REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

FOR THE YEAR ENDED 31 MARCH 1994

NO.6 OF 1995

UNION GOVERNMENT
(SCIENTIFIC DEPARTMENTS)

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Preface

This Report for the year ended 31 March 1994 has been prepared for submission to the President under Article 151 of the Constitution.

This volume covers matters arising from test audit of the transactions of the Scientific Departments of the Union Government, the Autonomous Bodies funded by these Departments and some major scientific organisations associated with some other Departments.

The Report includes audit reviews on the following :

i) Giant Metrewave Radio Telescope, Pune
ii) Department of Biotechnology
iii) Ganga Action Plan
iv) Forest Survey of India, Dehradun
v) Bose Institute, Calcutta
vi) National Bureau of Plant Genetic Resources, New Delhi
vii) Central Fuel Research Institute, Dhanbad

Of the audit reviews, the one on 'Ganga Action Plan' relates to the Ministry of Environment & Forests. This is an All-India review incorporating the results of test audit by Accountants General of three states and test check of the Ministry's records.

The cases mentioned in this Report are those which came to notice in the course of audit during 1993-94 and early part of 1994-95. For the sake of completeness, matters relating to earlier years which could not be covered in the previous Reports are also included. Similarly results of audit of transactions subsequent to 1993-94 have also been mentioned wherever available and relevant.

In 1992-93, R&D expenditure of the major Scientific Departments and agencies of Government of India was Rs 2788.02 crores of which Defence Research and Development Organisation (DRDO), Department of Space (DOS), Indian Council of Agricultural Research (ICAR), Department of Atomic Energy (DAE) and Council of Scientific and Industrial Research (CSIR) accounted for more than Rs 2235 crores. The share of the private sector in the total R&D expenditure of the country in 1992-93 continued to be low at 15 **per cent**. R&D expenditure of Government of India as percentage of GNP showed a marginal decline from 0.93 **per cent** in 1989-90 to 0.83 **per cent** in 1992-93, though India continues to be one of the highest spenders in R&D among the developing countries.

The important results of audit of the Scientific Departments and agencies of Government of India (except DRDO) are set out in this overview.

Department of Atomic Energy

(i) Giant Metrewave Radio Telescope

In April 1984, the Tata Institute of Fundamental Research proposed the setting up of a "Giant Metrewave Radio Telescope" to search for red-shifted cold hydrogen clouds which existed before the formation of stars and galaxies, which if detected, would pave the way for explaining the mystery of evolution of the universe; to search and study millisecond pulsars for testing the general theory of relativity; and to explore radio galaxies, quasars and other objects in outer space.

Government of India approved the proposal in 1985 and issued a sanction for Rs 22 crores in 1987. The project was to be completed by June 1992.

The expenditure on the project was Rs 42.66 crores (March 1994), almost twice the estimated cost of Rs 22 crores. Increase in cost was mainly due to changes in design, delay in installation and erection of antennae and lack of an effective monitoring system. Delay in project schedule resulted in payment of extra fees of Rs 0.68 crore to the consultant. Further revision of cost, to Rs 45 crores, is under consideration of Government.

Till March 1994, only four antennae were commissioned as against 30. Nine sets of servo system as against 30 could be delivered by BARC till April 1993. For the remaining 21 sets, BARC transferred the know-how to TIFR but the servo system had not been developed by TIFR (November 1994), resulting in delay in installation. Non-installation of 86 out of 122 gear boxes purchased in 1992 resulted in blocking of capital of Rs 1.88 crores for the past two years without any off-setting benefit. Out of 65 laser diodes valued at Rs 0.19 crore imported in September 1991, only 20 had been installed till June 1994. To sum up, despite heavy expenditure on the project its commissioning in the near future appears to be a remote possibility.

(Para 2.1)

Department of Biotechnology

(ii) Audit Review of the Department

In February 1982, the National Biotechnology Board (NBTB) was set up under the Department of Science and Technology (DST) for integrated development of the discipline of Biotechnology. The Department of

Biotechnology (DBT) was constituted in February 1986 as successor to NBTB.

58 (out of 470 approved) projects were test checked in Audit. It was noticed that only 12 projects of these were completed till March 1994. 19 projects had not been peer reviewed before approval. 4 projects were prematurely terminated after incurring an expenditure of Rs 1.17 crores.

Grant of Rs 2.06 crores was released to IDPL upto March 1991 for the Antibiotic Development Consortium out of which Rs 1.37 crores remained unutilised (December 1994) with the company. Grant of Rs 3.46 crores was given to Hindustan Antibiotics Limited under the consortium but the question of receipt of royalty from the company remained unresolved.

Major cost overrun was noticed in the case of a project at Tata Energy Research Institute which was due to be completed in 1993-94 but was extended upto 1997. The cost was revised from Rs 4.65 crores to Rs 12.40 crores. In the case of a building under construction at Pune, the cost estimate went up from Rs 1.25 crores to Rs 14.33 crores.

Upto 1993-94, only one technology developed from DBT assisted projects, had been patented and computerised project monitoring system introduced in 1988 was only partially utilised.

(Para 3.1)

Department of Electronics

(iii) Non-commissioning of equipment

A foreign equipment was received in July 1992 by the Society for Applied Microwave Electronics Engineering and Research (SAMEER) for a project sponsored by DOE to study opto-electronic circuits. Arsine and phosphine gases

imported for the equipment had to be returned to the supplier since the cylinders were not as specified and hence not cleared by the customs authorities. Part payment of Rs 2.58 crores made to ET&T through which the import had been made, remained blocked for over two years as the equipment could not be installed.

(Para 4.1)

Ministry of Environment and Forests

(iv) Ganga Action Plan (GAP)

An Action Plan for prevention of pollution of the river Ganga was prepared by the Department of Environment in December 1984. For implementation of the Ganga Action Plan, the Central Ganga Authority was constituted in February 1985 which lays down policies and programmes to be taken up under GAP.

261 schemes with an estimated cost of Rs 272 crores had been sanctioned for GAP Phase-I. The estimates were revised to Rs 468.04 crores in August 1994. Expenditure of Rs 371.13 crores had been incurred upto 31 March 1994 and 31 schemes remained incomplete as on that date. Out of 31 incomplete schemes, 25 were delayed by more than 3 years beyond the targets initially fixed. The cost escalation was attributed to delay in completion of the schemes because of non-availability of land in time, dispute with contractors and change in design and scope of the works.

Against the target of 664 million litres of sewage per day to be intercepted and treated under GAP Phase-I in the five cities of Kanpur, Allahabad, Varanasi, Patna and Calcutta (including Howrah), an average of only 396 million litres per day (MLD) was intercepted and 182 MLD was treated during October 1993 to March 1994.

Expenditure of Rs 9.04 crores was incurred by the implementing agencies for purposes not approved by GPD. Governments of UP and Bihar diverted GAP funds amounting to Rs 7.25 crores for meeting their share of expenditure on operation and maintenance of MPS and STPs.

Five sewage interception and diversion schemes in Calcutta and Howrah remained incomplete due to encroachment of land, resistance by public, court injunctions as well as change in the scope of the works.

Two Sewage Treatment Plants (STPs) in Kanpur, one in Allahabad, three in Patna and four in Calcutta and Howrah were incomplete as on 31 March 1994. In one STP scheme in Calcutta, extra liability of Rs 1.57 crores had to be incurred because of delay in acceptance of tenders. In another scheme in West Bengal, extra expenditure of Rs 28.61 lakhs was incurred because of procedural delay in obtaining sanction from GPD. In one scheme in UP, delay on the part of the contractor to procure a dual fuel generating set led to extra liability of Rs 42.15 lakhs.

GPD had estimated the annual cost of O&M of STPs at Rs 13.5 crores per year of which Rs 6.2 crores was expected to be set off from recovery of resources. Test check in audit indicated that the likelihood of recovery of the anticipated revenue was remote.

