Tourism Departments of States, and Central Government, PA managers and private enterpreneurs in tourism business.

As a part of World Environment Day celebration, WII organised several nature education activities for local school children and children of WII faculty and staff on 5th June, 1994. A video film produced by the institute titled "We are nature, Nature is our world" was telecast on the national network of Doordarshan on 7th November, 1994.

WII is presently involved in helping the local Army Unit in developing and conducting a training for trainers workshop for Army officers.

Computer, GIS and Database

During the year, the computer facility of WII was further strengthened by addition of new hardware and software such as 60 Mhz Pentium fileserver with 16 MB RAM. A handhold bar code reader has been procured to upgrade the library facilities. A new harddisk drive of 2.0 GB has been procured for the SUN sparestation system. The harddisk of 486 DX used for GIS has been upgraded from 130 MB to 1.0 GB. A Global Positioning System (GPS) has also been procured which is expected to be of immense value to researchers working in the field.

Recently, WII has been linked up to E-Mail via ISNET (Integrated Systems Network): it thus can access various global networks now.

The Computer Centre of WII has begun conducting short training courses on use of computers and various software packages to the faculty and staff of WII as well as trainees of regular courses. Two computer personnel were deputed to undergo a four week training programme on GIS and Remote Sensing in Indonesia. This training course was organised and funded by FAO in collaboration with German Foundation for International Development and the Ministry of Forests, Republic of Indonesia.

Library and Herbarium

During the year, about 1200 books on various subjects have been added to the library. A new automation software Libsys, has also been procured. The herbarium section of the WII has recently started computerization of titles of herbarium and a checklist of 410 species of plants belonging to 276 genera and 85 families found within WII campus, has been published. During the year the WII herbarium has completed identification, monitoring and processing of 400 plant species brought from various study sites.

Formal Environmental Education

The Ministry of Environment and Forests interacts actively with the University Grants Commission (UGC), National Council of Education, Research and Training (NCERT) and the Ministry of Human Resources Development (MHRD) for introducing and expanding environmental concepts, themes, issues etc., in the curricula of schools and colleges. The two Centres of Excellence on Environmental Education of the Minstry are also fully involved in the activities of the UGC, MHRD & NCERT related to formal environmental education.

Non-formal Environmental Education and Awareness

Environmental Education, Awareness and Training plays a significant role in encouraging and enhancing people's participation in acitivities aimed at conservation, protection and management of environment, so essential for achieving sustainable development. The Ministry, therefore, accords priority for the promotion of non-formal environment education and creation of awareness among all sections of the society through diverse activities using traditional and modern media of communication.

National Environment Awareness Campaign (NEAC), 1994-95

This Ministry has been organising the National Environment Awareness Campaign (NEAC) every year since 1986 with the aim of creating environmental awareness at all levels of the society, While the main themes for this year's NEAC were Joint Forest Management, Eco-development and Montreal Protocol. The Campaign also addressed other environmental issues such as soil conservation, people action and role in waste utilisation, environmental education, awareness and communication, fuel, fodder, zoo education, conservation and captive breeding of endangered species, wildlife protection etc.

About 2200 organizations comprising of NGOs, schools, colleges, universities, research institutions, women and youth organisations, army units, Government Department, etc., from all over the country were provided financial assistance for organising various awareness creating activities such as seminars, workshops, training

Fig. 68 National Environment Awareness Campaign activities at a village in West Bengal

courses, camps, padayatras, rallies, public meetings, exhibitions, essay/debate/painting/poster competition for school children, folk dances,street theatres and for preparation and distribution of environmental education resource materials. The target group covered under the campaign are student/youth/teacher,women, NGOs, farmers, tribals, rural population, general public, professionals, voluntary workers etc.

Eighteen organisations located in different parts of the country were designated as Regional Resource Agencies (RRAs) for assisting the Ministry in planning, implementing, monitoring and evaluating the activities of NEAC in their respective areas. These RRAs played a key role not only in selecting participating agencies for the campaign programme but also in implementing the campaign in their respective areas of jurisdiction.

Eco-clubs

A new set of guidelines on Eco-clubs was circulated during last year to the State/UT Governments, NGOs, Educational Institutions etc. The Scheme envisages participation of school children in various activities related to ecological conservation and preservation of the environment. The Eco-clubs are established in Government recognised schools and each club has 20-50 members taken from among the students of class VI to X. A group of 20-50 Eco-clubs in one or more geographically contiguous districts are serviced by a Coordinating Agency, which may be an educational institution, a NGO, or a professional body. About 2000 Eco-clubs have been set up so far.

Paryavaran Vahinis

The Paryavaran Vahini Scheme launched during 1992-93 with the basic objective of creation of environmental awareness through people's participation and reporting on violations of environmental legislation and environmental degradation was continued during the year, So far, 183 districts spread over 25 states and 4 Union Territories and showing high incidents of high pollution and density of forest and tribal population has been identified for constitution of suchVahinis. The Vahinis are functioning under the charge of the District Collectors, who take follow-up action on the complaints received from various members by pursuing the matter with the respective authorities.

Films and Audio Visuals

Realising the potentials of films/audio-visual in spreading environmental messages among the masses, the Ministry continued its financial support for the production of documentary films/audio-visuals etc., on various aspects of environment so that these are screened at various fora as well as telecast through Doordarshan. During the year, the Ministry commissioned 18 such films, the list of which is given at Annexure IV.

Communicatiion/Awareness Programme of NAEB

Films

During the year 3 films on the following themes have been produced;

-- Green Haryana Programme

--- Blue Flames/Green Villages

-- Participatory Forest Management

Copies of three films 'Harmony in Arabari', Sustainable Forestry-a collective effort' and 'Common Cause-Participatory Forest Management in the Shivaliks' were distributed to Forest Departments of all the States, Union Territories and training institutions. The film 'Harmony in Arabari' was telecast by Doordharshan.

Team visit/Training

A team of journalists from UNI, Indian Express, Times of India, and PIB visited the project areas of Society for Hill-Resource Management School in Daltonganj, Bihar, to see the experiment of Chakriya Vikas Pranali. A visit

of RPOs was organised at Palamau for training the Forest Officers on JFM. Besides this a training programme on micro-planning sponsored by the NAEB was conducted by the School of Fundamental Research. Calcutta.

Centres of Excellence

The Ministry set up the following five Centres of Excellence with a view to strengthening awareness, research and training in the priority areas of Environmental Science and Management:

-- Centre for Environment Education, Ahmedabad (linked with Nehru Foundation for Development, Ahmedabad).

-- CPR Environmental Education Centre, Madras (linked with Sir C.P. Ramaswamy Aiyar Foundation, Madras).

-- Centre for Ecological Science (linked with the Indian Insitute of Science, Bangalore).

-- Centre for Mining Environment, Dhanbad (linked with the Indian School of Mines, Dhanbad.

-- Salim Ali Centre for Ornithology and Natural History, Coimbatore (linked with the Bombay Natural History Society, Bombay).

Centre for Environment Education (CEE), Ahmedabad

The CEE, Ahmedabad was set up in 1984 to develop and carry out nation-wide environmental education programmes and activities. Highlights of the activities of the Centre during the year 1994-95 are as follows:

-- To mark 10 years of CEE's existence, a Seminar "CEE-10-21" was organised to introspect and review what has been acheived, to assess the strength and limitations of the institution and to set courses of action for the future.

-- The eight month long "Training in Environment Education Programme (TEE)" was continued. TEE-94 has commenced in November, 1994.

-- Three short courses viz., "Biodiversity Teach-in", "People's institutions in Forest Management" and "Environmental Education for children, what, why and how", were organised under the Teach and Learn Environmental Education Modules (TALEEM) programme.

-- Collection of EE materials and experiences from all over the country was continued during the year and new nodes of the EE Bank have been established in Guwahati and in Pune.

-- Under the South and South-East Asia Network for Environmental Education (SASEANEE), a two-month 'Internship on EE" was organised at Ahmedabad in which in-service professionals from six countries including India participated. Another focus group seminar-cum-training was held in Bangalore on management of solid waste, which was attended by participants from five countries.

-- A six week summer vacation project "Clean Green Summer Project" was organised for students in the 13-21 years age group which sought to promote integrated management of house-hold garbage through partnership between citizens and the Ahmedabad Municipal Corporation.

-- CEE continued to interact with a range of industries, particularly in the small scale sector to document environment protection issues based on *in-situ* analysis in representative industrial estates of Gujarat.

-- Under 'Civic Forum' two sets of articles, one focussing on the deterioration of Ahmedabad city's roads and the other focussing on the public health, environmental sanitation and hygiene in the context of the out break of plague in Surat were published in the Ahmedabad edition of a national newspaper.

-- Work is in progress to compile a co-curricular publication for school children in Ahemdabad focussing on the urban environment.

-- CEE-NFS continued to send out fortnightly despatches on environmental issues in Hindi and English for non-exclusive use by small and medium newspapers and periodicals across the country. Exclusive services are being provided to a few national newspapers in English and to a local newspaper in Hindi.

-- Activities relating to bio-gas, animal husbandry, afforestation, social fencing, were continued under the Ranthambore and Hingolgadh Eco-development Programmes. A 'Parikrama' was organised in the villages of the Sukhbhadar Watershed area to raise awareness about various water related issues.

-- A field office has been set up at Amreli for executing the Amreli Project which aims at action relating to water-associated health and sanitation issues in fluorosis affected villages of Lathi and Liliya taluks of Amreli District.

-- Sixtysix teachers participated in two Nature Education Camps organised at Sasan in Collaboration with the Gujarat State Forest Department.

-- A comprehensive report has been prepared of the work done so far under cluster approach to EE and the Environmental Orientation to School Education project of the Ministry of Human Resources Development. EE activities in the cluster schools of Orissa and West Bengal were monitored. A 10-day course on Environment Education in Indian Schools was organised for officers of the Ministry of Education, Malaysia.

-- A state level meeting was organised to critically review the section on Environment in India's country paper for the 4th World Conference on Women to be held at Beijing in 1995.

The following publications were brought out during the year.

-- A paper on "Conservation of Biological Diversity: An Approach" was prepared for the Meeting of the Conference of Parties held in the Bahamas in December, 1994.

-- A background paper on "Primary Environmental Care" was prepared for UNICEF Regional Office for South Asia.

-- Plague: A citizen's primer" was published in the wake of the out break of plague to disseminate basic essential information about the disease to the general public.

-- The Hindi version of the UNESCO-UNEP newsletter connect titled "Sampark" was continued to be published.

-- The report of the task force on Kachchh Marine National Park was prepared and presented at the National Conservation Congress held in New Delhi in November, 1994.

-- Four books for children on environmental topics have been produced for the SACEP (South Asia Co-operative Environment Programme), Colombo.

-- College level Teacher's guide for teaching environmental topics at the undergraduate level are being prepared,based on a similar publication of the World Resources Institute.

-- A series of well-researched, authoritative books on environment and sustainable development in India, are being produced with financial support from the Ford Foundation and the Swiss Development Co-operation. The first title is ready for publication.

The following audio-visuals have been produced :

-- A video-documentary on the denotification of the Narayan Sarovar Sanctuary has been completed in collaboration with the Development and Educational Communication Unit (DECU) of the Space Application Centre, Ahmedabad.

-- It is proposed to prepare a series of films for college students, along the lines of the 'Race to Save the Planet' in collaboration with DECU and work on the first film on 'Solid Waste Management' has been initiated.

-- Six short video spots on environment have been produced for the consortium for Educational Communication and the Central Institute of Educational Technology (CIET); some of these have been telecast over Doordarshan's Metro Channel.

-- A set of 32 four-colour transparencies describing the overall policies and programmes of the Govt. of India with respect to sustainable development has been prepared for use of the Ministry of Environment and Forests.

CEE participated/organised the following exhibitions:

-- An exhibition for children "Act now" dealing with environmental issues was put up in Ahmedabad and Bangalore.

-- A photographic exhibition was designed and installed on the occasion of CEE-10-21 Seminar.

-- Signages have been worked out forVir Bhumi.

-- Design and development of the Bharatpur Interpretation Programme has been completed.

-- A logo/symbol is being designed for the Central Zoo Authority.

C.P.R. Environmental Education Centre (CPREEC), Madras

The CPREEC, set up in 1988, continued to conduct a variety of programmes to spread awareness and interest among the public on all aspect of environment and ecology with a view to promoting conservation of nature and natural resources.

Fig. 69 An exhibition on environment organised by the C.P.R. Environmental Education Centre, Madras

Highlights of the various activities undertaken by the Centre during the year were as follows:

-- Training programmes were conducted for NGOs, rural workers, government officials, farmers, women etc in the states of Tamil Nadu and Andhra Pradesh.

-- Seminars on ''Environmental Protection, People and the Law'' were organised in several cities of the country in collaboration with other NGOs.

-- Teachers' Training Programmes for the entire school district of Madras Corporation and for students of B.Ed and M.Ed. courses have been conducted in Tamil Nadu, Andhra Pradesh, Goa and Assam.

-- A Summer Workshop for Children was conducted during April-June, 1994 in which about 300 students from Madras participated.

-- Activities relating to the ''Eco-restoration of the Coastal Areas of Tamil Nadu and A.P.'' were continued. Slides, booklets, posters and pamphlets have been prepared on mangroves,coral reefs, seashores, etc.

-- Various awareness raising activities were organised for Students and Teachers during the 'Earth Day' and 'World Environment Day'.

-- Several exhibitions on environmental themes were organised at the Centre and other locations in Tamil Nadu.

-- In connection with the environmental education and zoo interpretation programmes at Arignan Anna Zoological Park at Vandaur, the Centre organised training programmes, workshops, exhibitions, etc.

-- The Field Station of the Centre at Ooty, set up in 1990, continued to conduct awareness programmes and eco-development work in and around the Nilgiri Biosphere Reserve.

-- A herbal garden is being established in co-operation with the students and local people of the village of Thampatty.

-- Bokkapuram, a village adjoining Mudumalai is being developed as an eco-model village. A co-operative society has been formed and registered and income-generating schemes such as mushroom cultivation, bee-boxes and tree-nurseries have been initiated.

-- Under the Andaman and Nicobar Conservation Programme, educational resource materials were prepared and workshops for teachers and students were organised.

-- Nine sites in villages of Tamil Nadu have been taken up for restoration of sacred groves: besides organising awareness-raising programmes, soil tests are carried out and suitable saplings are also provided which are planted and maintained by the villagers.

-- Several booklets, pamphlets, posters and flip-charts on environmental themes have been produced in English, Tamil, Hindi and Telugu. An audio-cassette of folk songs with environmental messages has also been prepared.

-- Soil samples from 153 sites and water samples from 23 sites of Tamil Nadu and Andhra Pradesh were collected and analysed.

-- A study of the Sthala Vrikshas--trees sacred to a deity or temple - of Tamil Nadu has been taken up.

-- A Regional Conference on Women and Eco-development was organised during 19-21st January, 1995 in which NGOs from South and South-East Asian Countries, UNESCO and UNIFEM also participated besides those from India.

Centre for Mining Environment (CME), Dhanbad

The Centre for Mining Environment (CME), was established in 1987 at the Indian School of Mines, Dhanbad with the objective of carrying out research and training in the area of mining environment.