The data collected by GPD for monitoring the quality of water was at variance with the results of CPCB mainly due to the fact that uniform practices were not followed for collection of data. While dissolved oxygen (DO) and biochemical oxygen demand (BOD) were within the permissible limits except at Kanpur, bacterial load (coliform count) was much in excess of the prescribed standards at all sampling

points. The schemes under GAP did not provide for control of bacterial load.

(Para 5.1)

(v) Forest Survey of India

In 1965, the Pre-Investment Survey of Forest Resources (PISFR) was created to undertake aerial photo-interpretation and forest mapping. In 1981, PISFR was converted to Forest Survey of India (FSI) which was reorganised in 1986 with the objective of preparing state of the Forest Report including National Vegetation Map once every two years by using remote sensing data.

The expenditure on the scheme "Application of Remote Sensing Techniques in Survey of Forests" was Rs 7.45 crores (March 1994), almost twice the sanctioned cost of Rs 4 crores. Approval of the Expenditure Finance Committee was not taken for the revised cost of the project. The digital image processing system procured at a cost of Rs 1.22 crores became operational in 1989 but digital analysis work could be undertaken only from 1991-92. A digital cartographic system, estimated to cost Rs 1.25 crores was to be procured as part of the scheme. The procurement was still being processed, the estimated cost of the equipment being Rs 7.75 crores in August 1994.

Data regarding the forest cover presented in the State of Forest Reports (SFRs) till 1991 were based on visual interpretation; only in the 1993 SFR, was part of the data based on digital interpretation.

The objective of creation of the National Basic Forest Inventory System was not achieved.

Improved methodology for forest mapping, inventory design and ground truth verification was still being developed.

(Para 5.2).

Ministry of Mines

(Geological Survey of India)

(vi) Avoidable payment of customs duty

Before importing three "Geologers" for research activities in June 1986, Geological Survey of India did not apply for the "Not manufactured in India" and the customs duty exemption certificate and consequently had to pay customs duty of Rs 11.50 lakhs on the import. The claim for refund was preferred after 35 months instead of within the permissible limit of 12 months from the date of payment of duty and no refund was received till October 1994.

(Para 6.1)

Indian Council of Agricultural Research

(vii) National Bureau of Plant Genetic Resources

In 1976, a National Bureau of Plant Genetic Resources (NBPGR) was established to conserve the genetic variability of cultivated plants and their wild relatives essential for crop improvement programmes.

Most of the projects were continuing long after the period for which they were sanctioned. Annual progress reports of the research projects were not being sent to ICAR. The quinquennial review team did not furnish the final report of the review conducted for the period upto December 1990.

No account was kept of equipment worth Rs 3.10 crores received under the Indo-USAID Plant Genetic Resources Project. Funds received from IBPGR for seven projects had not been accounted for by NBPGR.

No records were kept at Issapur farm of the number of accessions received for evaluation and the number actually evaluated. No target had been fixed for evaluation.

Feedback on the evaluation and multiplication of imported germplasm was not received in many cases from the indentors and it was not clear if the samples served the purpose for which they were imported.

Crop catalogues had not been prepared in respect of some important crops like wheat, paddy, groundnut.

No facility had been created for medium term storage of germplasm in the concerned institutions. Internal audit was not being conducted for want of trained staff.

(Para 9.1)

(viii) Blocking of Funds

Pending finalisation of the preliminary estimate, Central Inland Capture Fisheries Research Institute deposited Rs 15.73 lakhs to CPWD in April 1990 for construction of a building. Administrative approval and expenditure sanction for the work were accorded by ICAR only in March 1994 on the basis of the revised preliminary estimate prepared by CPWD in February 1994. Payment of Rs 15.73 lakhs by CICFRI resulted in blocking of funds without any benefit.

(Para 9.2)

(ix) Delay in installation of equipment

Between June and December 1990, the Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore procured equipments valued at Rs 8.66 lakhs for a gene bank. The essential instruments required for the gene bank were, however, identified only in April 1994 and were awaiting procurement action and the equipments procured earlier were not operational.

(Para 9.3)

Council of Scientific and Industrial Research

(x) Central Fuel Research Institute

In 1950, the Central Fuel Research Institute (CFRI), Dhanbad was established to undertake research, both fundamental and applied, on India's fuel resources, specifically on coal and lignite, to assess their quality and their potential uses in the most efficient manner.

Audit of CFRI revealed cases of delay in completion of projects and absence of feedback from the end users on the processes developed in the Institute. There was no systematic monitoring and evaluation of projects after September 1992. Equipments worth Rs 33 lakhs remained idle for periods ranging from 36 to 51 months for want of repairs. Physical verification of stores was not conducted after 1989.

(Para 10.1)

(xi) Infructuous expenditure on purchase of equipment

The Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar imported two equipments at a cost of Rs 8.37 lakhs during January - March 1989 for a project on carbonylation of olefins. The equipments were

actually not required for the project nor were utilised for any other purposes, rendering the expenditure infructuous.

(Para 10.3)

LIST OF ACRONYMS

AC	: Academic Council
ATN	: Action Taken Note
BCCL	: Bharat Coking Coal Limited
BARC	: Bhabha Atomic Research Centre
BIBCOL	: Bharat Biological and Immunological Corporation Limited
BOD	: Biochemical Oxygen Demand
BRJP	: Bihar Rajya Jal Parshad
CAT	: Centre for Advanced Technology
CCT	: Computer Compatible Tape
CESC	: Calcutta Electric Supply Corporation
CFRI	: Central Fuel Research Institute
CGA	: Central Ganga Authority
CICFRI	: Central Inland Capture Fisheries Research Institute
CMC	: Computer Maintenance Corporation
CMDA	: Calcutta Metropolitan Development Authority
CMPDIL	: Central Mine Planning and Design Institute Limited
CMRS	: Central Mining Research Stations
CPCB	: Central Pollution Control Board
CPWD	: Central Public Works Department
CRIJAF	: Central Research Institute for Jute and Allied Fibres
CSIR	: Council of Scientific and Industrial Research
CSMCRI	: Central Salt and Marine Chemicals Research Institute
CWC	: Central Water Commission
DAE	: Department of Atomic Energy
DARE	: Department of Agricultural Research and Education
DBT	: Department of Biotechnology
DGS&D	: Directorate General of Supplies and Disposals
DO	: Dissolved Oxygen
DRDO	: Defence Research and Development Organisation
DST	: Department of Science and Technology
EC	: Electric Crematoria

EFC	:	Expenditure Finance Committee
ET&T	:	Electronics Trade & Technology Development Corporation Ltd
ETP	:	Effluent Treatment Plant
FRI	:	Forest Research Institute
FSI	:	Forest Survey of India
GAC	:	Germplasm Advisory Committee
GAP	:	Ganga Action Plan
GMRT	:	Giant Metrewave Radio Telescope
GNP	:	Gross National Product
GPD	:	Ganga Project Directorate
HAL	:	Hindustan Antibiotics Limited
IARI	:	Indian Agricultural Research Institute
IBPGR	:	International Bureau on Plant Genetic Resources
ICAR	:	Indian Council of Agricultural Research
ICGEB	:	International Centre for Genetic Engineering and Biotechnology
ICMR	:	Indian Council of Medical Research
ID	:	Interception and Diversion
IDPL	:	Indian Drugs and Pharmaceuticals Limited
IMC	:	Internal Management Committee
ITI	:	Indian Telephone Industries
ITRC	:	Industrial Toxicological Research Centre
IVCOL	:	Indian Vaccine Corporation Limited
LCS	:	Low Cost Sanitation
MC	:	Management Council/Monitoring Committee
MEF	:	Ministry of Environment and Forests
mg	:	Milligramme
ml	:	Millilitre
Mld	:	Million litres per day
MMB	:	Missoion Management Board
MNES	:	Ministry of Non-conventional Energy Sources
MOU	:	Memorandum of Understanding
MPS	:	Main Pumping Station
NBFIS	:	National Basic Forest Inventory System
NBPGR	:	National Bureau of Plant Genetic Resources