The Centre has been taken over by the UGC since April 1994 and the expenditure on salaries of staff and faculty is being met by them. The Ministry of Environment and Forests continues to support the Research and Development activities of the Centre. A Monitoring Committee functioning under the chairmanship of Secretary (E&F) oversees and guides the research work of the Centre.

Fig. 70 Experiment showing the comparision of growth of plants in original pyrite Cinder and amended pyrite Cinder at CME, Dhanbad

During the year, the following research projects/ studies were undertaken by the Centre:

-- Environmental status of Dhanbad town.

-- Population dynamics of Dhanbad District.

-- Time-scale land-use in Jharia coal field

-- Environmental impacts of open cast coal mining in Godavari coalfield.

-- Withering of plants on overburden dumps.

-- Distribution of trace elements in coal mines environment.

-- Noise level in a washery in Jharia coalfield.

-- Noise level studies in a cement plant near Dhanbad.

-- Laboratory pot experiments to assess the feasibility of utilization of land degraded due to washery discharge in the past.

-- Laboratory pot experiments to study the possibilities of using fly-ash in reclamation of degraded land in mining areas.

Other Activities

-- The 2nd National Seminar on Minerals and Ecology was organised in January, 1994 at the ISM, Dhanbad, in which about 130 engineers and scientists participated.

-- The faculty members of the CME published/presented nearly 40 scientific papers in national/international journals/seminars.

-- A total of six executive development programmes of varying durations were organised for mineral industry personnel.

-- The 3-Semester M. Tech programme on Environmental Sciences and Engineering being offered by the Centre has been recognised by the AICTE (All India Council of Technical Education.)

-- The ENVIS Centre on 'Mining Environment' set up at the CME made good progress.

Centre for Ecological Sciences, Bangalore

The Ecological Sciences Research and Training Centre was estabished at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore, in 1983 with the objective of focussing on the ecology and environment of the Western Ghats.

The Centre worked on the following research projects during the year:

-- Long-term impact of human use on vegetation.

-- Wild relative of cultivated crops.

-- Networking to study bio-diversity.

-- Vegetation dynamics in the Nilgiri Biosphere Reserve.

-- Climate history of the Nilgiris.

-- Land use pattern in the Nilgiri Biosphere Reserve.

-- Vertebrate diversity.

-- Analysis of rainfall patterns: appropriate spatiotemporal scales of prediction and relevance to agricultural practices.

-- Cultural diversity in the Indian population.

-- Feasibility survey of micro, mini and small hydel potential in Uttara Kannada district.

-- Contribution to understanding of Indian forestry and climate change.

-- Diversity, abundance and body size of insect communities.

Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore

The Centre was established in 1990 with the major objectives of conducting research and PG level courses on all aspects of ornithology and Natural History of other forms of life.

During the year, 34 acres of land, 24 Kms north-west of Coimbatore has been acquired for construction of a permanent building for the Centre. The building is proposed to be designed by the environment-friendly architect, Mr. Laurie Baker.

Under its project ''Establishment of Salim Ali Nature Club Network for Student Community'', nature clubs have been set up in 35 schools of Coimbatore district. Nature camps. bird watching trips, nature quiz and screening of audio-visual are organised for the club members.

Details of the research activities of the SACON are given in Chapter 7.

National Museum of Natural History

The National Museum of Natural History (NMNH) is an institution devoted to environmental education and creation of conservation awareness among the public. The Museum has several exhibit galleries that deal with biological diversity, ecology and conservation. A Discovery Room for children. an Activity Room for pre-school children, a Bio-Science Computer Room for High School children and a Mobile Museum for outreach activities are among the other facilities and infra-structure developed for promoting environmental awareness among various target groups. The Museum conducts a large number of educational activities all the year round. Temporary exhibitions on relevant themes are also organised from time to time.

A brief report of the activities of the NMNH during the year is given below:

New Exhibits

During the year a number of new exhibits have been added and the gallery on 'Cell--the basic unit of Life' has been rennovated with new exhibits on plant reproduction; an interactive multi-media facility dealing with the structure and functions of the Cell is under preparation.

Temporary Exhibition

The Museum organised a number of temporary exhibitions during the year on various environmental

Fig. 71 A child enjoying a 'hands-on' exhibit at the Discovery Room of the NMNH

themes. Significant among these are an exhibition on 'Biodiversity in India' at Mahim Nature Park, Bombay; an exhibition on 'Biodiversity' at the NMNH and an exhibition on 'Publications and Resource Material on Environment' in Parliament House Annexe, New Delhi. On the occasion of the Official Level Consultation among SAARC ASEAN and other countries, held during August, 1994 at Bangalore; an exhibition on 'Biodiversity' was organised at the Indian Institute of Science, Bangalore.

An exhibition on 'Sustainable Development' was organised in the theme pavilion during the Indian International Trade Fair at Pragati Maidan. New Delhi from 14th November to 27th November, 1994, depicting the rich biological diversity of the country emphasising that conservation of bio-diversity is essential for sustainable development. The NMNH was awarded a 'Gold Medal' by the ITPO for this Exhibition.

Educational Activities

Educational activities of the NMNH consisted of a number of special programmes and activities aimed at creating environmental awareness among various target groups. These included:

- A month-long Summer Programme for Teenagers in May-June, 1994 on 'Exploring the Environment' consisting of inhouse and outdoor activities, nature camps, etc.
- A month-long Summer Programme for children on Nature Painting and Animal/Plant Modelling.
- A special week-long programme for handicapped children including the blind, deaf and dumb, mentally retarded and physically handicapped.
- A new programme designed for students from different schools named 'LEARN' (Lesson on

Environmental Awareness and Resources at NMNH).

-- Teacher Orientation Workshops for teacher-trainees on the production and use of environmental education resource material.

-- Interactive programmes and games for children on Dinosaurs. Food Chain and Food Web. 'Who am I? Animal or Bird' etc.

-- Collaboration with NCSTC-Network in conducting slogan writing and poster designing competitions for children and teenagers.

-- Special programmes like quiz and declamation contests, teacher orientation, study tours to wildlife sanctuaries, etc., during November/December, under the 'National Environment Awareness Campaign'.

Collaboration with University of Delhi

A mongh-long course on 'Environmental Education' was organised at the NMNH for the students of B.Sc. (Environmental Science) of the Delhi University. Classes were also conducted at the Museum for M.Sc. (Environmental Science) students of the Delhi University.

Mobile Museum

The Mobile Museum was used for various outreach activities at Dehradun, Meerut and Kota; it also visted several schools and community centres in and around Delhi during the year. Mobile Exhibition participated in a Conference on ''Nature and Environment' at Defence Officers' Institute,Dhaula Kuan, New Delhi in April, 1994.

Professional Enrichment, Participation in Seminars/ Workshops, etc.

-- Under the Indo-US Museum Partnership programme of the Indo-US Sub-commission on Education and Culture two officials were deputed for a month for professional enrichment at the Field Museum of Natural History Chicago followed by study visits to museums in Washington D.C. and New York. In exchange two Museologists from Field Museum of Natural History, Chicago visited India and worked with the shaft of the Regional Museum of Natural History, Mysore for a similar period.

-- Two senior officers, one each from NMNH, New Delhi and RMNH, Mysore were deputed for attending a course on 'Museum Management' at the Administrative Staff College, Hyderabad.

-- The Director NMNH, participated in international and national seminars and conferences relevant to Natural History Museums and presented scientific papers.

-- A workshop on ''Techniques of Diorama Making'' was conducted at the NMNH in collaboration with the Natioinal Science Centre, New Delhi under the auspices of INC-ICOM.

Regional Museum of Natural History

Exhibit and infrastructural development at the Regional Museum of Natural History, Mysore made considerable progress during the year. A large number of Natural History collections and exhibits from the State Museums at Bangalore,Mangalore, Gulbarga and Shimoga in Karnataka were transferred to RMNH, Mysore by the Govt. of Karnataka. Significant progress was made in the construction of a building for the RMNH, Bhopal, The Foundation Stone for a building for the RMNH, Bhubaneshwar was laid by the Hon'ble Minister for Environment and Forests in November, 1994.

Fellowships and Awards

Indira Gandhi Paryavaran Puraskar (IGPP)

Instituted in 1987, this award is now being presented to an individual and an organisation every year for significant contribution in the field of environment. Each award carries a cash component of Rs. one lakh, a silver trophy, a scroll and a citation.

At a function organised at the Rashtrapati Bhawan on 6.8.94, the awards for 1992 and 1993 were given away by the Hon'ble President of India to the following individuals and organisations.

1992	--	Dr. K. Sivarama Karanth, Karnataka.
	--	127, Infantry Battallion, Dehradun Cantonment.
1993	--	Dr. T.N. Khoshoo, New Delhi.
	--	Young Mizo Association, Mizoram.

About 200 nominations from various individuals and organisations have been received for the award for 1994 and these are being considered.

Fig. 72 Nursery raising by the children of Chandrapur Girls' High School (Primary Unit), Tripura - IPVM awardee for the year 1991

Indira Priyadarshini Vrikshamitra Award (IPVM)

The Annual Indira Priyadarshini Vrikshamitra (IPVM) Awards were instituted in 1986 to recognise pioneering and exceptional contribution of individuals and organisations in the field of afforestation and wastelands development. Since, 1988, ten awards of Rs. 50,000/- each in cash with medallions and citations are given annually under five categories viz; (a) individuals, (b) Panchayats/Gram Sabhas/ village level institutions, (c) Educational Institutions, (d) Volunatry agencies including Mahila Mandals, Yuvak Mandals etc., and (e) Government Agencies (District level and below). A sixth category of corporate Sector has been included from 1993. IPVM Awards upto 1991 have already been presented and the awards for 1992 are being finalised. The Awards for 1993 are under process.

Mahavriksha Puraskar

The Mahavriksha Puraskar instituted during 1993-94, recognises individuals/organisations for having trees of the notified species on the basis of girth, height, health and vigour of the trees. A roster of notified tree species, valid for five years has been prepared. The Award consists of a cash price of Rs. 25,000/-, a plaque and a citation. Nominations for the first award have been invited, and a Selection Committee has also been constituted for selecting the awardees.

National Award for the Prevention of the Pollution

Since 1991, a scheme of National Award for the Prevention of the Pollution has been initiated to encourage industries and operations to take steps for prevention and

control of pollution. The Award consists of a trophy and a citation and a total of 18 awards shall be given away each year to deserving industrial units one in each of the highly polluting industries listed below:

-- Sugar

-- Fertiliser

-- Cement

-- Fermentation and Distillery

-- Aluminium

-- Petro-chemicals

-- Thermal power

-- Caustic-soda

-- Oil refinery

-- Sulphuric Acid

-- Tanneries

-- Copper smelting

-- Zinc smelting

-- Iron and Steel

-- Pulp and Paper

-- Dye and dye intermediate

-- Pesticides

-- Pharmaceuticals

Besides this five more awards will also be given to small scale industries in the following categories.

-- Tanneries

-- Pulp and paper

-- Dye and dye intermediates

-- Pesticides

-- Pharmaceuticals

A High level Technical Committee under the Chairmanship of Secretary (E&F) selects the awardees and the following industrial units were selected for this award for the year 1992-93.

-- M/s. Rashtria Chemicals and Fertilisers Limited, Thal, Maharashtra.

-- M/s. Century Cements, Baikunth,Raipur, M.P.

-- M/s. Indian Drugs and Pharmaceuticals, (IDPL), Rishikesh., U.P.

The Awards were given by Hon'ble President of India on 6.8.1994 at New Delhi.

Rajiv Gandhi Environment Award for Clean Technology

This Award initiated in 1993, is given away to industrial units that have made significant and measurable contributions towards development of clean technologies and innovative solutions to environmental problems created by industrial operations. The Rajiv Gandhi Environment Award for Clean Technology for the year 1992 was awarded to M/s. Rashtriya Chemicals and Fertilisers Ltd., Thal, by Smt. Sonia Gandhi, on 19.8.1994.

Pitambar Pant National Environment Fellowship Award

This annual fellowship was instituted in 1978 in order to recognise, encourage and support excellence in any branch of research related to environmental sciences. The fellowship for the year 1994 has been awarded to Dr. M.P. Nayar in recognition of his valuable scientific contributions in the area of biodiversity, taxonomy, species endemism and endangered flora. During the tenure of the fellowship, Dr. Nayar will work on the project entitled "Hot Spot of plant diversity and ecologically sensitive area in India".

This award carries a monthly fellowship of Rs. 4000/- for two years, a contingent grant of Rs. 18,000/- per annum and other facilities.

B.P. Pal National Environment Fellowship Award for Biodiversity

Recognising the importance of the subject of Biodiversity and with a view to further develop and strengthen the expertise available in the country, the Government of India has instituted a National Fellowship in the area of Biodiversity. To invest the fellowship with a high standard and also to commemorate the extra-ordinary contributions of Late Dr. B.P. Pal in this field, the award has been named after Dr. B.P. Pal.

The fellowship is in recognition of significantly important research and development contributions and is also intended to encourage talented individuals to devote themselves whole time to R&D pursuits in the field of Biodiversity for the duration of the fellowship.

The fellowship would normally be for a period of two years, and may be extended by one more year in exceptional cases. Under the schemes, one award will be given annually based on the recommendations of the Award Committee to be constituted for the purpose. The Ministry of Environment and Forests will be the implementing agency. The award would be announced on 5th of June every year which is the World Environment Day. The Scheme would become operational from 1995.