NBTB : National Biotechnology Board
NFATCC : National Facility for Animal Tissue and Cell Culture
NFDMC : National Forest Data Management Centre
NII : National Institute of Immunology
NRSA : National Remote Sensing Agency
O&M : Operation and Maintenance
p.a. : per annum
PERT : Performance Evaluation and Review Technique
PI : Principal Investigator
RC : Research Council
R&D : Research and Development
RFD : River Front Development
SAC : Scientific Advisory Committee
SAMEER : Society for Applied Microwave Electronic Engineering and Research
S&T : Science and Technology
SAW : Surface Acoustic Wave
SPCB : State Pollution Control Board
SRC : Scientific Research Council
SRC : Solvent Refined Coal
STP : Sewage Treatment Plant
TC : Tender Committee
TCE : Tata Consultancy Engineers
TERI : Tata Energy Research Institute
TIFR : Tata Institute of Fundamental Research
UP : Uttar Pradesh
UPJN : Uttar Pradesh Jal Nigam
WB : West Bengal

CHAPTER I

1.1 Introduction

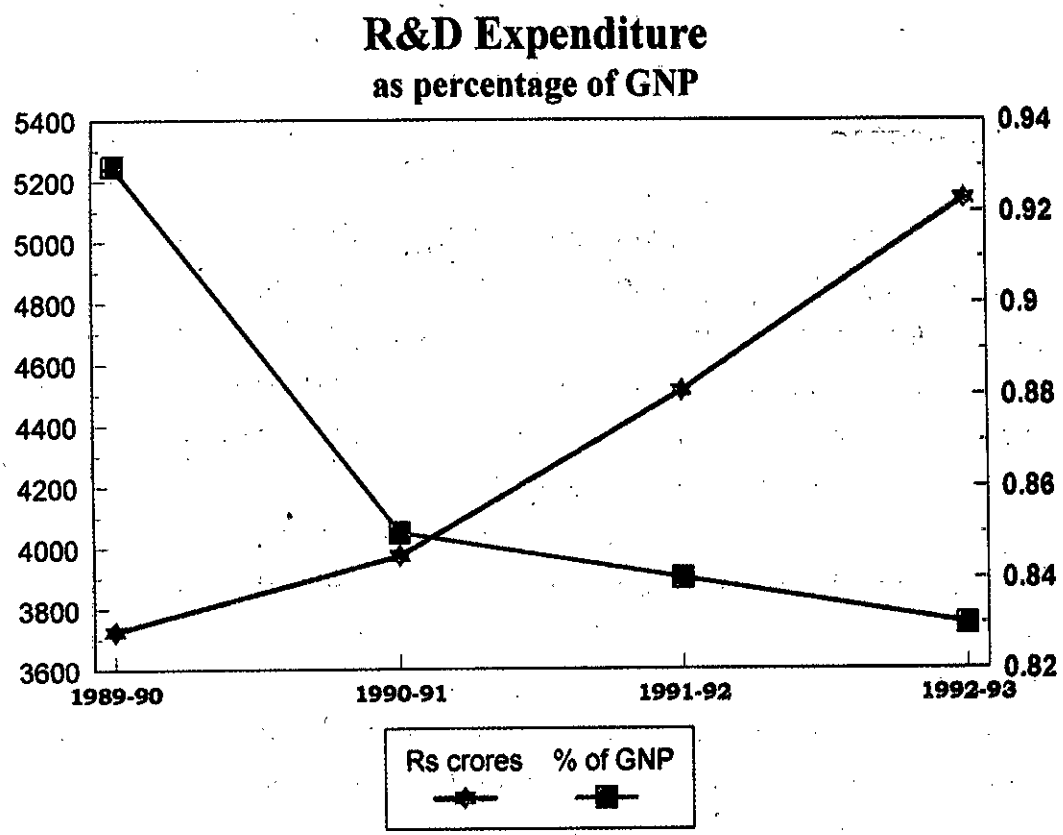
1.1.1 In pursuance of the national objective of making scientific and technological progress and attaining self-reliance, Government of India have been making consistent efforts to foster Research and Development **(R&D)** activities. The Plan allocation for science and technology **(S&T)** increased from Rs 14 crores in the First Plan to Rs 9180 crores in the Eighth Plan. The efforts have resulted in development of infrastructure in diverse fields of S&T.

1.1.2 While Government has been making higher allocation for R&D every year and expenditure has also been increasing, the actual expenditure on R&D as a percentage of Gross National Product **(GNP)** has been showing a slight decline over the past few years, as shown below:

Year	GNP (at factor cost)	R&D expenditure	Expenditure on R&D as percentage of GNP
	(Rs in crores)		
1989-90	402930	3725.74	0.93
1990-91	468059	3974.17	0.85
1991-92	540143	4512.81	0.84
1992-93	616504*	5141.64	0.83

* quick estimate

With R&D expenditure at almost one **per cent** of GNP, India is among the highest spenders on R&D among the developing countries. Developed countries generally spend around 2.5 **per cent** of GNP on R&D.

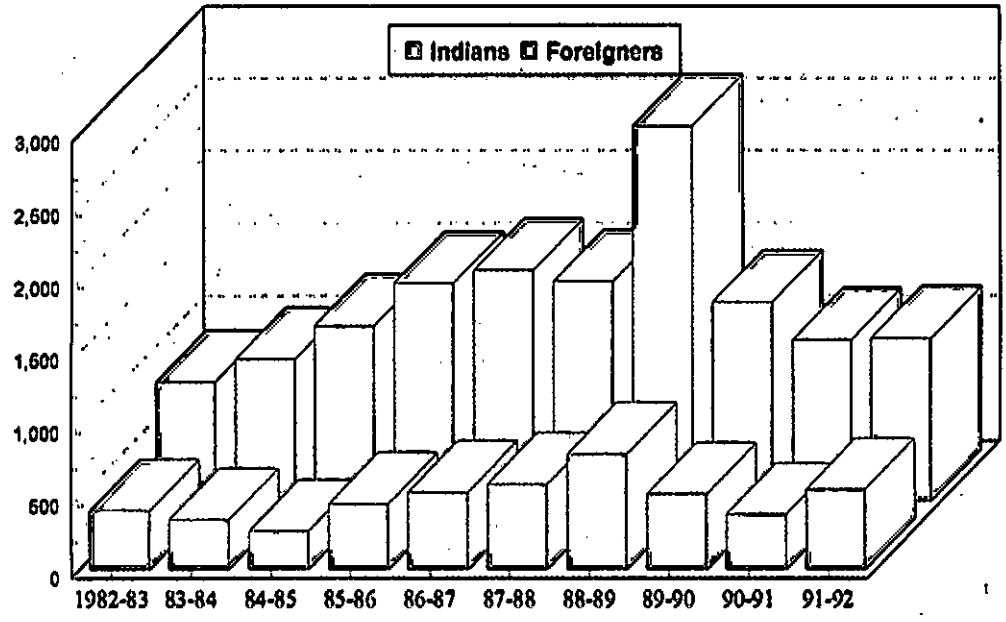


1.1.3 A necessary pre-requisite of S&T development is availability of S&T personnel in the country. According to an estimate published by Government, there were more than 38 lakh people with science and engineering qualifications in India in 1990 i.e. about 449 per lakh population. The number of scientists and engineers engaged in R&D activities was, however, estimated at only 15 per lakh in that year which underscores the necessity of further efforts to enlarge the scope of R&D activities in the country and to harness the qualified manpower resources more fruitfully. Number of scientists and engineers engaged in R&D activities is more than 200 per lakh in the developed countries.

1.1.4 The number of patents sealed in the country which is a measure of the efficacy of R&D efforts showed a steady increase during 1980's upto 1988-89 after which there was a

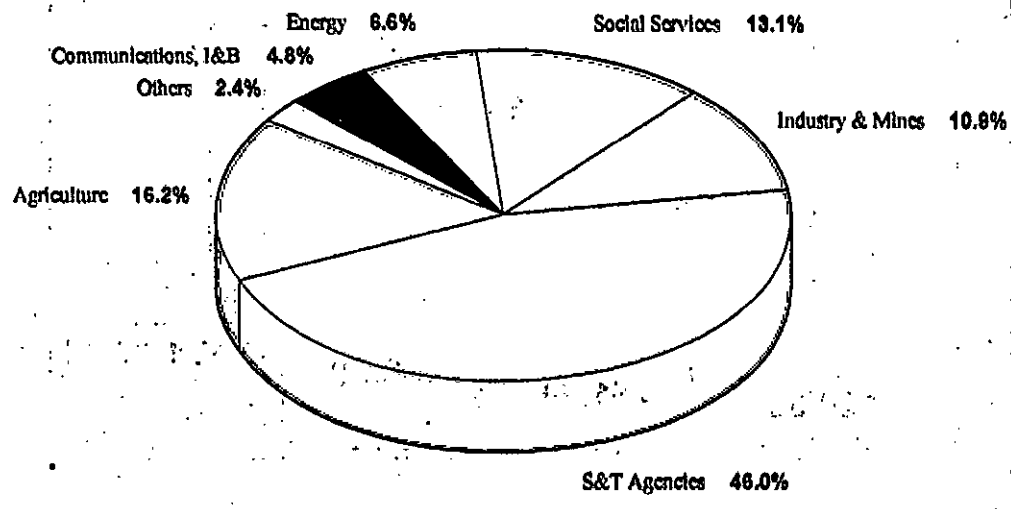
decline upto 1990-91. The position is depicted in the graph below. The number of patents sealed in the name of foreigners continued to be much higher than that by Indians throughout the period.

PATENTS SEALED
BY INDIANS & FOREIGNERS



1.1.5 Percentage share of Eighth Plan S&T allocation by sectors was as follows:

S&T Allocation in VIIIth Plan
Percentage share of Socio-Economic Sectors

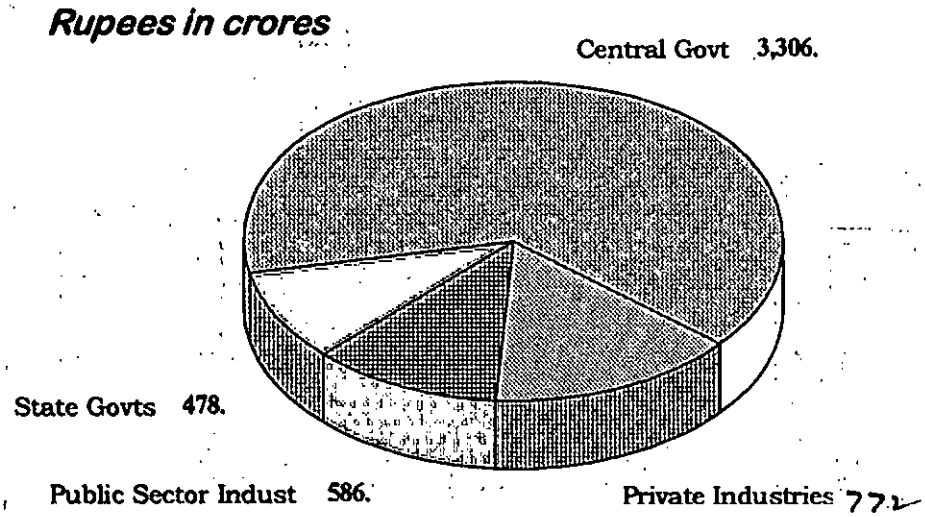


1.1.6 R&D activities

A characteristic feature of India's expenditure on R&D is that most of the R&D funding is in the Government sector, as shown in the graphs below:

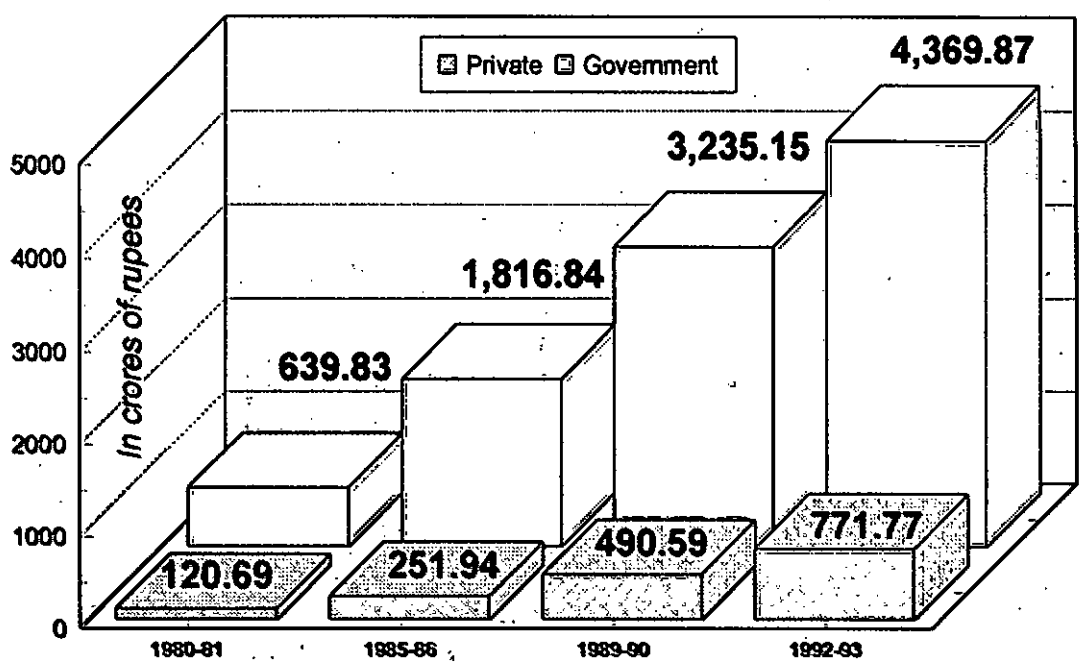
NATIONAL R&D EXPENDITURE

Share of financial inputs, 1992-93

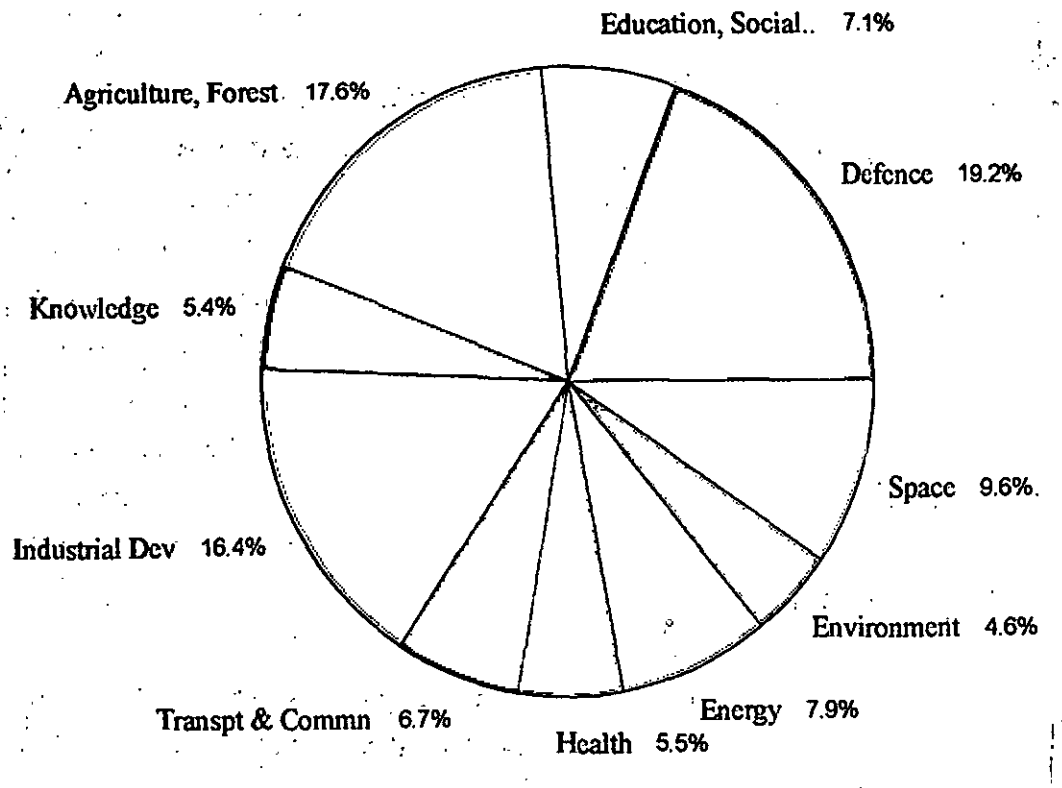


National R&D Expenditure

SOURCES OF FUNDING



Share of national R & D expenditure by different objectives was as follows :