Environmental Information

Environmental Information System (ENVIS)

The ENVIS Network at present consists of 20 subject specific nodes, known as ENVIS Centres, located in various institutions throughout the country, besides the Focal Point in the Ministry. The Network continued its activities in information collection, collation, stroage, analysis, retrieval and dissemination to all concerned. A list of all the ENVIS Centres alongwith their subject areas is given at Annexure V. The Focal Point of ENVIS and its network partners laid emphasis on the development of the information base through creation of relevant databases in their concerned subject areas. The major activities of the ENVIS Focal Point and its various Centres during the year are as follows:

Focal Point

-- The ENVIS Focal Point in the Ministry continued to strengthen its information base through acquisition of

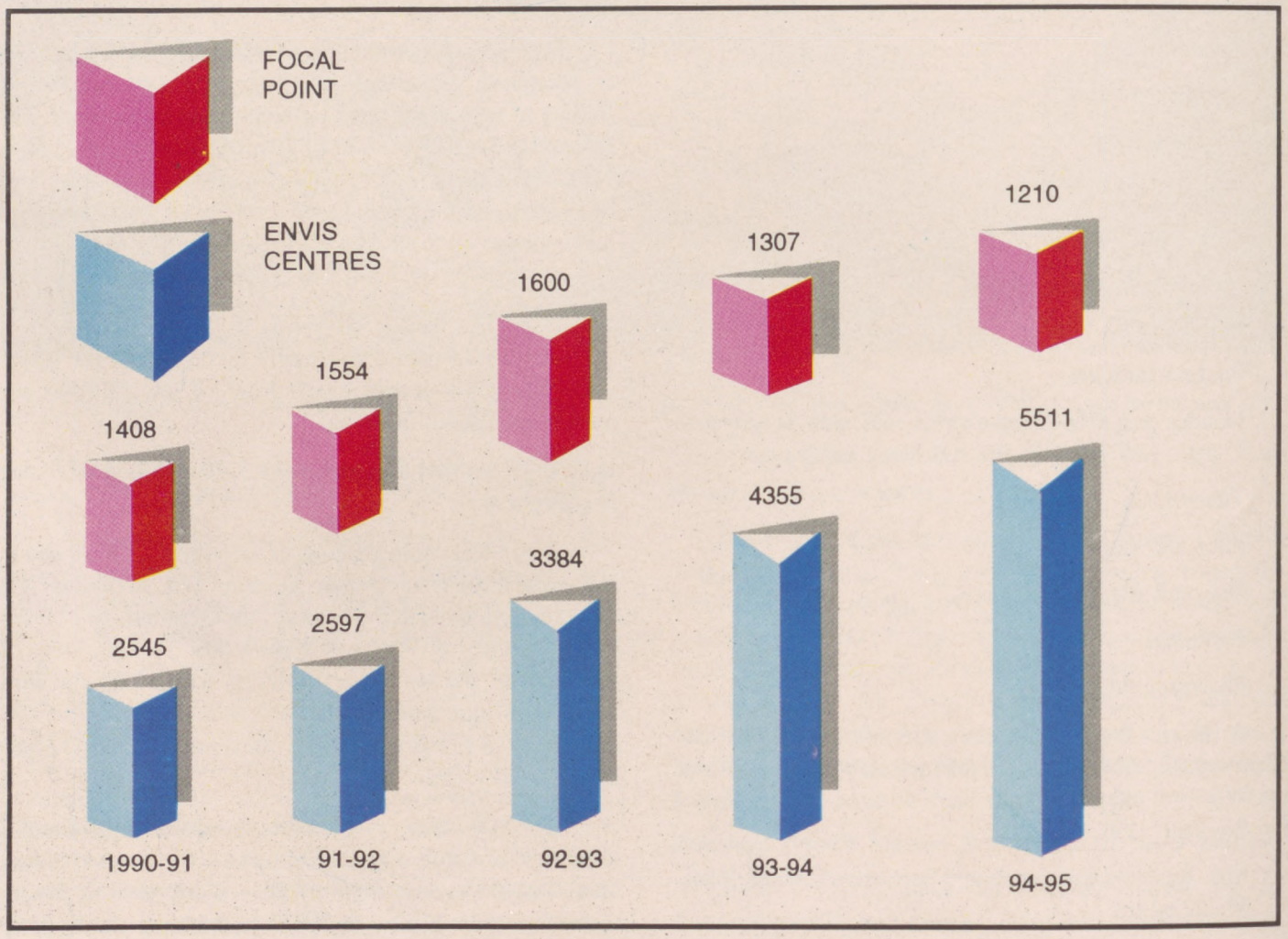


Fig. 73 No. of queries responded by ENVIS

relevant publications, reports, bibliographies, journals, monographs,,State-of-Art report etc., on several aspects of environment and its related areas. The information base was also enriched by the documentation support provided by all the Network partners in the subject areas assigned to them.

-- The Library in the Ministry is an integral component of ENVIS and acts as document repository for dissemination of information in the field of Environment, Forests and Wildlife and other associated areas. During the year, the Library enriched its collection through the procurement of substantive information resources in the relevant fields. At present it has a collection of about 20,000 documents including books, scientific and technical reports etc., and receives over 200 national and international journals/magazines regularly. The Library thus provides backup support to the ENVIS to disseminate information of substantive nature to its user groups.;

In order to expedite the retrieval and dissemination of information, automation of the Library has been initiated during the year. The necessary hardware for this purpose has been installed and the software development/procurement initated.

During the year more than 300 scholars from various Institutions in Delhi made use of the Library in the

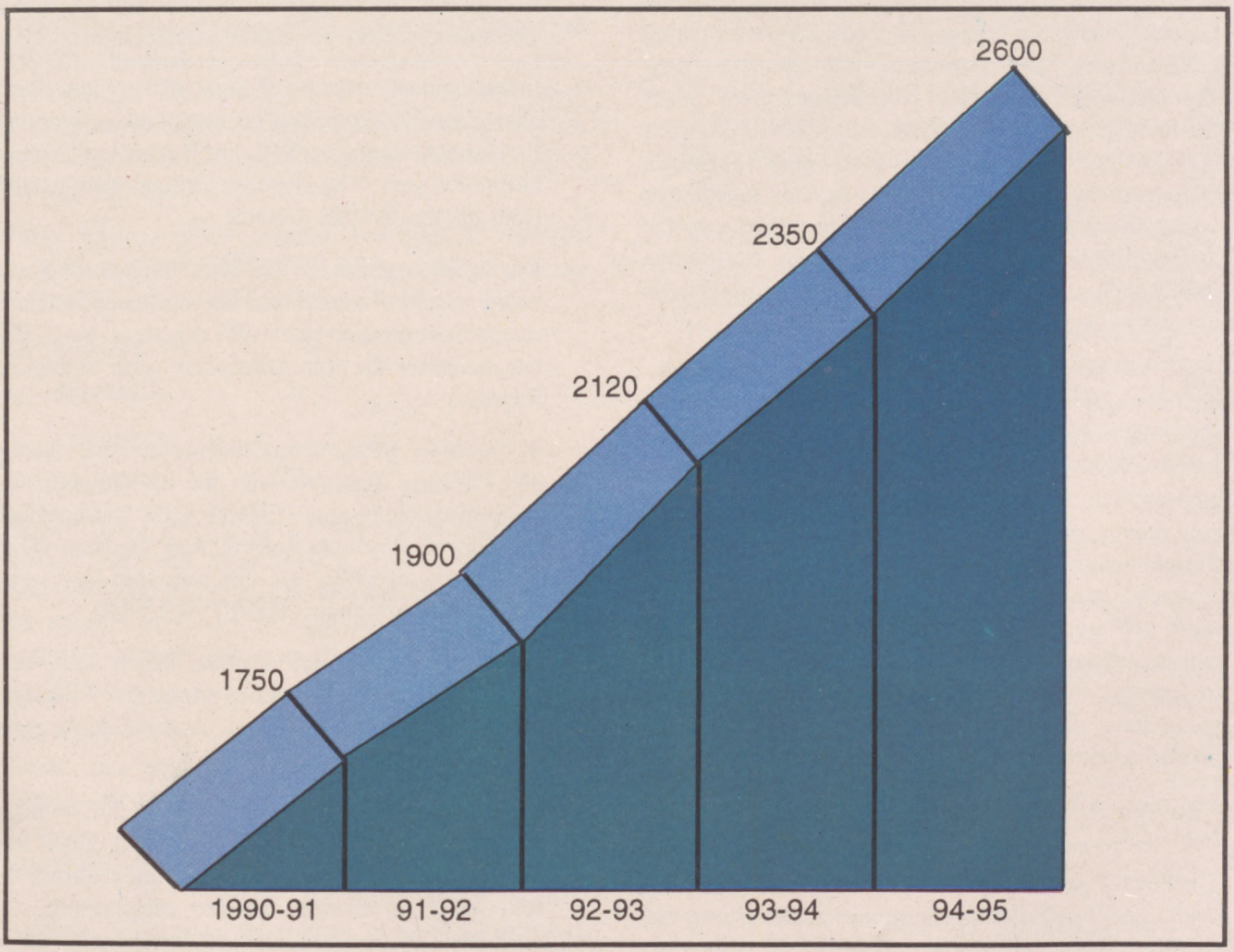


Fig. 74 'Paryavaran Abstracts'-a users' profile

Ministry. The Library is also equipped to provide reprographic services not only to the ENVIS users but also to various divisions of the Ministry. Apart from technical books and journals/magazines, Library also procured a wide range of general books, magazines, newspapers etc., both in English and Hindi for use of the officials of the Ministry and its agencies.

-- ENVIS also continued as the National Focal Point (NFP) and Regional Service Centre (RSC) for the South Asia Sub-Region for INFOTERRA Network of United Nations Environment Programme (UNEP).

During the year, ENVIS responded to 6721 queries out of which 905 were international and the remaining were national. The ENVIS Focal Point alone responded to more than 1200 national and international queries during the year. The major areas on which the queries were received pertained to subjects such as pollution control, renewable energy, soil conservation, mining environment, environmental management, bio-degradation of wastes etc. The detailed break up of the number of queries processed by ENVIS Network during the last five years is given in figure 73. Efforts were made by ENVIS Network to provide substantive information to all the queries mentioned above as far as possible but in some cases where substantive information was not readily available, referral services were provided to the users.

-- The Focal Point also continued to publish the quarterly abstracting journal known as 'Paryavaran Abstracts' reporting information on environmental research in Indian context. More than 600 national and international environment related journals are referred to in the compilation of the various abstracts for inclusion in this publication. Relevant abstracts are arranged under 12 major categories like air pollution, water pollution, noise pollution, ecology, environmental management, nature and natural resources conservation, health and toxicology, forestry, wildlife, energy etc. A subject index have also been appended to the journal for precise retrieval of information.

The user profile of Paryavaran Abstracts is given at figure 74.

-- The Focal Point also continued its activities for setting up of new ENVIS Centres on subject areas not covered so far, in order to make the ENVIS Network comprehensive. During the year, one new ENVIS Centre on Bio-geochemistry and Environmental Law was set up in the School of Environmental Studies, Jawahar Lal Nehru University, New Delhi, and the ENVIS Centre on 'Eastern Ghats' located earlier in Andhra University was relocated at Environmental Protection Training and Research Institute (EPTRI), Hyderabad. A few more areas have also been identified by the Scientific Advisory Committee of ENVIS for setting up of such centres in phases. With a view to enhancing the scope of ENVIS in accessing available infomation at various scientific and research institutions, educational and other organisations of the country and to link up all the ENVIS Centres with the Focal Point and with each other, networking of all the ENVIS Centres is being made through ERNET Programme of the Department of Electronics DEO, in a phased manner so that the Centres could communicate through E-mail and access various national and international databases in their concerned subject areas.

In this connection the Focal Point also organised a three days intensive workshop on computer networking at the National Centre for Software Technology, Bombay, during the year, The same was attended by personnel from all the ENVIS Centres.

-- During the year, the ENVIS Focal Point in the Ministry coordinated the International Photographic Competition on the Environment (1994-95) organised by UNEP to commemorate the 50th Anniversary year of the United Nations.

-- In view of the infrastructure, and professional experience and expertise available with the ENVIS, efforts are being made to designate ENVIS as the National Centre for Global Resource Information Databse (GRID) Programme of UNEP and Substainable Development Network Programme (SDNP) of UNDP.

-- ENVIS also continued its close liasion with various other National Information Systems for exchange of environmental information and to avoid duplication of efforts in the concerned fields.

-- During the year a "Handbook of Environmental Procedures and Guidelines" containing details about the environmental procedures that are required to be followed by a potential investor while setting up an investment project has been produced by the ENVIS Focal Point.

Activities of the ENVIS Centres

During the year all ENVIS Centres continued their activities in information collection, storage, retrieval and dissemination in the subject area assigned to them. Apart from strengthening the information base and responding to various national and international queries in their respective subject areas, all the ENVIS Centres undertook a variety of activities with the ultimate objective of providing information to a wide range of users. Highlights of some of the activities of these ENVIS Centres are given below:

-- The ENVIS Centre at Central Pollution Control Board (CPCB), New Delhi, continued to publish the Quarterly Newsletter "Parivesh" in Hindi. Various other documents and bibliographies in the concerned areas were also brought out by the Centre.

-- The ENVIS Centre at National Institute of Occupational Health, Ahmedabad, prepared monographs on Acetone, Aluminium, Carbon-di-sulfide, cypernathrin and Nitrobenzene. Safety cards on Aluminium, Cypernathrin and Carbamate (Baygon) were also been prepared during the year.

Four bibliographies covering outcome of research carried out in India have been prepared on the following areas by the Centre:

-- Silicosis

-- Asbestosis

-- Byssinosis

-- Aluminium

-- The ENVIS Centre at Tata Energy Research Institute, New Delhi, was connected by E-mail through the ERNET Programme and is now capable of accessing the databases of over 250 Educational and Research Institutes in the country. It also continued to publish its journal viz.; the Energy Environment Monitor.

-- The ENVIS Centre of Estuaries, Mangroves, Coral Reefs and Lagoons functioning at Annamalai University, Parangipettai, acquired the 'Aquatic Sciences and Fisheries Abstracts' in CD form and accumulated information to the tune of 4,25,000 abstracts. The Centre has scanned and stored pictures of over 200 species of prawns, corals and finfishes in the computer. Besides the ENVIS Newsletter, the Centre has published Marine faunal lists, Marine environmental glossary and details of estuaries and lagoons of India.

-- The ENVIS Centre at the Central Arid Zone Research Institute, Jodhpur has also been hooked to the ERNET and has a E-mail address now. Creation of database on "Desertification and Soil Science" using CDS/ ISIS Software package has been completed.

-- The ENVIS Centre at National Environmental Engineering Research Institute, Nagpur, concentrated on information resource development, bibliographic information, organisation information consolidation and repackaging besides query response service and information dissemination. The Centre has acquired many of the national and international databases and software packages pertaining to solid and hazardous waste management.

-- The ENVIS Centre on "Human Settlements" at the School of Planning asnd Architecture at New Delhi is collecting data on various themes such as urban climate, land use, energy, traffic and transportation, air pollution, slums etc., for 23 metropolitan cities of India.

-- The ENVIS Centre at World Wide Fund for Nature-India, brought out the sixth edition of the Directory of Environmental NGOs in India. The Directory of 'Audiovisuals on the Environment' and the 'Directory of Indian Expertise in Environment Science' are being revised and updated. Computerisation of the index relating to the questions and answers on environment handled by both the Houses of Parliament upto 1993 has been completed.

-- The ENVIS Centre on "Himalayan Ecology" functioning at the G.B. Pant Institute of Himalayan Environment and Development, Kosi (Almora) procured the sub-components of the Archival Information System that is being set up at the Centre and collection of data related to Himalayan Ecology was continued.

-- The ENVIS Centre on Plant Ecology at the Botanical Survey of India has installed the necessary hardware for information storage and retrieval. During the year, the first issue of the ENVIS Newsletter was brought out.

-- The ENVIS Centre on Bio-geochemistry and Environment Law established at the School of Environmental Sciences, Jawaharlal Nehru University,

New Delhi, started functioning from July, 1994. Database development has been initiated and 500 references in Bio-geochemistry and about 40 references in Environmental Law have been entered in the computer so far.

-- The ENVIS Centre on Animal Ecology, functioning at the Zoological Survey of India, Calcutta, developed application software for storage, retrieval and dissemination of data on Animal Ecology. The information on 153 endangered species of vertebrates collated by the ENVIS Centre has been published as the "Red Data Book on Indian Animals" which was released by the Hon'ble Minister for Environment and Forests in August, 1994

-- The ENVIS Centre on 'Eastern Ghats' functioning earlier at the Andhra University has been relocated at the Environment Protection Training and Research Institute (EPTRI), Hyderabad, during the year and has started functioning from April 1994. The Centre has initiated work on the development of GIS based Environmental Mapping of the Eastern Ghats as well as building up of a resources base on published sources relevant to the subject areas.

-- Besides its usual activities relating to information collection and dissemination, the ENVIS Centre at the Industrial Toxicology Research Centre, Lucknow, prepared toxicity data sheets on 45 chemicals during the year. The Centre now has computerised chemical profiles of 355 chemicals. An illustrated pamphlet in Hindi on the safe use of pesticides has also been brought out.

-- The ENVIS Centre at Development Alternatives continued to offer information services to a wide range of users. It also continued to publish the Newsletter giving an information package in the subject area during the year.

-- The ENVIS Centre at Anna University, Madras, continued to publish the ENVIS Newsletter, list of current literature, journal abstracts and thesis abstracts in the two areas allotted to it.

-- The ENVIS Centre on Environmental Problems of Mining at Centre for Mining Environment, Indian School of Mines, Dhanbad, organised the First ENVIS Workshop at Indian School of Mines during the year to apprise the users of the various services offered by the ENVIS Centre. Publication of the ENVIS Newsletter has also been initiated.

-- The ENVIS Centre at Centre for Ecological Sciences, Bangalore continued to enrich the information repository by procurement of documents, reprints, journals etc., in the relevant field and responded to about 250 queries during the year pertaining to various aspects of the Western Ghats ecology.

9

LEGISLATION AND INSTITUTIONAL SUPPORT

Legislation

Since the enactment of the Environment (Protection) Act, 1986, several actions have been taken by the Ministry of Environment and Forests to create comprehensive legal and institutional infrastructure for safeguarding the environment. These include framing of rules, notification of standards, notification of environmental laboratories, delegation of powers, identification of agencies for hazardous chemicals management, setting up of Environmental Protection Councils in the States etc.

The notification making Environmental Impact Assessment statutory for 29 different activities, issued on 27th January, 1994, has been amended during the year and the amended notification was issued on 4th May, 1994. The amended version includes a self-explanatory note intended to facilitate the submission of applications complete in all respects by the project proponents.

- Based on the recommendations of the Expert Committee set up to examine issues relating to tourism and hotel facilities in coastal areas, the Coastal Regulation Zone (CRZ) notification has been amended. The amended notification has been issued on 16.8.94.
- Effluent and emission standards for the following 11 categories of industries have been finalised for notification under the Environment (Protection) Act, 1986.
  - starch industry (maize products)
  - beehive hard coke oven
  - briquette industry (coal)
  - soft coke industry
  - edible oil and vanaspati industry
  - organic chemicals manufacturing industry.
  - flour mills
  - boilers (small)
  - pesticide industry
  - oil drilling and gas extraction industry
  - pharmaceutical industry
- The National Ambient Air Quality Standards have also been finalised for notification under the Environment (Protection Act), 1986.

The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, have been amended and notified. Details are given under chapter 5.

The Hazardous Wastes (Management and Handling) Rules, 1989, are being amended.

The Rules for Handling and Management of Bio-Medical Wastes have been finalised and are being vetted for notification.

Legal action against polluting industries

The Central and State Pollution Control Boards and the Pollution Control Committees are responsibile for taking legal action against polluting units in their respective State under the Water and Air Acts. The State-wise information regarding the number of cases filed by the CPCB, SPCBs and PCCs is compiled and analysed on a quarterly basis at the Ministry.

As on 31st Octobeer, 1994, a total of 6133 cases have been filed by the CPCB/SPCBs under the Water and Air Acts. Out of these, 2635 cases have been decided and 3498 are pending in various courts.

Institutional Support

The scheme of providing financial assistance to the State Pollution Control Boards for technical man power and procurement of scientific equipment and to the State/UT Department of Environment for additional technical man power was continued during the year. An amount of Rs. 2.00 crores has been disbursed to the SPCBs and the State/UT Departments of Environment.

10

INTERNATIONAL COOPERATION

Introduction

The Ministry of Environment and Forests is the nodal agency in the country for United Nations Environment Programme (UNEP), Nairobi, South Asia Cooperative Environment Programme (SACEP), Colombo, International Centre for Intergrated Mountain Development (ICIMOD), Kathmandu and the International Union for Conservation of Nature and Natural Resources (IUCN). Annual financial contributions are made to these Organisations. The ministry also functions as the nodal agency for participation in international agreements relating to environment such as the Convention on International Trade in Endangered Species, Convention on wetlands of International importance, especially on waterfowl habitat, Convention on the Conservation of Migratory Species of Wild Animals, Vienna Convention for the Protection of the Ozone Layer, Montreal protocol on Substances that Deplete the Ozone Layer, Conventions on Biological Diversity and Climate Change, the Basel Convention on Trans Boundary Movement of Hazardous Substances, etc.

Implementation of Agenda 21

India is actively participating in the global debate on the implementation of Agenda 21. At the Second Session of the Commission on Sustainble Development (CSD) held in New York during 16-17th May, 1994, India has been elected to the Bureau of CSD as vice-chairman representing Asia. Apart from reviewing the Cross-sectoral themes of Agenda 21, notably financial resources and mechanisms, transfer of environmentally sound technologies, role of major groups, decision-making structures, consumption and production patterns, etc., the commission also received specific themes of health, human settlements, fresh water, toxic chemicals and hazardous wastes. At a major Workshop entitled : "Towards Sustainable Forestry : preparing for CSD 1995" jointly sponsored by India and the U.K., in New Delhi in July, 1994, a draft framework has been prepared for providing national information to the CSD 95.

India was represented at the negotiations that adopted the final text of the Convention to Combat Desertification. The Convention has been signed on 14th October, 1994. More details regarding this convention are given in Chapter-3.

Since ratifying the Basel Convention in March, 1992, India has been actively participating in finalising the technical guidelines for various categories of hazardous wastes as identified in the convention.

Global Environment Facility (GEF)

At a meeting of the Participants Assembly, held during 14th-16th March, 1994, at Geneva an agreement has been reached on the restructuring and the replenishment of the Global Environment Facility (GEF). With this Agreement, donor countries have pledged a total of slightly over $ 2.0 billion towards replenishment of the GEF. The four focal areas of GEF are-Climate Change, Biological Diversity, International Waters and Ozone Layer Depletion. The agreement on the restructured GEF also envisages funding for activities concerning land degradation, primarily desertification and deforestation as they relate to the four focal areas.

A State of Environment Report is being prepared by the ESCAP for Asia and Pacific Region. The Ministry of Environment & Forests is coordinating India's contribution to this Report.

Ozone Layer Protection

Inspite of the adoption of the Vienna Convention in 1985 and the Montreal Protocol in 1987 and other global efforts to Protect the ozone layer, ozone levels in the stratosphere continue to decrease as ODS (Ozone Depleting Substances) are still being used in refrigeration and air conditioning, preparation of foam and spray products, fire extinguishing and as solvents in electronics and other industries.

During the year several steps have been initiated to phase out ODS as scheduled in India's Country programme on the phasing out of ODS. A comprehensive survey of small scale and informal sector industries using ODS has been undertaken. Sector-wise strategies are proposed to be developed for halon, foam and producer sectors.

Two workshops on project preparation and training of local consultants were held. Consultants of implementing agencies visited India to assist enterprises in finalisation of their project proposals. Information on Montreal Protocol was disseminated to interested persons and enterprises. Meetings with industry and industry associations were held. Thirty projects have been approved for funding by the Multilateral Fund set up under the Montreal Protocol. Bilateral cooperation with the Governments of Germany and Switzerland have been arranged for pilot production of domestic refrigerators using hydrocarbons as refrigerants.

India participated in the XII-XV meetings of the Executive Committee, X Meeting of the Open Ended Working Group and the VI meeting of the Parties to the Montreal Protocol. At the XIV meeting of the Executive Committee a joint proposal of India and the World Bank has been approved by which proposals costing less than US $ 500,000 would be approved expeditiously. An amount of US $ 4 million has been earmarked for the pilot phase.

India has been elected co-chairman of the Open Ended Working Group for the year 1995. India has also been selected as a member of the Sub-committee Supervising Review under Article 5, paragraph 8 and member of the Steering Panel Supervising Review of the Financial Mechanism of the Montreal Protocol and has made important contributions to the deliberations of these Committees.

India-Canada Environment Facility (ICEF)

A Joint Project Steering Committee (JPSC) of ICEF has been set up with Additonal Secretary (IC) as Chairman and representatives of MOEF, DEA and the Canadian High Commission as members. The JPSC will select the projects for funding under ICEF. An amount of Rs. 55 crores is expected to be received by the Government of India under ICEF in the financial year 1994-95.

Multilateral and Bilateral Programmes

The Ministry and its agencies received assistance from various countries like Sweden, Norway, Denmark, Australia, U.K. etc., on bilateral basis and from several UN and multilateral agencies like UNDP, World Bank, Asian Developmet Bank, OECF (Japan), ODA (UK). Various multilateral and bilateral programmes in Forestry and Environment Sectors are as follows:

Multilateral Programmes

Forestry Sector

A number of Forestry projects are being implemented in various States with assistance from external donor agencies like the World Bank, SIDA (Sweden), OECF (Japan, EEC, ODA (UK), GTZ (Germany) etc. The external assistance for such projects is received by the Ministry of Finance 9Department of Economic Affairs) which passes on such assistance to the concerned States as and when reimbursed by the external funding agency, in the form of additional Central assistance.

- Nine externally aided social forestry projects have been completed so far in the States of Maharashtra, Andhra

Pradesh, Bihar, Haryana, Jammu and Kashmir, West Bengal, Kerala, Karnataka, Uttar Pradesh, Himachal Pradesh, Rajasthan, Orissa and Gujarat at a total cost of Rs. 1246.89 crores. The list of these projects is given at Annexure VI.

- At present twelve forestry projects in seven States are being implemented with financial assistance from the World Bank, SIDA, EEC, OECF (Japan), ODA (UK) and GTZ (Germany) with a total provision of Rs. 253.22 crores for 1994-95.
- Seven more projects are in the pipeline and 10 projects are at various stages of processing. The list of these projects are given in Annexure VII & VIII.

Environment Sector

World Bank

Phase I of the World Bank Aided Industrial Pollution Control Project, started from 1991, continued during the year and is expected to be completed by the end of the Eighth Five Year Plan. This project involves a line of credit of US $ 155.6 million and a counterpart fund of US $ 108 million to be provided by the Government of India, State Governments, Financial Instiutions such as IDBI and ICICI and by the industrial units availing the loan. The major components of the project alongwith their activities are as follows:

Investment Component

Major activities under this component are: (a) provision of loans to large and medium industries for installing pollution control equipment, (b) establishment of CETPs for clusters of small scale units, and (c) establishment of demonstration projects for introducing energy and resource conservation measures in small and medium scale sectors.

During the year a sum of US $ 100 million have been provided as soft loan to medium and large scale industries and establishment of about 35 CETPs have been approved by the Ministry, out of which term loans have been sanctioned to 15 CETPs by the IDBI. The others are under process. One demonstration project of M/s Shiva Papers has been approved during the year.

Institutional Development Component

This component is designed to strengthen the monitoring and enforcement abilities of the Pollution Control Boards of four industrialised State viz., Gujarat, Maharashtra, Tamil Nadu and Uttar Pradesh. A sum of Rs. 36 crores has been provided for this component which includes acquisition of equipment, refurnishing of laboratory facilities and training of personnel.

The Government of India and the World Bank have approved Phase II of this project also, which will start from the next financial year. The total outlay of Phase II of the Industrial Pollution Prevention project is about US $ 330 million and involves a line of credit of US $ 168 million and counterpart fund of US $ 162 million to be provided by the Govt. of India, State Governments, Financial Institutions and the industrial units availing the loan.

UNIDO

Major projects being implemented with assistance from UNIDO are as follows:

- Training of trainers in environmental auditing.
- Areawise Master Plan for environmental quality management, Dhanbad.
- Clean technology for identified small scale industries.

The following projects have been approved by the Ministry of Environment and Forests for UNIDO support:

- Environmental audit approach for industrial pollution control in the clusters of small scale industrial units and critically polluted areas in India.
- Applications of biotechnologies for treatment and disposal of wastes, especially the toxic and hazardous wastes in India.
- Establishment and upgrading of industrial units for manufacture of eqipment and instruments for pollution control environmental monitoring.
- Environmental decision support system for atmospheric air pollution simulation and control.

Bilateral Programmes

- The Environmental Protection, Training and Reserach Institute (EPTRI) set up at Hyderabad is being upgraded with financial assistance from the Swedish Government under the Indo-Swedish Bilateral Cooperation Programme. The State Government of Andhra Pradesh will be meeting the recurring expenditure of the Institute.

- Norway is providing financial assistance to the Pollution Control Boards of U.P. and Orissa for monitoring the fluorine emission from INDALCO and NALCO respectively. The staff of these two PCBs are also being trained by NORAD.

- An environmental Master Plan Study Project for the South Kannara district has been approved for assistance from Denmark, the objective of which is to facilitate integrated management of natural, human and economic resources of the district by the year 2005.

- A project on "Waste Management Technology for Hussain Sagar, Hyderabad" has been approved for assistance from Australia. The Austrialian Government is appointing the contractors for drawing up the detailed engineering design for the project.

- Two projects on Environmental Training Institutes in Tamil Nadu and Karnataka are being assisted by Denmark.

- An Industrial Pollution Control Project for Madhya Pradesh similar to the World Bank aided one, has been approved by the Government of India for assistance from NORDIC agency. Final approval of NORDIC agency is awaited.

Other Activities

- Mr. John Gummer, Environment Minister of the U.K. visited India in July, 1994, and bilateral discussions were held.

- Dr. Klaus Topfer, Minister for Environment of Germany also visited India in July, 1994, and held bilateral discussions on environment matters.

- During the visit of Ms. Hazel O' Leary, US Secretary of Energy to India in July 1994, a Join Statement on "Energy Enhancing Technologies" has been signed by the Ministry of Environment and Forests with the U.S. Energy Department.

- During the recent visit of the Prime Minister to Moscow in June 1994, a Memorandum of Understanding in the field of Environment has been signed with Russia.

- Mr. Roy Maclaren, Canadian Minister for Trade met the Minister for Environment and Forests in October, 1994, and held bilateral discussions.

-- The Minister for Environment and Forests participated in the Second Session of the Commission on Sustainable Development (USA), Conference of Parties to Montreal Protocol, Conference of Parties to Convention on Biological Diversity, and the signing Ceremony of UN Convention on Desertification. The Minister also participated in the Conference organised by UNCTAD on Trade and Development in Geneva.

11

ADVISORY INPUTS, ADMINISTRATION, PLAN CO-ORDINATION AND BUDGET

Advisory Inputs

National Environmental Council

The National Environmental Council, constituted under the Chairmanship of the Prime Minister, is meant to act as a 'think-tank' on important environment policy matters and also to provide planning and other inputs in an advisory capacity on issues and matters which may be placed before it by the Ministry of Environment and Forests. The recommendations of the Council shall be advisory in nature and will be made to the Ministry of Environment and Forests.

The Council consists of Environment Ministers of State/Union Territories, Members of Parliament, Captains of Industry, prominent NGOs, Scientists and Environmentalists of international stature, heads of various leading scientific and research institutions, Secretaries of various key Ministries etc.

The first meeting of the National Environmental Council was held on 25.4.1994 under the Chairmanship of the Prime Minister wherein it was decided to have periodical meetings of the Council in future.

Administration

The strength of the Ministry including the National Afforestation and Eco-Development Board (NAEB) and the Ganga Project Directorate (GPD) at the Headquarters is 1123 (Group 'A' 236, Group 'B' 349, Group 'C' 305 and Group 'D' 233).