The share of R&D expenditure among the 12 major scientific agencies of Government of India was as follows in 1992-93:

Agency	**Actual (Rs in crores)**	**Percentage**
Defence Research and Development Organisation **(DRDO)**	793.00	28.4
Department of Space **(DOS)**	490.92	17.6
Indian Council of Agricultural Research **(ICAR)**	338.05	12.1
Department of Atomic Energy **(DAE)**	316.60	11.4
Department of Science & Technology **(DST)**	160.62	5.8
Council of Scientific and Industrial Research **(CSIR)**	296.29	10.6
Ministry of Environment and Forests	217.88	7.8

Department of Biotechnology **(DBT)**	58.90	2.1
Indian Council of Medical Research **(ICMR)**	42.84	1.5
Ministry of Non-Conventional Energy Sources **(MNES)**	13.89	0.5
Department of Ocean Development **(DOD)**	40.94	1.5
Department of Electronics **(DOE)**	18.09	0.7
Total	2788.02	100.0

1.1.7 Significant achievements during 1993-94

- The most important event of the year was the first developmental launch of the indigenously designed Polar Satellite Launch Vehicle (PSLV-DI) on 20 September 1993 from Sriharikota. Earlier, INSAT-2B was successfully launched and commissioned on 23 July 1993 on board the European Launch Vehicle Ariane and declared operational on 10 August 1993 after a series of complex orbit raising and deployment operations followed by complete check out of the payloads.

- Electronic Hardware Technology Park (EHTP) Scheme designed to attract investments into export-oriented electronics production became effective from April 1993 and a number of units have commenced production.

- Cross flow turbine technology to generate electricity in remote hilly areas was developed and tried out in different locations.

- A process for preparing a non-toxinogenic oral vaccine for cholera has been perfected at the Indian Institute of Chemical Biology, Calcutta.

- Techniques for pre-natal diagnosis for thalassemia based on Deoxyribonucleic Acid (DNA) analysis has been developed and tested successfully in 50

pregnancies at the Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh.

- The Twelfth Indian Scientific Expedition to Antarctica consisting of 56 members returned on 22 March 1993 after successfully concluding scientific experiments. The Thirteenth Indian Scientific Expedition to Antarctica sailed from Goa on 7 December 1993.

- Waste Immobilisation Plant (WIP) at Tarapur became operational during the year. Very few countries of the world possess this technology.

- Unit I of Kakrapar Atomic Power Station was declared commercial in May 1993.

1.1.8 Coverage under the Report

The comparative position of the expenditure of the major scientific departments/organisations, covered under this Report, during the year 1993-94 and in the preceding two years is given below:

Ministry/Department/ Organisation	1991-92	1992-93	1993-94
		(Rs in crores)	
1. Atomic Energy	1279.06	1399.09	1804.38
2. Space	457.45	490.92	689.55
3. Indian Council of Agricultural Research	328.60	355.46	441.99
4. Environment and Forests including Zoological Survey of India and Botanical Survey of India	297.21	316.84	369.93

5.	Department of Scientific and Industrial Research (including grants given to Council of Scientific and Industrial Research)	258.08	286.38	338.86
6.	Science and Technology including Survey ofIndia and India Meteorological Department	251.34	278.17	331.60
7.	Non-Conventional Energy Sources	128.85	126.56	201.45
8.	Geological Survey of India (Ministry of Mines)	91.18	105.14	116.08
9.	Electronics	121.10	87.12	166.95
10.	Biotechnology	64.03	76.13	81.04
11.	National Informatics Centre (Planning Commission)	41.12	58.16	56.87
12.	Ocean Development	39.83	45.53	47.52
13.	Centre for Development of Telematics (C-DOT) (Deptt.of Telecommunications)	25.80	42.06	39.74
14.	Indian Council of Medical Research	46.97	53.94	57.70
		3430.62	3721.50	4743.66

Important results of the audit of public money spent by these agencies and the institutions controlled by them which engage predominantly in the pursuit of science and technology, have been given in this Report.

1.1.9 Excess and savings in expenditure

The summary of Appropriation Accounts, i.e. expenditure during 1993-94 against approved demands (grants and appropriations), in respect of the scientific

departments/major scientific organisations mentioned above, is given below:

S. No.	Ministry/Deptt./ Organisation	Grant/ appropriation (including supplementary)	Expenditure	(-)Saving (+)Excess
			(Rs in crores)	
1.	Atomic Energy	2058.20	1804.38	(-)253.82
2.	Space	743.73	689.55	(-) 54.18
3.	Electronics	208.01	166.95	(-) 41.06
4.	Non-Conventional Energy Sources	208.02	201.45	(-) 6.57
5.	Biotechnology	88.10	81.04	(-) 7.06
6.	Science and Technology including Survey of India and India Meteorological Department	348.33	331.60	(-) 16.73
7.	Scientific and Industrial Research (including grants given to Council of Scientific and Industrial Research)	340.90	338.86	(-) 2.04
8.	Ocean Development	56.41	47.52	(-) 8.89
9.	Environment and Forests, including Zoological Survey of India and Botanical Survey of India	388.81	369.93	(-) 18.88
10.	Indian Council of Agricultural Research	423.75	441.99	(+) 18.24
11.	Indian Council of Medical Research	53.53	57.70	(+) 4.17
12.	Centre for Development of Telematics (Deptt. of Telecommunications)	60.60	39.74 (Provisional)	(-) 20.26
13.	National Informatics Centre (Planning Commission)	57.00	56.87	(-) 0.13
14.	Geological Survey of India (Ministry of Mines)	119.90	116.08	(-) 3.82

1.1.10 Adverse balance in the Finance Accounts

In Statement No. 13 of the Finance Accounts of the Union Government for the year 1993-94, there were adverse balances, as shown below, under various civil deposit heads, which should normally close with credit balances, as deposits are received as security deposits etc.

Ministry of Environment & Forests	**Rs in lakhs**
M H 8443 - Civil Deposits-Security Deposits	27.97 (Dr)
Departments of Space	
M H 8443 - Civil Deposits-Personal Deposits	41.60 (Dr)

In the last year's Audit Report, the same adverse balance had been pointed out for Department of Space while in the case of Ministry of Environment and Forests, the adverse balance reported was Rs 6.05 lakhs which went up during 1993-94. The debit balances, which could be due to mis-classification, excess refunds or non-reconciliation of accounts exceptionally even due to less innocent reasons, require urgent investigation and rectification.

1.1.11 Audit of Accounts of autonomous bodies

Accounts of autonomous bodies which received grants and loans from the Ministries and Departments of the Government are audited by the Comptroller and Auditor General of India under Sections 14, 19 & 20 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. Separate Audit Reports on their accounts are sent to them and their controlling Ministries and Departments. As on 31 March 1994, accounts of the 39 autonomous bodies receiving recurring grants from the Scientific Departments of Government of India,

as indicated in Appendix I, were required to be audited by the Comptroller and Auditor General of India. Out of this, accounts of the 14 autonomous bodies for the year 1993-94 have not been received for audit.