Personnel Policies

Under the Flexible Complementing Scheme, 89 Group 'A' Scientific Officers were reviewed and 72 were graded fit for promotion to the respective higher grades.

Reservation in service

A statement showing the reservation of posts for Scheduled Castes/Scheduled Tribes in the Ministry is given at Table 10.

IFS Cadre Management

The Ministry of Environment and Forests is the ''Cadre Controlling Authority'' for the Indian Forest Service, which is an All India Service. The Service consists of 21 cadres including three joint cadres namely the Assam-Meghalaya, the Manipur-Tripura and the Arunachal Pradesh-Goa-Mizoram Union Territories (AGMUT) Joint Cadre. The existing stength of the IFS is 2733.

Table-10

Sl. No.	Name of Post	No. of posts sanctioned	No. in position	SC employees	Percentage to the total no. of employees in position	ST employees	Percentage to the total No of employees in position
1.	Group 'A'	236	200	14	7	10	5
2.	Group 'B'	349	284	22	7.74	06	2.11
3.	Group 'C'	305	257	56	21.78	22	8.56
4.	Group 'D' (excluding Safaiwala)	205	191	57	29.84	20	10.47
5.	Safaiwala	28	28	28	100	--	--
		1123	960	177	18.43	58	6.04

During the year, the strength and composition of Orissa, Nagaland, Jammu & Kashmir, Karnataka, Punjab and Manipur and Tripura Cadres of the IFS have been reviewed and revised. Fifty probationers have been appointed to the IFS by direct recruitment and 25 State Forest Service Officers have been inducted into the IFS by promotion during the year. Forty-six IFS officers have been confirmed in the Services and 60 officers recruited on the results of IFS Examination, 1991 have been allocated to various cadres.

NGO Cell

The NGO Cell was constituted in the Ministry in May, 1992, with a view to strengthening the environmental movement in the country by promoting new NGOs and supporting the ones which are already operating, especially at the grassroot levels. The main functions of the NGO Cell are:

- To act as a single window reception counter at the Ministry of Environment and Forests for all NGO related activities being coordinated by different divisions of the Ministry.
- To coordinate various NGO oriented programmes under the auspices of Ministry of Environment and Forests.
- to collect information about NGOs working in various areas of the environment. Based on the information received, a directory of about 2,000 NGOs has been compiled by the NGO Cell.

A number of references have been received in the NGO Cell during the year and have been attended to. Most of these relate to queries about pending projects with the Ministry of Environment and Forests, request for various publications of the Ministry and information about grants-in-aid programmes wherein NGOs can play an active role. A NGO Cell has also been set up at the Central Pollution Control Board to involve them in pollution abatement programmes.

Grievance Cell

Grievance Cell was constituted in October, 1991, to attend to the complaints of public regarding environmental problems. The main function of the Cell is to ensure action for their redressal, which is being done by taking up the matter with concerned authorities such as District Magistrates, Municipal Corporations, Pollution Control Boards and State Governments. Most of the complaints relate to:

- unauthorised industries located in residential areas discharging harmful gases and hazardous effluents in the immediate neighbourhood;
- environmental degradation due to mismanagement of civic amenities like location of waste dump, water logging, etc;
- poor maintenance of open areas and parks and;
- commercial establishments operating illegally in the residential buildings causing nuisance to people living in the immediate vicinity.

During the year, 300 references have been received and attended to.

O&M Inspection

The O&M Inspection Section/Desks of the Ministry was carried out in accordance with the programme of Annual O&M Inspection drawn by the IWSU for the year 1994-95 as per the provisions contained in the Central Secretariat Manual of Office Procedure.

Record Management Activities

During the year special emphasis was laid on record management. Two special drives were launched to clear the backlog of recording and reviewing of files. On 22nd December, 1994, Joint Secretary incharge of Administration had a meeting of all Section Officers to review the functioning of various Sections. The meeting was followed by a talk on record management, explaining the importance of good record management and the need for timely recording, reviewing and weeding out of files. The Record Room of the Ministry has been shifted to a more spacious room to accomodate all the recorded files. The record retention schedule in respect of records connnected with the functions of various divisions was reviewed and revised in consultation with National Archives of India.

Review of Forms

The Committee set up to undertake periodical review of forms with a view to simplifying, eliminating unnecessary ones and amalgamating others, held a meeting on 23rd Novermber, 1994 and reviewed 41 forms. Two forms have been modified and four forms have been amalgamated into two.

Work Measurement Study

The committee set up in 1991 for undertaking work-measurement study in respect of Scientific and non-scientific posts in the Ministry has finalised its report on 6th January, 1995 in respect of the Ministry proper, Civil Construction Unit and the Ganga Project Directorate. A similar review of all the scientific and non-scientific posts of the NAEB and the six Regional Offices of the Ministry is proposed to be undertaken shortly.

Environment and Parliament

During the year, 881 Parliament Questions pertaining to various aspects of environment were dealt with by the Ministry and 448 questions in the Lok Sabha and 433 in the Rajya Sabha were answered. Industrial and vehicular pollution, deforestation, progress of afforestation, wildlife preservation, conservation and early clearance of developmental projects from environmental and forest angles were among the areas in which the Members of Parliament evinced keen interest.

Use of Hindi

As Official Language, Hindi is being progressively used in the Ministry and its Attached and Subordinate Offices.

The Hindi Salahakar Samiti has been reconstituted during the year and it held its first meeting under the Chairmanship of the Honourable Minister for Environment and Forests. The official Language Implementation Committee of the Ministry met regularly during the year.

Inspection of Offices

12 offices under the Ministry were inspected during the year to ensure effective implementation of the Official Language Policy.

Training in Hindi

During the year 10 employees were nominated for Hindi Typewriting, 6 for Hindi Stenography, 8 for Prabodh, 3 for Praveen and 3 for Pragya courses under the Hindi teaching Scheme.

Hindi Week

Hindi Week was organised from 1st-6th September, 1994 during which various competitions were held and prizes were distributed to the winners.

Incentives for Hindi Books on Environment

The scheme introduced to encourage creative and original writing in Hindi on topics relating to Environment etc. continued during the year. Out of 7 entries received under this scheme, the following books have been awarded prizes:

Vayumandaliya Pradushan Rs. 20,000 (First)
By Shri Hari Narain Srivastava

Paryavaran Shiksha Rs. 15,000 (Second)
By Shri A. N. Mathur & others

Paryavaran Vinash Ke Kagar Par Rs. 10,000 (Third)
By Shri Rajiv Gupta

Publication of Journal

The Quarterly Hindi Journal 'Paryavaran' continued to be published during the year with a view to encouraging creative writing in Hindi.

Translation

During the year, 8393 pages of important documents including answers to Parliament Questions, Cabinet Notes, Rules, Regulations, etc. were translated from English to Hindi and vetted.

Civil Construction Unit

Civil Construction Unit (CCU) was set up in the Ministry in August, 1987 for taking up important works for the Ministry on priority basis, in pursuance of the government's decision that major scientific departments with substantial annual civil works budget should have a Civil Engineering Unit. The technical posts are manned by officers drawn from the C.P.W.D. These works relate to various units of the Ministry, viz., Botanical Survey of India, Zoological Survey of India, National Museum of Natural History, Indian Council of Forestry Research and Education (ICFRE), G.B. Pant Institute of Himalayan Environment and Development, Indira Gandhi National Forest Academy, Forest Survey of India and National Zoological Park.

The Civil Construction Unit has taken up 75 major schemes fo far with a total estimated cost of Rs. 88 crores. The works mostly consist of construction of office-cum-laboratory buildings, Herbariums, Museums of Natural History, Forest Research Institutes, National Forest Academy, National Zoological Parks and Residental Quarters for staff located all over India. Out of these 38 works, costing Rs. 58.10 crores are being directly executed by CCU, which has 3 field divisions with sub-divisions at Delhi, Dehradun, Almora, Bangalore, Mysore, Coimbatore, Jodhpur and Jabalpur. Works in Eastern, North Eastern and Western Zones have been entrusted to CPWD or to the State PWDs and their progress is monitored by the CCU. However, planing of all the works including those executed by CPWD/State PWDs is undertaken by CCU. The ICFRE has desired that works relating to the setting up of new institutes of the Council at Hyderabad and Allahabad may also be taken up by the CCU.

In tune with the Ministry's policy of substituting wood, wherever possible, CCU has adopted the use of a number of alternatives for timber in the buildings being constructed by them. Use of wood in doors, windows and cupboard has been dispensed with completely and steel sections/ pressed steel frames/aluminium sections are being used for doors and windows frames, depending upon the importance of buildings, conventional wooden panels/flush door shutters have been replaced with agro-based MDG Boards/PVC panel shutters. Of late, use of Eucalyptus timber, which is a plantation timber, is being adopted for doors and shutters, after treating the same as per F.R.I. technology. Such shutters are being fixed at the Scientist Hostel at F.R.I. Dehradun, on an experimental basis. Use of photo voltaic cells is being introduced at selected areas to popularise the use of alternative source of energy. Compact Fluorescent Lamps (CFL) are being used for corridor lights in Guest Houses and Hostels, office building etc., for conserving energy. Solar water heating system has been introduced for heating of water in hostel buildings.

At present there are 20 major works amounting to Rs. 26.03 crores which have been awarded and are under execution by CCU.

Details regarding works completed during 1994-95, works in progress, works for which sanctions have been received recently and are likely to be started, new works for which sanctions are waited and works in planning stage are as follows:

A. Works completed/likely to be completed during 1994-95

	Name of work	Cost (Rs. in lakhs)
1.	Herbarium cum office building for BSI, Shillong.	55.47
2.	Construction of 65 Nos. staff quarters for BSI, Shillong.	199.93
3.	Construction of staff quarters for BSI, Pune.	35.81
4.	Construcion of 12 Nos. staff quarters for ZSI, Itanagar,	37.55
5.	Office building for ZSI, Port Blair.	59.83
6.	Construction of 41 Nos. quarters (Ph. II) for IFGTB, Coimbatore.	72.00
7.	Extension of guest house and provision of dormitory accommodation for drivers and garage.	15.00

8. Arid Forestry Research Institute, Jodhpur

a) Office cum laboratory building	277.00
b) Construction of residential quarters 40 Nos. (Ph. I)	154.00
c) Construction of residential quarters 32 Nos. (Ph. II)	75.00

9. G.B. Pant Institute of Himalayan Environment and Development

a) Construction of 46 Nos. residential quarters.	150.00

B. Works in progress

Name of work	Sanctioned cost (Rs. in lakhs)
1. Botanical Survey of India	
a) * Construction of staff quarters (23 Nos.) at Gangtok.	65.26
b) * Herbarium cum office building, Gangtok.	38.80
c) * Harbarium cum, office building, Pune	118.98
d) * Residential quarters 20 Nos., Port Blair.	49.67
2. Zoological Survey of India	
a) * Annexe Building for ZSI, Calcutta.	210.47
b) * Office cum lab building for APFS, Itanagar	20.67
c) * Office cum lab building , Pune.	137.49
3. National Museum of Natural History	
a) * RMNH building at Bhopal	183.00
4. Arid Forest Research Institute, Jodhpur	
a) Residential quarters 27 Nos. (Ph. III)	115.00
b) Construction of Scientist Hostel.	89.60
5. IFGTB, Coimbatore	
a) Construction of 72 Nos. quarters (Phase III)	195.00
6. Institute of Wood Science & Technology, Bangalore	
a) Construction of laboratories and workshop.	425.00
b) Construction of 8 Nos. Type IV quarters.	29.59
c) Construction of 2 Nos. Type I & 4 Nos. Type II quarters.	9.82
7. FRI, Dehradun	
a) Construction of Scientist Hostel	159.00
b) Residential quarters 16 Nos. Type V for ICFRE Dehradun	106.00
8. Tropical Forest Research Institute, Jabalpur	
a) Construction of 78 Nos. staff quarters (Phase II)	214.00
b) Construction of Guest House	80.10
c) Construction of 40 Nos. staff quarters (Phase III)	157.31
d) Construction of library cum information centre.	89.69
9. Construction of G. B. Pant Institute of Himalayan Environment & Development, Almora	
a) Construction of faculty building and guest house.	116.00
b) Library building and hostel.	74.00

* Planning done by CCU and works executed by CPWD

C. Works which are likely to be started during 1994-95 for which sanctions have been accorded recently.

Name of Work	Cost (Rs. in lakhs)
A. ICFRE Headquarters, Dehradun	
1. Construction of National Library & Information Centre (World Bank Aided).	354.00
2. Office building for ICFRE Headquarters (World Bank Aided).	443.00
B. Arid Forestry Research Institute, Jodhpur	
1. Construction of 40 Nos. residential querters in plot 729 (Phase IV)	177.00
C. Tropical Forst Research Institute, Jabalpur	
1. Transit Scholars Hostel	96.93
2. Scientists Hostel	106.78
3. Instrumentation Centre	19.53
4. Auditorium-cum-Community Centre	102.31
D. IFGTB, Coimbatore	
1. Scientists/Scholars' Hostel	170.68

E. IWST, Bangalore

1. Construction of Guest House 63.06

F. Regional Museum of Natural History at Bhubaneswar 100.00

G. Z.S.I.

1. Construction of Office and lab. building at Pune for ZSI 137.49

D. New Works for which sanctions are awaited

1. Construction of 69 Nos. residential quarters for FSI Dehradun 136.59
2. Extension Institute, TFRI, Jabalpur 111.53
3. Scientists Hostel, TFRI, Jabalpur (World Bank Aided) 45.00
4. Development estimate for Plot No. 729 for AFRI, Jodhpur 131.02
5. Scientists Hostel for MARC, Digha 15.00
6. Construction of G.B. Pant Institute of Himalayan Environment and Development at Gangtok. 300.00

E. Works at planning stage

1. Construction of Library-cum-Information Centre, IWST, Bangalore.
2. Construction of Library cum Information Centre for IGFTB, Coimbatore
3. Extension Institute for AFRI, Jodhpur
4. Construction of Eastern Regional Office and staff quarters for Ministry of Environment and Forests at Bhubaneswar.
5. Construction of office building for Animal Social Welfare Board, Madras.
6. Construction of office building, laboratories, residential quarters for Centre for Social Forestry and Eco-rehabilitation at Allahabad.
7. Construction of laboratories, office accommodation and residential quarters for Centre for Social Forestry and Eco-rehabilitation at Hyderabad.
8. Construction of Guest House for IIFM, Bhopal.

Plan Co-ordination and Budget

The Plan Co-ordination Division in responsible for the co-ordination of all plan schemes and programmes of the Ministry with the Planning Commission. The Division also looks after the monitoring of progress reports and reports under the 20-Point Programme (Points 16 and 17).

An amount of Rs. 1200.00 crores has been allocated to the Ministry for the Eighth Five Year Plan (1992-97). This outlay constitutes about 0.5 per cent of the total Central Sector Plan Outlay of Rs. 247,865 crores. The current year 1994-95, has been allocated an outlay of Rs. 360 crores as against Rs. 318 crores for 1993-94. The sector-wise break-up is given in Table 11.

Table-11

Eighth Plan and Annual Plan Outlays-
Ministry of Environment and Forests

(Rs. in crores)

Sl. No.	Sector Outlay	VII Plan Outlay	VIII Plan Outlay	Annual Plan 1992-93	1993-94	1994-95
1.	Environment	110	325	48	70	79
2.	Ganga Action Plan	240	350	55	65	78
3.	Forest & Wildlife	155	250	62	85	100
4.	National Waste-land Development Board/National Afforestation and Eco-Development Board	292	275	155*	98	103
	Total	797	1200	280	318	360

* Rs. 26.19 crores transferred to NWDB

The total Public Sector Plan outlay for the year 1993-94 and 1994-95 is given in Table 12.

Table-12

(Rs. in crores)

	Annual Plan 1993-94		Annual Plan 1994-95
	BE	RE	BE
Central Plan	63936	61454	70141
State & UT's Plan	36184	31175	42056
Total :	100120	92629	112197

The corresponding allocation in the Environment and Forestry sectors, alongwith this sector's share in total plan outlays, are given in Table 13.

Table-13

Outlays in Environment and Forestry Sector

(Rs. in crores)

	Annual Plan 1993-94		Annual Plan 1994-95
	BE	RE	BE
1. Central Sector Plan (Ministry of Environment and Forests)	318	304	360
2. States & UTs Plan	706	621	797
3. Total Outlay in Central and State Plans	1024	925	1157
4. Total outlay in Environment and Forestry sector as % of total Public Sector outlay	1.02	1.00	1.03
5. Plan outlay of Ministry of Environment and Forests as % of total Central Plan Outlay	0.5	0.5	0.5
6. States Plan Outlays under Environment & Forestry as a % of total States Plan	2.0	2.0	1.9

The actual expenditure in 1992-93 was Rs. 275 crores and is provisionally placed at Rs. 303.5 crores in 1993-94. The Budget and Revised Estimates for 1994-95 were placed at Rs. 360 crores. The progress of plan schemes of the Ministry was reviewed regularly and necessary corrective actions taken to ensure proper implementation of these schemes.

For the Annual Plan 1995-96 the Ministry has been allocated on outlay of Rs. 370.50 crores as per the following sectoral break-up:

	(Rs. in crores)
1. Environment	80.00
2. Ganga Action Plan	79.00
3. Forests and Wildlife	107.50
4. National Afforestation and Eco-Development Board	104.00
Total :	370.50

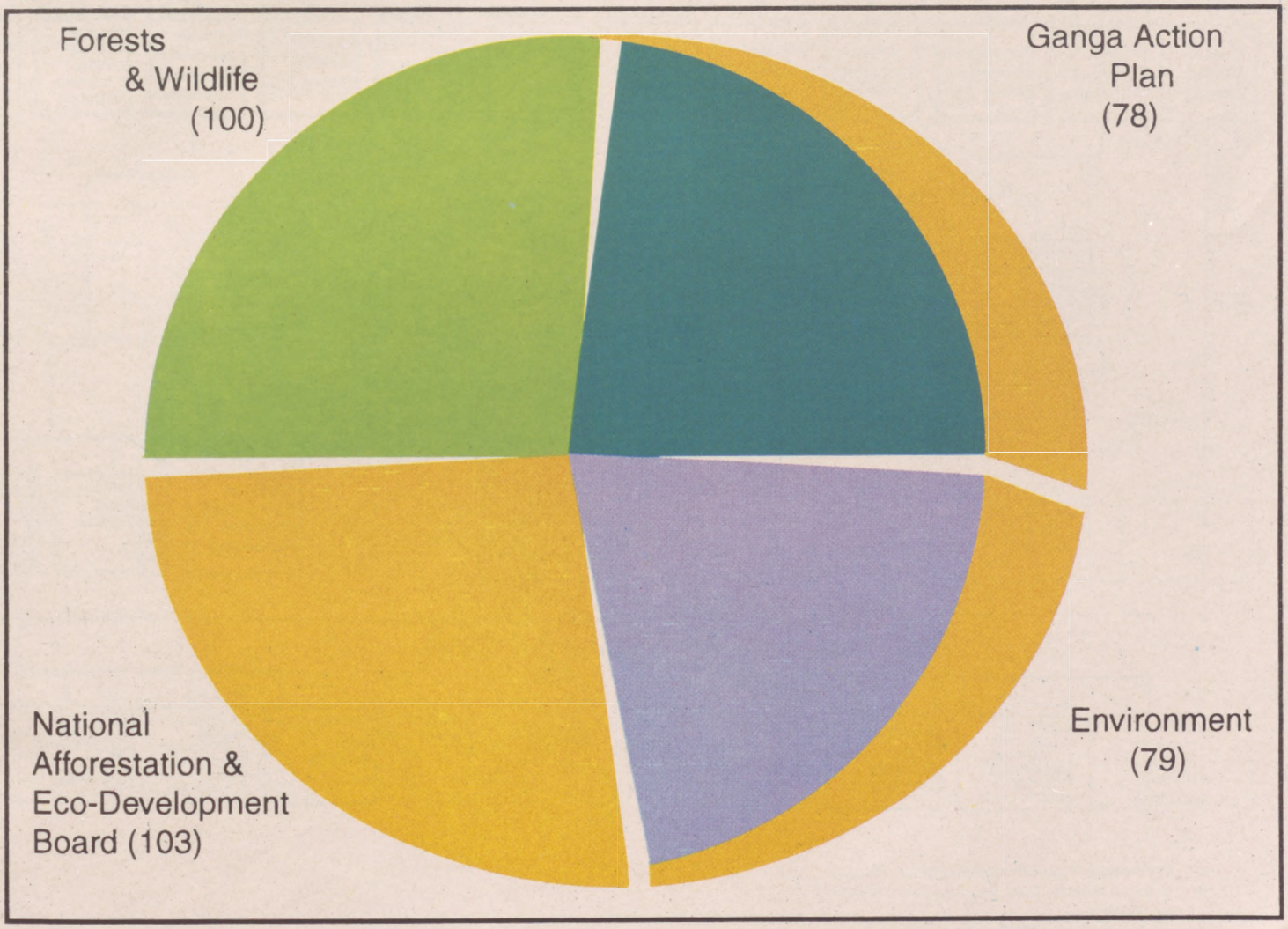
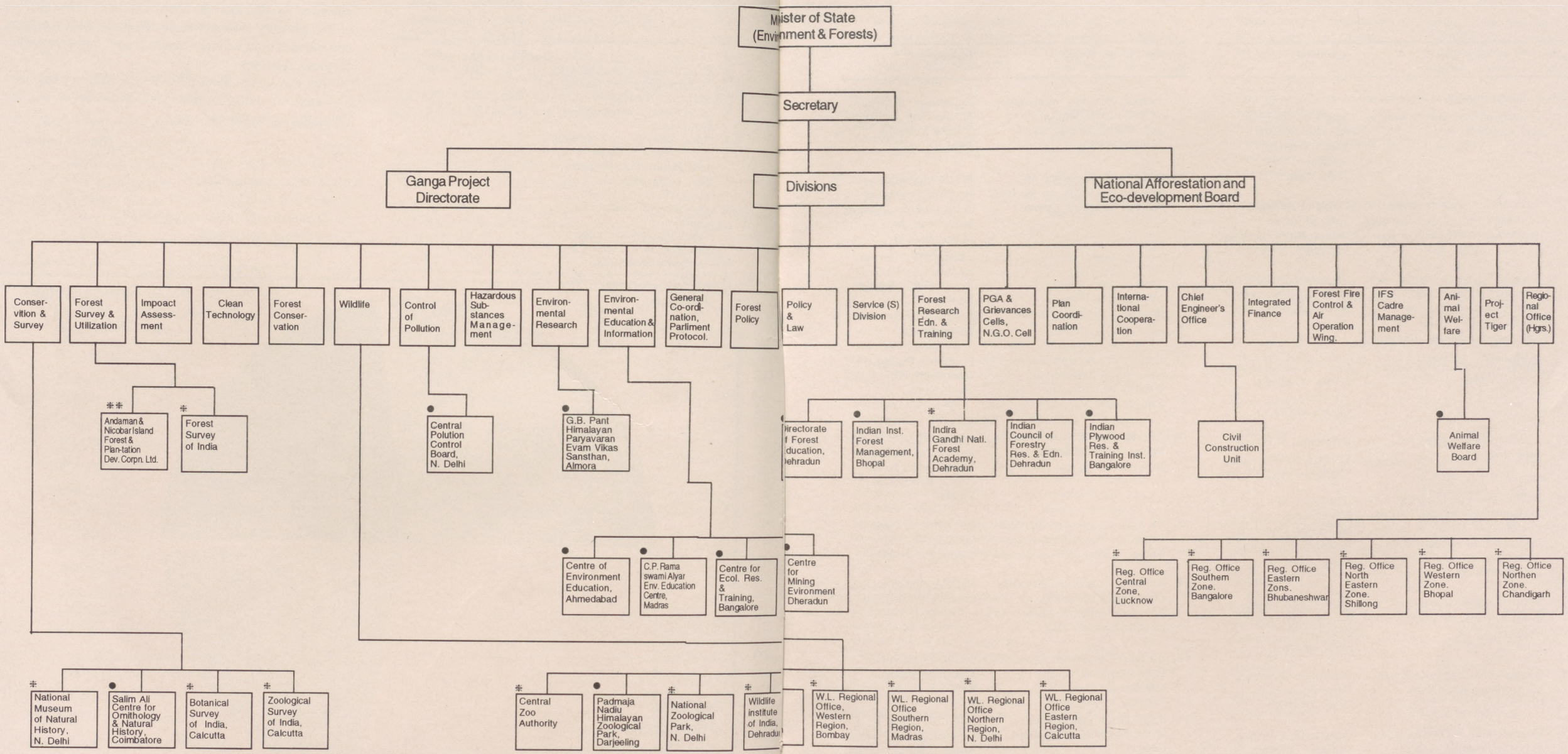


Fig. 75 Areawise Distribution of Funds for the Year 1994-95 (In Rs. Crores)

ORGANISATION CHART OF THE MINISTRY OF ENVIRONMENT & FORESTS

Annexure-I



● Autonomous Agencies assisted by the Ministry
⁜ Associated Units under the administrative control of the Ministry
⁜⁜ Public Sector Undertaking

LIST OF PROJECTS SANCTIONED DURING 1994-95

Sl. No.	Title of the Project	Institution
	Man and the Biosphere Programme	
1.	A study on cave environment and cavefauna.	School of Biological Sciences, Madurai Kamraj University, Madurai-625021. Tamil Nadu.
2.	Isolation and characterization of tropical soil micro-oroganisms in relation to CH_4 & N_2O flux.	Centre of Advanced Study in Botany, Banaras Hindu University Varanasi-221005, U.P.
3.	Revegetation in the coastal ecosystem. Nursery stock improvement of *Casurina equisetiolia* by suitable ectomycorrhizal fungal inoculation.	Centre of Advanced Study in Botany, University of Madras, Madras-600 025.
4.	Survey of lesser known legumes of South India.	Centre of Advanced Study in Botany, Madras University, Madras-600025.
5.	Ageratum caused threat to plant diversity.	Department of Botany, Punjab University, Chandigarh-160 014.
6.	Establishment of Vesicular Arbuscular Mycorrhizal (VAM) in root organ culture in forest tress and their application for reclamation of mine spoils in Madhya Pradesh.	Department of Microbiology, Barkatullah University, Bhopal-462026 (M.P.)
7.	Butterfly ranching/farming in South Andaman--A feasibility study.	Central Agricultural Institute, Port Blair-744101 A&N Islands.
8.	Biology of some gum and gum resin yielding forest trees.	Department of Botany, University of Delhi, Delhi-110 007.
9.	Ethnobotanical studies on wild plants for food/fodder from Aravalli hills of Rajasthan.	Department of Botany, Sukhadia University, Udaipur-313001. Rajasthan.
10.	Aspects of human infringement in and around National Parks and Wildlife Sanctuaries of Madhya Pradesh.	Department of Tribal Studies Rani Durgavati Vishwa Vidyalaya, Jabalpur, M.P.
11.	Patterns of distribution of Vertebrate diversity on the Great Nicobar Biosphere Reserve.	MS Swaminathan Research Foundation, 3rd Cross Strees, Taramani Institutional Area Madras-600113, Tamil Nadu
12.	Study on man-wildlife interaction in Wyanad Wildlife Sanctuary of Kerala	Kerala Forest Research Institute, Peechi, Trichur, Kerala-600 005
13.	Ecology of Insect pollination with special reference to butterfly pollination in Shevroy hills.	Presidency College Madras-680 005 Tamil Nadu.
14.	All India Coordinated Research Project on Ethnobiology-Rajasthan & Gujarat.	Tropical Botanic Garden & Research Institute, Karimancode, Pacha Palode, Trivandrum, Kerala.
15.	All India Coordinated Research Project on Ethnobiology-Assam Tripura, Sikkim & West Bengal.	BSI, Eastern, Circle Shillong Unit, Meghalaya.
16.	All India Coordinated Research Project on Ethnobiology-Karnataka, Dadra & Nagar Haveli, Daman & Diu.	BSI, P-8, Brabourne, Road Calcutta, West Bengal.
17.	All India Coordinated Research Project on Ethnobiology-Coordination Unit.	IBGRI, Pacha Palode, Thiruvananthapuram, Kerala.
18.	Status of sea grass habitats of the Andaman & Nicobar Coast	Salim Ali Centre for Ornithology and Natural History, Kalayampalayam, Coimbatore-641 010, Tamil Nadu.

Sl. No.	Title of the Project	Institution
19.	A study on the ecology, status and conservation perspectives of Certain rare endemic avifauna of the Andaman & Nicobar Islands.	Salim Ali Centre for Ornithology and Natural History Kalayampalayam, Coimbatore-641010. Tamil Nadu
20.	Studies on the ecology, adaptations and evolution of sociality in Non-human primates of South India.	Unviersity of Mysore Manasagangotri Mysore-570 006. Karnataka.
21.	Ecological analysis of different occupational practics in Mizoram.	Pachhunga University College Aizawal-796001 Mizoram.
22.	Status and distribution of rare and endangered animals of Kerala and publication of a booklet.	Kerala Forest Research Instt., Trissur District, Peechi-53 Kerala.
23.	Bio-resource and systematic study of the geocorime predators (Lygaeidae, Hemiptera : Insecta) from Indian Sub-continent.	Centre of Life Sciences North Bengal University, Darjeeling-734 430.
24.	Sublethal effects of pollutants on fish eggs and larvae.	Department of Zoology, Gulbarga University, Gulbarga-585 105. Karnataka.
25.	Status and survey for accurence and range of a torrential waterfish Glyptothorase, threatened due to human engineering activity at Sunkesula in Thungabhadra river.	Osmania Unviersity Hyderabad-500 001., Andhra Pradesh.
26.	Studies on the histochemistry of gonads in relation to the ecology and migratory phenomenon of the endangered Golden Mahseer (Torputitora).	H.N.B. Garhwal University Srinagar, Uttar Pradesh.
27.	Biosystematic studies on the insect predator resources in natural and integrated forests of the cardamom and pulney ranges of Southern India.	Entomology Research Instt., Loyala College, Madras-600 034. Tamil Nadu.
28.	Ecology of 'Chars' on river islands of Brahmaputra with special reference to fisheries.	Dibrugarh University, Dibrugarh, Assam.
29.	Genetic studies in populations of frogs inhabiting different ecological regions.	Society of Bionaturalists F-120/15, Shivaji Nagar Bhopal-462 016. Madhya Pradesh.
30.	Propagation of endemic tree species in relation to hydro-biological and soil conditions for polyculture afforestation on grassland and wasteland in Chikmagalur district.	Sri JCBM College Sringeri, Dist, Chikmagalur Karnataka-577 139.