Under Section 19 (2) and Section 20 (1) of this Act, Separate Audit Reports on the accounts of five autonomous bodies viz. Indian Council of Medical Research, Wild Life Institute of India, Central Zoo Authority, Sree Chitra Tirunal Institute of Medical Sciences and Technology and Indian Council of Agricultural Research have been prepared and sent to them and to the concerned Departments/Ministries.

1.2 Outstanding Utilisation Certificates

Certificates of utilisation of grants are required to be obtained by the Ministries and Departments concerned from the grantees i.e. statutory bodies, non-government institutions etc. indicating that the grants had been utilised for the purpose for which they were sanctioned and that where the grants were conditional, the prescribed conditions had been fulfilled. Utilisation Certificates for grants amounting to Rs 1299.37 crores were outstanding (see details given in Appendix II). Some of the certificates are outstanding since 1976-77. The Departments would need to look into this at the highest level and obtain the certificates or recover the amounts.

1.3 Follow up action

A review of the "Action taken notes" **(ATNs)** received during 1993-94 revealed that the concerned Ministry/Department did not indicate adequate remedial/corrective action in respect of the following

paragraphs in the Report of the Comptroller and Auditor General of India: Union Government (Scientific Departments), No.2 of 1993 for the year ended 31 March 1992:

Para No.	Subject
2.2	Primary Coolant Pump **(DAE)**
2.5	Idling of Equipment **(DAE)**
2.6	Non-recovery of the share of State Government in a project **(DAE)**
7.1	Indian Association for the Cultivation of Science - audit review **(DST)**
7.4	Infructuous expenditure on research projects **(DST)**
8.1	Excess purchase of stores **(DOS)**
10.1	Acquisition of unsuitable land **(ICAR)**
11.1	Institute of Cytology and Preventive Oncology **(ICMR)**
12.2	Indian Institute of Petroleum **(CSIR)**
12.4	Central Mechanical Engineering Research Institute **(CSIR)**

Action taken notes are still awaited (December 1994) in respect of 14 paragraphs which appeared in the Audit Report of the Comptroller and Auditor General of India: Union Government (Scientific Departments) for the years ended 31 March 1989 to 1992.

In addition, ATNs on the following paragraphs which appeared in the Audit Report for the year ended 31 March 1993 have also not been received for final vetting. (December 1994).

Para No.	Subject
4.1	Audit Review of the Department **(DOE)**
5.1	Infructuous expenditure on hiring of accommodation **(MEF)**
6.1	Idling of a costly sophisticated system **(GSI)**
7.1	Biogas Development programme **(MNES)**
7.2	Undue benefit to a private firm **(MNES)**
8.1	Material Management **(NIC)**
9.1	Irregular purchase of vehicle **(DST)**
10.1	Physical Research laboratory **(DOS)**
10.2	Injudicious import of refrasil cloth **(DOS)**

10.3 Blocking of Capital on unutilised steel **(DOS)**
10.5 Avoidable expenditure due to defective purchase order **(DOS)**
11.1 Jute Technological Research Laboratories **(ICAR)**
12.1 Indian Institute of Chemical Biology **(CSIR)**.
12.2 National Geophysical Research Institute **(CSIR)**
12.3 Equipments lying idle **(CSIR)**
12.4 Excess expenditure for unconsumed power **(CSIR)**
12.5 Short recovery from private parties **(CSIR)**
13.1 Utilisation of Foreign Aid(Audit Review of projects in **MEF** and **MNES**)

However, in many cases the departments/organisations have taken remedial measures and improved systems and procedures at the instance of Audit. A few such instances are given below:

- Department of Ocean Development has introduced a monitoring system for the progress of the projects either by constituting a Technical Review Committee or holding regional evaluation workshop in various parts of the country.

- Central Mechanical Engineering Research Institute, Durgapur (a unit of CSIR) conducted preliminary studies before undertaking in-house projects. New projects are undertaken only after sufficient ground work and evaluation and after adequate survey of market potential so that the intended objectives are achieved.

- Electronic Research and Development Centre, a unit of Department of Electronics, reduced their maximum demand from 1000 KVA to 700 KVA from August 1992 and also obtained the concurrence of Kerala State Electricity Board to bring it down to 500 KVA in February 1994. The Centre has also conducted energy audit to ascertain the exact load factor.

- Department of Atomic Energy introduced a system of inspecting the works of untried contractors by an Inspection Team comprising Engineers in senior management level for proper assessment of their suitability and capability to undertake the particular works.

- Department of Space issued the instructions to the units to:

(i) strictly follow the Rules/Procedures laid down by the Department and to exercise utmost care in finalising the contracts. Various controls have also been introduced at different levels;

(ii) monitor the progress of supply against the purchase orders and assess the requirement of stores realistically; and

(iii) make quarterly inventory of items available in stores, physically verify stores, restricting indents to the items/quantity actually required and periodically review inventories to avoid unnecessary stock-piling of items.

CHAPTER II

Department of Atomic Energy

2.1 Giant Metrewave Radio Telescope (GMRT) Project

2.1.1 Introduction

In April 1984 the Tata Institute of Fundamental Research **(TIFR)** Bombay, an autonomous body which receives recurring as well as non-recurring grants from the Department of Atomic Energy **(DAE)**, proposed the setting-up of a Giant Metrewave Radio Telescope **(GMRT)** near Pune at Narayangaon. The proposal was approved in 1985. The Project was to be completed by June 1992. Accordingly, the Government of India issued a sanction for Rs 22 crores in January 1987. The cost estimates were revised twice later to Rs 35 crores in May 1990 and again to Rs 43.20 crores in August 1992.

2.1.2 Objectives

The objectives of the project are :

- to search for red-shifted cold hydrogen clouds which were believed to have existed before the formation of stars and galaxies which, if detected, would pave the way for explaining the mystery of evolution of the universe ;

- to search and study millisecond pulsars for testing the general theory of relativity ; and

- to explore radio galaxies, quasars and other objects in outer space.

2.1.3 Scope of Audit

Audit of TIFR was conducted under Section 14 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. Records relating to the GMRT Project at Pune for the period 1985-94 were reviewed in audit.

2.1.4 Highlights

- **The expenditure on the project was Rs 42.66 crores (March 1994), almost twice the estimated cost of Rs 22 crores. Increase in cost was mainly due to changes in design, delay in installation and erection of antennae and lack of an effective monitoring system. Further revision of the cost estimate to Rs 45 crores was under consideration (June 1994).**

  [Paras 2.1.6 & 2.1.8]

- **Delay in project schedule resulted in payment of extra fees of Rs 0.68 crore to the Consultant.**

  [Para 2.1.7(i)]

- **The firms responsible for supply, fabrication and erection of the antennae by June 1992, delivered only 15 antennae as against 30 till March 1994 at a cost of Rs 12.62 crores. Though 15 antennae were delivered by the firms, only four were commissioned (March 1994).**

  [Para 2.1.7(ii)]

- **Nine sets of servo system as against 30 could be delivered by BARC till April 1993 at a cost of Rs 0.16 crore. For the remaining 21 sets, BARC transferred the know-how to TIFR. Even after three**

years, the servo system had not been developed by TIFR (November 1994) resulting in delays in installation.

Non-installation of 86 out of 122 gear boxes purchased in 1992 resulted in blocking of capital of Rs 1.88 crores for the past two years without any off-setting benefit. Besides, the purpose for which these were imported was not achieved.

[Para 2.1.7(iii)]

- **Out of 65 laser diodes valued at Rs 0.19 crore imported in September 1991, 20 diodes had been installed till June 1994.**

[Para 2.1.7(iv)]

2.1.5 Project Organisation

TIFR constituted a GMRT Project Committee consisting of Chairman, Project Director and other members to review the progress of the project from time to time.

2.1.6 Project Estimates

The budget and the revised estimates for the project vis-a-vis the actual expenditure were as under :

(Rs in crores)

Item	Original sanctioned cost	Revised cost (August 1992)	Cost increase	Expenditure as of 31 March 1994
1	2	3	4	5
Antennae System	11.48	28.14	+ 16.66	29.08
Electronic System	5.32	7.77	+ 2.45	6.84
Civil Works	3.85	4.79	+ 0.94	4.29
Administration and facilities	1.35	2.50	+ 1.15	2.45
	22.00	43.20	+ 21.20	42.66

2.1.7 Implementation of the project

(i) TIFR entered into an agreement with Tata Consultancy Engineers **(TCE)** in May 1988 for design, procurement assistance, inspection, expediting construction, supervision and for overseeing the commissioning of the project. In terms of the agreement, no extra cost was payable by TIFR on account of changes in design, if required, till completion of TCE's services or 31 December 1993, whichever was earlier. The agreement, which was on man-hours basis, was extendable for a further period of two years. Design review of both structural and mechanical aspects became necessary during construction of the telescope. Due to substantial changes in the design as well as increase over the estimates in the man-hours required for inspection and supervision of the fabrication of the dishes, TCE's services had to be extended.

Consultancy charges to TCE were originally estimated at Rs 0.73 crore (May 1988). Extension of TCE's services on account of subsequent changes in design and delay in completion of project work led to upward revision of consultancy charges which amounted to Rs 1.41 crores till March 1994 and further expenditure of Rs 0.08 crore was likely to be incurred upto June 1995. Though TCE was responsible for carrying out the entire work of the project, an amount of Rs 0.06 crore was also paid to various other consultants. Thus, total expenditure of Rs 1.55 crores was likely to be incurred against the estimated cost of Rs 0.73 crore.

DAE stated (January 1995) that cost overrun of about Rs 50 lakhs on account of consultancy was due to additional design optimisation of 45 m diameter dishes and about Rs 14 lakhs could be attributed to the delay on the part of the contractors to complete the fabrication and erection work as well as greater extent of inspection and supervision required to be exercised by the consultant. It was accepted by DAE that the original estimate of man-hours was an under-estimate.

(ii) The construction of 30 parabolic dish antennae of 45 m diameter was the major component of the project. Letters of intent for fabrication and erection of the antennae were issued to two firms in December 1989 at a cost of Rs 10.97 crores. As per agreements with the firms made in August 1990 and November 1990, the delivery schedule of antennae was as under :

Number of antennae to be delivered		Date of delivery
10	antennae to be delivered by	March 1991
10	more by	October 1991, and
last 10	by	June 1992

Till 1991, there was no progress in this work. The firms did not deliver the antennae due to non-availability of

trained technical personnel and took much more time to train the skilled workers for welding elements of the antennae. This contributed to the slow progress of work. Even after incurring an expenditure of Rs 12.62 crores including payment of escalation in cost of Rs 1.65 crores, the firms had delivered only 15 antennae till March 1994 of which only four were commissioned. TIFR stated in June 1994 that the entire work would be completed by June 1995.

(iii) The Bhabha Atomic Research Centre **(BARC)**, entrusted with the development of 30 sets of servo system for antennae at a cost of Rs 2.57 crores in October 1988, delivered only nine sets till April 1993 at a cost of Rs 0.16 crore and for the remaining 21 sets of servo system, BARC transferred the know-how for the production by TIFR but the servo system has not been developed (November 1994). TIFR stated in June 1994 that the work for the development of servo system was under progress and would be completed by mid-1995.

122 gear boxes, to be installed with the antennae, were procured from a foreign firm in 1992 at a cost of Rs 2.66 crores. Only 36 gear boxes were installed till June 1994. Thus, an amount of Rs 1.88 crores paid for 86 gear boxes remained blocked for over two years without any benefit besides defeating the purpose for which these were imported.

(iv) The work of electronic system was estimated (January 1987) to cost Rs 5.32 crores including foreign exchange component of Rs 2.80 crores and was to be completed by 1992. The cost was revised to Rs 5.73 crores in May 1990 and further revised to Rs 7.77 crores in August 1992. Though TIFR had incurred an expenditure of Rs 6.84 crores (March 1994), the work had not been completed (June

1994). Delay in completion of the work resulted in cost escalation by Rs 2.45 crores on account of variations in the foreign exchange rate.

Out of 65 laser diodes valuing Rs 0.19 crore imported in September 1991 for use in the fibre optic system, 60 were to be installed with 30 antennae and 5 were to be kept as spares. However, only 20 diodes had been installed (June 1994). Thus, an amount of Rs 0.12 crore was blocked for more than three years beside the diodes kept idle due to fewer antennae commissioned. TIFR stated in June 1994 that the installation work of the remaining diodes would be completed by December 1994.

(v) An order was placed on Indian Telephone Industries **(ITI)** Bangalore in October 1990 for supply of some components to be fitted with the Surface Acoustic Wave **(SAW)** filters at a cost of Rs 7.91 lakhs. The devices were to be designed by ITI, Bangalore and released through Bharat Electronics Ltd **(BEL)**, Bangalore to GMRT. An expenditure of Rs 0.98 lakh was incurred on fabrication work of SAW filters in 130 MHz and 175 MHz bands by ITI. In August 1992, ITI expressed their inability to deliver the devices due to some technical problems. Consequently, the components had to be imported in 1993 at a cost of Rs 13.30 lakhs. Thus, failure to assess the indigenous capability to develop the component resulted in delay of over two years in its procurement as well as wasteful expenditure of Rs 0.98 lakh.

Regarding the blocking of funds on purchase of gear boxes and laser diodes, DAE stated (January 1995) that these items had to be specially designed by the manufacturers to meet the specifications of GMRT and therefore, it was cost effective to purchase the total requirement at the same time. However, speedier implementation of the project would have avoided such blocking of funds.

2.1.8 Cost and time overrun

The original financial sanction issued in January 1987 for setting up of the GMRT project was for Rs 22 crores with a foreign exchange component of Rs 3.55 crores. Due to mid-term change in design from cylindrical to parabolic antennae and slippage in the schedule, the cost estimates were revised to Rs 35 crores with foreign exchange component of Rs 5.39 crores in May 1990 and to Rs 43.20 crores with foreign exchange component of Rs 10 crores in August 1992. Another revision to Rs 45 crores was under consideration (June 1994). The total expenditure incurred was Rs 42.66 crores (March 1994) registering an increase of Rs 20.66 crores (94 percent).

The project scheduled to be completed by June 1992, has not been completed so far (November 1994) even after 29 months. Delay in completion of fabrication and erection work of antennae, substantial changes in the design and lack of monitoring system were the major factors of delay in completion of the project.

DAE stated (January 1995) that the time and cost overrun took place due to delay in the initial financial sanction of the project by Government of India by about two years, change in the basic design of the antennae, very high rate of inflation in the country during 1990-92 and an almost three-fold increase in the foreign exchange rate between 1985 and 1992. It was, however, argued by DAE that since the change of the design of the antennae from parabolic cylinders to parabolic dishes had greatly enhanced the scope and the expected scientific return from the project, the revised estimate of Rs 35 crores should be taken as the base for computing the cost overrun which, then, would work out to about 23 **per cent.**

2.1.9 Monitoring system

No detailed arrangement for monitoring the project was made beyond preparation of a time schedule chart by TIFR scientists and engineering staff. The project was approved in February 1985 and DAE issued the sanction only in January 1987. The GMRT Project Committee approved the revised cost estimates in October 1988 but DAE issued the revised sanction in May 1990. The cost was again revised in October 1991 but DAE issued a sanction for Rs 43.20 crores in August 1992. Neither had any internal committee been set up nor any review committee formed by DAE to look into the progress of the project from financial and technical points of view. Thus, lack of proper monitoring system was also a major factor contributing to the delay in completion of the project which needs improvement.

2.1.10 Conclusion

Only a small fraction of the antennae and ancillary equipment like servo system, gear boxes, laser diodes procured had been installed. As against the target of installation of 30 antennae by June 1992, 15 antennae were erected by February 1994 of which four antennae were working as on 31 March 1994. In the light of the performance of the four antennae that had become operational, Department expected that the objectives of the project were likely to be achieved over the next few years with all the antennae in full operation.