Environmental Research Programme

1.	On optimization of air quality monitoring network.	Jawaharlal Nehru Univ., New Delhi.
2.	Development of nitrate selective resins for removing nitrate in potable water.	Central Salt and Marine Chemical Research Instt., Bhavnagar.
3.	A study of pollution abatement costs in Dindigul Leather Tanneries.	Madurai Kamraj University Madurai (T.N.)
4.	Biodegradation of oil in terrestrial and aqueous environment.	School of Life Sciences, Bhartidasan University, Tiruchirapalli.
5.	Microbial reduction of sulphate to hydrogen sulphide.	Centre for Environmental Science and Engineering, I.I.T. Powai, Bombay.
6.	Environmental impact of selenium released into atmosphere by thermal power plants in Mahanandi Coal belt of Orissa.	Regional Research Lab., Bhubaneshwar.
7.	Genetic toxicity studies in the slum dwellers living/ working on the banks of Musi river and Kakatpally Nalla in Hyderabad.	NEERI Zonal Laboratory I.I.C.T. Campus, Hyderabad-500 007.
8.	Aflatoxin in rice bran: control measures.	CAS in Botany, Madras University, Guindy Campus, Madras.
9.	Rural sanitation and environment: A study in Uttar Pradesh.	B.L. Centre for Development Research and Action, 196, Shivani Vihar, Kalyanpur, Lucknow.

Sl. No.	Title of the Project	Institution
10.	Water quality of Dand Karanya.	Deptt. of Chemistry, Ravishankar University, Raipur.
11.	Preparation of chemicals like ammonium sulphate, magnesium sulphate and calcium carbonate foam phospogypsum for preparation of Ammonium sulphate, Calcium carbonate and Magnesium sulfate.	Regional Research Lab., Bhubaneshwar.
12.	Recylcing of the photographic chemicals.	Central Electro-Chemicals Research Instt., Karaikudi-623006. (T.N.)
13.	Standardization of reference seed culture for Biochemical Oxygen Demand (BOD) estimations	Centre for Biochemical Technology, Mall Road, New Delhi
14.	Detoxification of toxic organic pollutants using modified clays,	Bhartidasan University, Tiruchirapalli.
15.	Biodegradation of lignin derivatives and compounds from pulp and paper mill effluents.	Regional Research Laboratory, Bhubaneshwar.
16.	Studies on pollution due to slum sludge and development of methods for its utilisation.	Regional Research Laboratory Bhubaneshwar.
17.	Mining development and its impact on the environment role and perception of women in the Raniganj coal belt of Burdwan Distt., West Bengal.	Department of Geography, University of Burdwan, Burdwan.
18.	Assessment of impact of hot hazardous working environments on Indian Industrial and Agricultural workers and development of ergonomically designed personal protective devices.	H.B.-260, Sector-3, Salt Lake City, Calcutta-7.
19.	Development of a suitable plastics recycling process with a view to reduce environmental pollution and converting plastics waste into valuable products.	Shriram Instt. for Industrial Research, 19, University Road, Delhi-110 007.
20.	Strategy of environmental management for weathering of rocks due to micro-organism on the temples of Puri, Konark and Bhubaneshwar.	Utkal University, Bhubaneshwar.

Sl. No.	Title of the Project	Institution
21.	Restoration strategy in polluted wetlands: effectiveness of some biological agents.	Department of Zoology, University of Kalyani, Kalyani, W.B.
22.	In-vitro effect of environmental carcinogen Benopyrene on the human breast tissue.	Department of Pathology, Maulana Azad Medical College, New Delhi.
23.	Ethno-ecological analysis of the highlands of Chotanagpur District.	Department of Geography, Post Graduate A.N. College Patna.
24.	Reclamation of polluted soils of Tami Nadu using mycorrhizeri fungi and their application in afforestation.	CAS in Botany, Madras University, Madras.
25.	Physiochemical and genetic study on cynobacterial response to the combined effect of salinity and temperature stress: construction of stress tolerant mutants.	Department of Microbiology Avadh University, Faizabad-224 001.
26.	Studies on toxic metals in the soil water system in and around Lakewa oil fields with special reference to the tea gardens.	Regional Research Laboratory, Jorhat.
27.	Biochemical effects of cadmium toxicity during germination and early seedling growth of rice.	Department of Biochemistry, Hindu University, Varanasi.
28.	Environmental impact of mining activity on land use: A case study of Udaipur minerals basin.	Sukhadia Unviersity, Udaipur.
29.	Ground water quality status in relation to landuse pattern and geohydrological condition in Madhya Pradesh.	Department of Limnology, Barkatullah University, Bhopal-462 026.
30.	Development of indigeneous technology for the removal of sulphur compounds and colour from distillary effluents.	Industrial Toxicology Research Centre, Lucknow.
31.	IInd phase of the project microbial treatment of waste water from the nitrogen fertilizer industry: Nitrification studies.	I.I.T., Bombay.

Sl. No.	Title of the Project	Institution
32.	Coordinated Project on Aerobio-Pollution and Human Health.	21 Universities, R&D Laboratories, etc., are participating in this project.

Eastern and Western Ghats

1.	Socio-economic analysis of ecosystem in Kodayar forests in the Western Ghats-strategy for ecological management.	Madurai Kamaraj University, Madurai.
2.	Conservation of biological studies on endemic rare and endangered species of Arisaema (Araceae) in the Southern Western Ghats.	Tropical Botanic Garden Research institute, Thiruvananthapuram.
3.	Aspects of reproductive biology of some endangered endemic palms in India	Bombay University, Vidyanagar, Bombay-98.
4.	Studies for augmenting natural and artificial regeneration of Sandal in South Kannada.	Tamil Nadu Agricultural University, Coimbatore.
5.	Study of population, habitat and survival of black buck *(Antilope carcicopra)* in Balipodar Bhetnoi game reserve of Ganjam District.	Chief Wildlife Warden, Govt. of Orissa, Bhubaneswar
6.	Bauxite mining environmental impact assessment in Yercaud hills of Eastern Ghats.	School of Energy Sciences, Madurai Kamaraj University, Madurai.
7.	Studies for developing integrated resource management plan for Gudur Division in Andhra Pradesh.	Osmania University, Hyderabad, Andhra Pradesh.
8.	Impact of effluent discharge from aquaculture ponds on environment.	AVVM Sri Pushpam College, Thanjavur District, Poondi, Tamil Nadu.
9.	Impact of mining on environment in Goa-present status.	University of Goa, Goa.

Wetlands

1.	Salinity dependent setabolic alterations in macrophytes of Chilka Lake.	Dr. B.P. Shaw Instt. of Life Sciences Bhubaneshwar.
2.	Status, survey, distribution, population, dynamics, breeding ecology, conservation and management of fresh water of J&K State.	Prof. M.K. Jyoti PGD of Biosciences, University of Jammu Jammu.
3.	Impact of anthropogenic activities on Bhoj Wetland with Particular emphasis on nutrient dynamics.	Dr. Ashwani Wanganco Deptt. of Limnology Barkathullah, Vishwavidyalaya Bhopal
4.	Impact of anthropogenic influences on Siwalik lakes (Mansar & Surinsar) and Gharana Wetlands of Jammu Division of J&K State with development methods for conservation of these rare water bodies.	Dr. Y.P. Malhotra Deptt. of Biosciences University of Jammu Jammu

Mangroves

1.	Distribution of Mangroves Forests in time and space in the eastern Indian Sub-continent with particular reference to palaeoenvironment and palaeoshordine.	Dr. Manju Banerjee University of Calcutta Calcutta

Biopshere Reserves

1.	Studies on the Biodiversity of Invertebrates (Annelids, Tureela-rains, Bivalves, Gastropodes & Crustaceans) and Vertebrates (Fishes) in the GOM.	CAS in Marine Biology, Annamalai University, Parangipetti 608 502.
2.	Biodiversity of Microbial Flora, Bacteria & phytoplankton of the Coral Reefs of GOM.	CAS in Marine Biology, Annamalai University, Parangipettai-608 502.
3.	Organic matter, nutrients, trace metal cycling and regeneration in the GOM.	CAS in Marine Biology, Annamalai University Parangipettai-608 502.

Sl. No.	Title of the Project	Institution
4.	Studies on Mangrove Ecosystem of Gulf of Manner Islands and their impact on Larval recruitment of economically useful fishes and prawns.	CMFRI, 68/1, Greams Road, Madras 600 006.
5.	Studies on the status and conservation perspectives of rare and endemic fishes on the Nilgiri Biosphere Reserve.	Salim Ali Centre for Ornithology and Natural History, Coimbatore-641 010.
6.	A study on the distribution, ecology and conservation of the small carnivores in the Nilgiri Biosphere Reserve.	Salim Ali Centre for Ornithology and Natural History, Coimbatore 610 010.
7.	Status of the Wildlife Corridors and their use by selected endangered mammals in the Nilgiri Biosphere Reserve.	Salim Ali Centre for Ornithology and Natural History, Coimbatore 641 010.
8.	A survey of the reptiles and amphibians in the Kerala part of Nilgiri Biosphere Reserve.	Kerala Forestry Research Institute, Peechi, Kerala.
9.	A study on socio-economic aspects for sustainable development of dependent population.	Wildlife Insitutte of India, Dehradun
10.	Studies on the role of micro-organism in relation to entero-pathogenic diseases and also geomicrobial cycling in the coastal water of deltaic Sunderbans.	Department of Marine Sciences, Calcutta University, Calcutta
11.	Investigations on the Probable Microbial Pathogens posing a threat to brackishwater aqua-farming in Sunderbans and occurence in the farm released untreated waste-water.	Wastewater Aquaculture Division, Central Institute of Freshwater Aquaculture, Rahara Fish Farm, West Bengal.
12.	Ethno ecology and phyto-chemistry of Medicinal Plants in the Nilgiri Biosphere Reserve.	Salim Ali Centre for Ornithology and Natural History, Kalampalayan P.O., Coimbatore-641 010.
13.	Habitat Monitoring of Bandipur National Park.	Salim Ali Centre for Ornithology and Natural History, Coimbatore-641 010.

NNRMS

Sl. No.	Title of the Project	Institution
1.	Application of Remote Sensing Techniques to Coastal Wetland Ecology of Tami Nadu with special reference to Mangroves.	Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai (T.N.) and Institute of Ocean Management, Anna University, Madras.
2.	Monitoring or Godavari Estaurine and Mangroves Environment off Kakinada Bay using Remote Sensing and In-situ measurement methods.	Centre for Environment and Centre for Remote Sensing, JNT University, Hyderabad.
3.	Environmental Impact Assessment of Dhanbad Distt. with particular reference to soil and forest cover through remote sensing images.	Department of Applied Geophysics, Indian School of Mines, Dhanbad.
4.	Monitoring and identification of shifting cultivation areas of East Khasi Hills District of Meghalaya by using Remotely Sensed Data.	North Eastern Hill University, Shillong.

LIST OF PROJECTS COMPLETED DURING 1994-95

Sl. No.	Title of the Project	Institution
	Man and the Biosphere Programme	
1.	Behavioural ecology and measures for conservation of bats.	School of Biological Sciences, Madurai Kamaraj University, Madurai-625001, Tamil Nadu.
2.	Integrated pest management in fresh water ecosystems using the fish and aquatic insect communities.	Department of Zoology, Loyola College, Madras, Tamil Nadu.
3.	Studies into ecological and socio-economic impacts of open cast coal mining and evaluation of technology for restoration of the site productivity of colliery over-burden work.	State Forest Research Instt., Polipathar, Jabalpur-482 008, Madhya Pradesh.
4.	Analysis of the ecosystems of the command and uncommand areas of Indira Gandhi Canal with particular reference to moisture regime and inter cropping behaviour of *Lasirus sindicus.*	Dungar College, Bikaner, Rajasthan 334 001.
5.	Effect of water pollution and dams on fish and fisheries of Punjab.	Department of Zoology, Punjab Agricl. University, Ludhiana, Punjab.
6.	Development and use of Myco-insecticide from indigenous fungal pathogen against Brown Plant Hopper problem in rice.	Department of Entomology, Annamalai University, Annamalai Nagar, Tami Nadu-641 002.
7.	Side effects of pestcidies on Vesicular Arbuscular Mycorrhizal model system.	Department of Plant Pathology, Haryana Agricl. University, Hissar-125 004, Haryana.
	Environmental Research Programme	
1.	Use of cytoplasmic streaming in characean algae for monitoring aquatic pollution.	Jamia Millia University, New Delhi.
2.	Development and standardization of preconcentration methods for monitoring pesticide residues in environmental samples.	Department of Applied Sciences, Aligarh Muslim, University, Aligarh (UP).
3.	Studies on chemistry of dry, wet and bulk deposition at Agra	Department of Chemistry, Agra Unviersity, Agra.
4.	A study of the impact of oil exploration on the micro-flora in the rice fields of Upper Assam.	Institute of Advanced Studies in Science and Technology, Khanapara, (Guwahati)
5.	Assessment and evaluation of impact of environmental pollution on tribal population in the mineral activity of tribal sub-plan region of Rajasthan.	Sarita, 12, Rajendra Nagar, Gariavas Road, Udaipur-313007. (Rajasthan).
6.	Environment impact assessment of transport projects methodology development for Indian condition.	Applied System Research Programme, Electric Engg., I.I.T. Hauz Khas, New Delhi.
	Eastern and Western Ghats Programme	
1.	Impact of new settlers in the Western Ghats Region on the socio-economic conditions of the tribal population of Wynad District in Kerala.	Kerala Agricultural University, Trichur.
2.	Biology and control of the weed, *Eupatorium odoratum* in Western Ghat area.	University of Agiruclltural Sciences, Dharwad.
3.	Experiments on eco-restoration at the abandoned iron ore mine sites and reject dumps at Goa.	Dhempe College of Arts and Science, Miramar, Panaji, Goa.
4.	Study on growth and nitrogen fixation ability of some leguminous plant species for reclamation of Eastern Ghats of Orissa.	Utkal University, Vani Vihar, Bhubaneshwar.
5.	Impact of mining on Environment in Goa.	Goa University. Goa.

LIST OF FILMS SPONSORED BY THE MINISTRY DURING 1994-95

Sl. No.	Title	Format and Duration	Subject
1.	Plastic truth	U matic 21.5 min.	The film is based on Utilisation of Plastic.
2.	Kalrav	U matic 30 min.	This is a documentary film on birds in cages. This documentary goes into details of how many people house birds insmall enclosures without knowing the adverse effects to the birds,.
3.	Jagriti	U matic 29.4 min.	Sustainable use of natural resources.
4.	Elephants-the last giant on the Earth	Betacam 45 min.	Elephant Conservation.
5.	Tears for the Crocodile	Betacam 25 min.	Salt Water Crocodile and its Conservation.
6.	Papeeha	U matic 120 min.	Conservation of Forests.
7.	Seunta	Betacam 23 min.	The film is based on tribe of M.P. which has forced to transform its mode of life because of certain environmental pollution.
8.	Vanishing Paradise	Betacam 30 min.	Conservation and management of natural resources in relation to protection of environment with particular reference to Andaman & Nicobar Islands.
9.	Islands of Individuality	Betacam 30 min.	Conservation and management of natural resources in relation to protection of environment with particular reference to Andaman & Nicobar Islands.
10.	Wild elephant capture at Sarguja	U matic 12 min.	Capturing of wild elephant.
11.	The Bounties of Nature	Betacam 38 min.	Biodiversity in Himalaya.
12.	News clip for World Environment Day	Betacam 12 min.	News clippings on celebration of World Environment Day from different papers/magazines.
13.	Benefit for whom at whose cost	U matic 30 min.	Rehabilitation of oustees of power projects.
14.	Hazardous Chemicals & Pesticides	Umatic 21 min.	Pesticide pollution.
15.	Pollution Prevention (Most Polluting Industries)	U matic 21 min.	Measures to prevent pollution
16.	Animals Trade & Wildlife Poaching	U matic 21 min.	Animal Welfare.
17.	Mitra Pakheru	U matic 10 min.	Wildlife Conservation
18.	Julaha Prakriti Key	U matic 10 min.	Animal Welfare

Annexure-V

LIST OF REGIONAL OFFICE/ASSOCIATED/ AUTONOMOUS AGENCIES/ENVIS CENTRES/ CENTRES OF EXCELLENCE ETC. OF THE MINISTRY OF ENVIRONMENT AND FORESTS

Regional Offices :

1. Regional Office
North East Zone
Ministry of Environment and Forests
Upland Road, Leitumkhra
Shillong-793 003.

2. Regional Office
Central Region
Ministry of Environment and Forests
B-1/72, Sector Aliganj
Lucknow-226 020.

3. Regional Office
Northern Region
Ministry of Environment and Forests
1812, Sector 33-D
Chandigarh.

4. Regional Office
Western Region
Ministry of Environment and Forests
E-3/24, Arera Colony
Bhopal-664 016.

5. Regional Office
Southern Region
Ministry of Environment and Forests
493, 1st Main
III Block, III Stage
Basaveswar Nagar
Bangalore-560 079.

6. Eastern Region
Ministry of Environment and Forests
194, Kharavel Nagar
Bhubaneshwar 751 001.

Centres of Excellence

1. Centre for Environment Education
Nehru Foundation for Development
Thaltej Tekra
Ahmedabad 380 054.

2. C.P.R. Environmental Education Centre
1A, Eldams Road
Madras 600 018.

3. Ecological Research & Training Centre
Indian Institute of Science
Bangalore 560 012.

4. Centre for Mining Environment
Indian School of Mines
Dhanbad 826 004.

5. Salim Ali Centre for Ornithology and Natural History (SACON), Kalayampalayam,
Coimbatore-641 010.

Regional Offices of NAEB

1.	Coordinator (SFSO: Regional Unit) University of Agircultural Sciences, Department of Economics, GKVK Campus (P.B. No. 2477) Bangalore 560 065 (Karnataka).	Andhra Pradesh. Tamil Nadu, Kerala and Karnataka.
2.	Coordinator (SFSO; Regional Unit) Dr. Y.S. Parmar University of Horticulture and Forestry, College of Forestry Nauni, Solan 173 230 (Himachal Pradesh)	Jammu & Kashmir, Himachal Pradesh, Punjab.
3.	Coordinator (SFSO : Regional Unit) Agricultural Finance Consultants Limited, Chhatrapati Shivaji MaharajMarg, Bombay 400 039 (Maharashtra)	Rajathan, Uttar Pradesh, Haryana and Delhi.
4.	Coordinator (SFSO: Regional Unit) Indian Institute of Forests Management, Nehru Nagar Bhopal 462 003 (Madhya Pradesh)	Madhya Pradesh and Orissa
5.	Coordinator (SFSO: Regional UNit) Indian Institute of Management Sastrapur Ahmedabad-380 015 (Gujarat).	Gujarat, Maharashtra and Goa

6. Coordinator
(SFSO: Regional Unit)
North-Eastern Hill
University,Lower Lachumjene
Shillong 793 001
(Meghalaya)

Assam, Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland and Tripura.

7. Coordinator
(SFSO : Regional Unit)
Jadavpur University
Post Box 17026
Calcutta-700 032
(West Bengal)

Bihar, West Bgnal and Sikkim.

Autonomous Agencies

a) Environment Wing

1. Central Pollution Control Board
Parivesh Bhavan
CBD-cum-office Complex
East Arjun Nagar
Delhi-110 032.

2. Gobind Ballabh Pant Institute
of Himalayan Environment and
Development, Kosi, Katarmal,
Almora-263 643 (U.P.)

b) Forest Wing

1. Andaman and Nicobar Islands
Forests and Plantation Development
Corporation Ltd., Van Vikas Bhavan,
Port Blair,
Andaman and Nicobar Islands.

2. Indian Institute of Forest Management
Tumkur Road
Bangalore 560 022.

3. Indian Plywood Research Institute
Tumkur Road
Bangalore 560 022

4. Indian Council of Forestry Research and Education
P.O. New Forests
Dehradun-248 006.

c) Wildlife Wing

1. Wildlife Institute of India
Chandrabani,
Dehradun-248 006

2. Animal Welfare Board of India
4th Street, Abhiramapuram
Madras-600 018 (Tamil Nadu)

Associated Units

a) Environment Wing

1. Botanical Survey of India
P-8 Brabourne Road
Calcutta-700 001

2. Zoological Survey of India
M-Block, New Alipur
Calcutta-700 001

3. National Museum of Natural History
FICCI Building
Barakhamba Road
New Delhi-110 001

b) Forest Wing

1. Forest Survey of India
25, Subhash Marg
Dehradun-248 006

2. Indira Gandhi National Forest Academy
P.O. New Forests
Dehradun 248 006 (U.P.)

3. Forest Research Institute
P.O. New Forests
Dehradun-240 006 (U.P.)

4. Institute of Forests Genetics and
Tree Breeding, Forest College Campus,
P.B. No. 1031, R.S. Puram,
H.P.O. Coimbatore-641 002.
(TamilNadu)

5. Institute of Wood Science and Technology,
18th cross, Malleswaram
Bangalore 560 002 (Karnataka)

6. Institute of Arid Zone Forestry Research
12/10, Chopasani Housing Scheme,
Jodhpur 342 008 (Rajasthan)

7. Insittue of Deciduous Forests
P.O. RFRC, Mandla Road
Jabalpur 482 021 (Madhya Pradesh)

8. Insitute of Rain and Moist Deciduous
Forest Research, Jorhat (Assam)

c) Wildlife Wing

1. Nationial Zoological Park
Mathura Road
New Delhi-110 003.

Regional Offices

1. Wildlife Preservation
   Western Region
   11 Air Cargo Complex
   Sahar, Bombay-400 099.

2. Wildlife Preservation
   Eastern Region
   Nizam Palae
   6th floor, MS Building
   234/4, A.J.C. Bose Road
   Calcutta 700 020

3. Wildlife Preservation
   Northern Region
   Bikaner House, Shahjahan Road,
   New Delhi-110 011.

4. Wildlife Preservation
   Southern Region
   2C/5, Brownstone Apartments
   Madras 600 034

ENVIS CENTRES

	Institution	Area	
1.	Dr. S.P. Chakraborty Member Secretary Central Pollution Control Board Parivesh Bhawan, CBD cum Office Complex, East Arjun Nagar, Delhi-110 092.	Control of Pollution (Water, Air & Noise)	Tele (011) 2217213, 2217078 Grams : CLEANENVIRON Telex : 031-66440 PCO-IN
2.	Dr. P.N. Viswanathan Scientist 'F' Industrial Toxicology Research Centre, Mahatma Gandhi Road Lucknow-226 001 (U.P.)	Toxic Chemicals	Tel. : (0522) 248227, 248228, 247586, 240106 Telex : 535-456 ITRC IN Grams : INTOXI, LUCKNOW
3.	Dr. Ashok Khosla President Development Alternatives B-32, Institutional Area Tara Crescent, New Mehrauli Road Hauz Khas, New Delhi-110 016.	Environmentally Sound & Appropriate Technologies	Tel : (011) 665370, 65793 Telex : 031-7316 DALT IN Delhi Fax : 91-11-6866031
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6.	Prof. Raghavendra Gadagkar, Chairman Centre for Ecological Sciences, Bangalore-560 012 (Karnataka)	Western Ghats and Biological Diversity	Tel. : (91-812) 340985 Grams : "Science" Malleswaram Bangalore Telex : 0875-8349 Fax : 91-812-341683 E-Mail Cesgre-a-cesiscemet in

7. Sh. S.K. Puri, Project Director, World Wide Fund for Nature 172B, Lodi Estate Max Mueller Marg New Delhi-110 003.	Non-Government Organisations, Media and Parliament Matters related to Environment	Tel : (011) 4627586, 4616532, 4693744 Grams : PANDAFUND Delhi Fax : 91-11-4626837
8. Executive Director Environmental Planning and Coordination Organisation, E5 Sector Arera Colony, Bhopal-462 016. (M.P.)	Environmental Management related to the State of Madhya Pradesh	Tel : (0755) 565869, 566970, 564501
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10. Dr. D.C. Ojha Senior Librarian Central Arid Zone Research Institute (CAZRI) Jodhpur-342 002 Rajasthan	Desertification	Grams : SUSHKHSHETRA
11. Dr. A.L. Paul Pandian Centre Incharge, Centre for Advanced Studies in Marine Biology, Annamalai University, Parangipettai 608 502, Tamil Nadu.	Mangroves, Estuaries, Lagoons and Coral Reefs	Tel : 04144-83223
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20. Shri T. Chatterjee Director Environment Protection Training & Research Instt., 2nd floor, Maitrivanam, Huda complex, S.R.Nagar, Hyderabad 500 038	Eastern Ghats	Tel : 040-291366, 290399 Fax : 040-291366

Annexure-VI

STATEMENT SHOWING THE ACTUAL EXPENDITURE/PHYSICAL ACHIEVEMENTS AND AID UTILIZATION OF EXTERNALLY AIDED PROJECTS AS ON CLOSING DATE

Sl. No.	Name of the Project	Aid Agency	Project Cost (Rs. in Cr.)	Project Period	Credit Closing Date	Actual Expdtr. (Rs. in Cr.)	Physical Achievement (In ha.)	Foreign Currency (In M)	Aid Component	Aid utilised
1.	Social Forestry Project Maharasthra	USAID	56.48	1982-83 to 9/90	9/90	85.21	41751 508 MSDL	US$	loan 18.59	18.590
2.	Social Forestry Project Andhra Pradesh	CIDA	38.38	1983-84 to 1990-91	3/91	42.76	45217 3261 RKM 318 MSDL	C$	Grant 17.28 Loan 10.12	17.281 10.13
3.	Social Forestry Project Bihar	SIDA	53.85	1985-86 to 1991-92	3/92	48.68	53375	SEK Kr.	Grant 127.00	80.898
4.	Social Forestry Project J & K and Haryana	W.B.	57.07	1982-83 to 1990-91	3/91	106.19	186281	SDR	Loan 29.40	29.402
5.	Social Forestry Project West Bengal	W.B.	34.75	1981-82 to 1990-91	3/91	64.00	242576	SDR	Loan 25.63	25.627
6.	Social Forestry Project Karnataka	W.B./DDA	55.23	1983-84 to 1991-92	3/92 3/92	85.21	41751 508 MSDL	SDR	Loan 23.40	23.400
7.	Social Forestry Project Kerala	W.B.	59.51	1984-85 to 1992-93	3/93	89.68	131000	SDR	Loan 26.10	24.798
8.	National Social Forestry Project (UP, HP, Raj, Guj)	W.B./ USAID	387.91	1985-86 to 1992-93	3/93	698.18	1198742	SDR US $ Grant	Loan 155.40 16.40	155.400 16.400
9.	Orissa Social Forestry Project	SIDA	28.17	1983-88	3/88	27.06	33592	SEK Kr.		229.38
	Total		770.65			1246.89				

Abbreviation :

MSDL-Million Seedlings distributed.
WB-World Bank
ODA-Overseas Dev. Administration.
SIDA-Swedish International Development Authority
CIDA-Canadian International Dev. Agency
USAID-US Agency for International Development

Annexure-VII

EXTERNALLY AIDED PROJECTS IN THE PIPELINE

Sl. No	Name of the Project	Implementing Agency	Funding Agency	Nature of Project (theme)	Size of Indian Rupees (Project Cost) (Rs. in Crores)	Project period No. of years	CurrentStatus exact positicn
1	2	3	4	5	6	7	8
1.	Madhya Pradesh Forestry Project	M.P. Govt.	World Bank	Forestry Development	Stage-I 276.6 Stage-II 519.00	4 years	Appraised in March-April 1994, due for Negotiation.
2.	Forestry Development Project	Rajasthan Govt.	DECF	Forestry Development	139.00	5 years	Appraised by DECF in May 1994.
3.	Bihar Forestry Project	Bihar Govt.	World Bank	Forestry Development	157.00	6 years	Pre-appraised by the World Bank in May-June, 1994 Likely to be appraised in Sept. 95
4.	U.P. Forestry Project	U.P. Govt.	World Bank	Forestry Development	500.00	6 years	The World Bank Consultants have started preparing draft final report.
5.	Social Forestry Project Phase II	Kerala Govt,	World Bank	Forestry Development	120.00	5 years	--do--
6.	Orissa Forestry Project.	Orissa Govt.	SIDA	Forestry Development	256.00	5 years	SIDA consultant is preparing final report
7.	Shimla Development Project	H.P. Govt.	SIDA	Forestry Development	100.00	7 years	--do--

Annexure-VIII

EXTERNALLY AIDED PROJECTS UNDER PREPARATION/PROCESSING FOR POSING TO AGENCIES

S.. No	Name of the Project	Implementing Agency	Funding Agency	Nature of Project (theme)	Size of Indian Rupees (Project Cost) (Rs. in Crores)	Project period	Stage of Process exact position
1.	Gujarat Forestry Project	Gujarat Govt.	World Bank	Forestry Development	682.00	5 years	Earlier posed to the World Bank but not accepted, Being processed for posing to another donor agency
2.	Forest and Wildlife Project	H.P. Govt.	World Bank	Forestry Development	178.94	5 years	--do--
3.	Forestry and Environment Project for Eastern Plains	Karnataka Govt.	-	Forestry Development	264.31	5 years	--do--
4.	Conservation & Development of Forests.	T.N. Govt.	-	Forestry Development	300.00	5 years	State Govt. has been requested to revise,
5.	Social Forestry Punjab	Punjab Govt.	-	Social Forestry	175.72	6 years	State Govt. has been requested to revise
6.	Meghalaya Eco-Resource Dev. Project.	Meghalaya Govt.		Forestry Development	86.46	10 years	Under processing
7.	Eco-Development Project.	Karnataka		Forestry Development	25.63	7 years	Being revised by State Govt.
8.	Forestry Project	Assam		Forestry Development	744.93	10 years	Under examination
9.	Nagaland Project	Nagaland		Forestry Development	41.25	5 years	Under examination
10.	Pasture Seed Production in Sikkim	Sikkim	FAO	Forestry Development	1.28	2 years	Posed to FAO through M.D.A.

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