CHAPTER III

Department of Biotechnology

3.1 Audit review of the Department

3.1.1 Introduction

In February 1982, the National Biotechnology Board **(NBTB)** was set up under the Department of Science and Technology **(DST)** for integrated development of the discipline of Biotechnology. The Department of Biotechnology **(DBT)** was constituted in February 1986 as successor to NBTB.

3.1.2 Scope of Audit

This review covers the activities of the Department as observed during a test check of its various transactions pertaining to the period from 1988-1994.

3.1.3 Organisational set up

Department of Biotechnology (DBT) is headed by the Secretary.

Two Committees, the Scientific Advisory Committee and the Standing Advisory Committee advise the Department on policy issues and framing of programmes, the latter being concerned with projects involving overseas collaboration. Besides, a number of task forces comprising eminent scientists have been formed to identify thrust areas and programmes of high priority as well as to review the progress of research projects.

As on 31 March 1994, DBT had 73 scientific /technical personnel and 154 administrative staff against the sanctioned strength of 83 and 166 respectively.

3.1.4 Highlights

Test check of 58 out of 470 approved projects revealed:

- 19 projects had not been peer reviewed before approval. 4 projects were prematurely terminated after incurring an expenditure of Rs 1.17 crores. Out of 23 projects due for completion during 1988-94, only 12 were completed.

  Out of Rs 2.06 crores released as grant to IDPL up to March 1991 for the Antibiotic Development Consortium, Rs 1.37 crores was lying unutilised with the company. The benefit to accrue to HAL from the Consortium was initially estimated at Rs 95.96 crores but the company intimated the actual benefit as only Rs 2.49 crores up to 1992-93. The question of payment of royalty to DBT and the utilisation of the assets acquired by the company with DBT's assistance remained unresolved.

  A project at TERI, due to be completed by 1993-94 was extended up to 1997 and its cost was revised from Rs 4.65 crores to Rs 12.40 crores, with DBT's share rising from Rs 2.60 crores to Rs 9.15 crores.

  [Para 3.1.7]

- Up to 1993-94, only one technology, developed from DBT assisted projects, had been patented.

  [Para 3.1.8]

- The construction of a building for the National Facility for Animal Tissue and Cell Culture at Pune had been going on since February 1986. The latest cost estimate was Rs 14.33 crores as against the original estimated cost of Rs 1.25 crores.

  [Para 3.1.9]

- **The computerised project monitoring system introduced in 1988 had not been properly utilised.**

[Para 3.1.10]

- **No policy or procedure had been decided regarding the final disposition of assets acquired by grantee institutions out of project grants.**

[Para 3.1.11]

3.1.5 Objectives

The Department of Biotechnology has been set up to plan, promote, import, coordinate and monitor programmes in Biotechnology including Genetic Engineering and other cell-based R&D.

3.1.6 Budget and expenditure

The budget provision vis-a-vis expenditure of DBT for the period 1988-94 was as under:

(Rs in crores)

Year	Budget Provision		Expenditure		Savings	
	Plan	Non-plan	Plan	Non-plan	Plan	Non-plan
88-89	40.00	1.55	39.99	1.51	0.01	0.04
89-90	52.25	1.60	52.25	1.58	-	0.02
90-91	56.74	2.91	56.58	2.77	0.16	0.14
91-92	63.90	2.76	61.34	2.69	2.56	0.07
92-93	75.00	2.97	73.17	2.96	1.83	0.01
93-94	85.00	3.10	78.00	3.01	7.00	0.09

3.1.7 Projects and schemes

DBT released Rs 309.50 crores as grants-in-aid to various autonomous bodies and Universities for implementation of biotechnological programmes during the years 1988-94. Out of 1553 projects received, 470 were approved at a cost of Rs 169.32 crores.

Out of 470 approved projects, 99 projects at a cost of Rs 11 crores were completed (March 1994) and extensions had been allowed for 82 projects which were due for completion before March 1994.

During audit, 58 projects were reviewed. Out of these projects, twelve were completed before March 1994 and six were prematurely terminated. The remaining 40 projects were continuing in 1994-95.

Projects not peer reviewed by external experts

As per guidelines issued by Ministry of Science and Technology, research project proposals are required to be peer reviewed by external experts. It was, however, noticed in audit that 19 project proposals were approved by DBT without getting peer reviewed.

Terminated projects

Six projects were closed or terminated by the Department. In one case, the project was not executed by the Principal Investigator (PI) showing his inability to initiate the work; in one case, the PI, after initiation of the project, did not accept the project concept; in two cases, the projects were terminated due to unsatisfactory progress; and in two cases, the PIs left the concerned Institutes before completion of the projects. Thus, an expenditure of Rs 1.17 crores incurred on four of these six projects remained unfruitful. There was no expenditure on the other two terminated projects.

The project titled "Introduction of Bacillus thuringiensis protein gene into pigeonpea and chickpea" was approved in March 1990 at a cost of Rs 33.23 lakhs with a duration of five years for execution in a private institution.

The PI came up with various difficulties (like non-availability of facilities, constraint of space etc) in the execution of the project and eventually (May 1993) indicated that the objectives of the project had turned out to be extremely difficult, warranting change in orientation and allocation. In October 1993 the PI left the Institute and did not submit the final report.

In January 1994 DBT had to abandon the project without getting full results after incurring an expenditure of Rs 21.37 lakhs.

DBT stated in December 1994 that major equipments procured for the project had been transferred to the Institution which PI had joined and the unaccomplished objectives of the project had been assigned to the same PI at his current Institution in the form of a newly sanctioned project.

Completed projects

Out of 58 projects reviewed in audit, twenty three projects were due for completion during the period 1988-94 but Department granted extension upto less than one year in nine projects and one year and above in eight projects. In all, twelve projects were completed upto March 1994 of which the final progress report was not received (September 1994) in DBT in respect of five projects; delay upto six months was found in two projects out of the seven for which final reports had been received. Results were achieved in three cases.

On-going projects:

Antibiotic Consortium

In August 1988 DBT constituted the Antibiotic Development Consortium to evolve a total technology package and

explore possibilities for procurement of highly productive microbial strains from reputed foreign R&D units for Rifampicin, Aurofungin, Penicillin, etc. Institute of Microbial Technology, Chandigarh **(IMTECH)**, Biochemical Engineering Research Centre at Indian Institute of Technology, New Delhi **(BERC-IIT)**, Indian Drugs and Pharmaceuticals Ltd, Gurgaon **(IDPL)** and Hindustan Antibiotics Ltd, Pune **(HAL)** were identified as members of the proposed Consortium. IMTECH was to undertake R&D for strain improvement through mutation and genetic engineering whereas BERC-IIT was to do R&D in fermentation technology and downstream processing. IDPL and HAL were identified for process optimisation, raw material standardisation and upscaling of plant level trials. After the initial stage of deliberations regarding modalities for functioning of the Consortium, there was no further involvement of IMTECH and BERC-IIT in the Consortium. After examination of the project proposals, IDPL and HAL were each sanctioned grants of Rs 2.70 crores In case of HAL, the amount of assistance was enhanced to Rs 3.46 crores in March 1991.

Rs 2.06 crores were released to IDPL in two instalments in March 1990 and March 1991. As at the end of 1993-94, unutilised amount of Rs 1.37 crores was lying with IDPL which is recoverable by DBT with interest. During audit, DBT could not produce any account rendered by IDPL regarding utilisation of the grant.

At HAL, required equipments were purchased and research activity started. At the stage of approval of the project, the monetary benefit accruing to the company had been estimated at Rs 95.96 crores but the company in 1992, revised the estimate of the monetary benefit upto 1994-95 to Rs 42.47 crores. In 1993, the company revised the estimate of monetary benefit further downwards to Rs 35.12 crores upto 1999. Finally, in December 1993, it was

intimated by the company that the actual benefit for three years upto 1993 was Rs 2.49 crores only. When DBT raised the question of payment of royalty, HAL pleaded that as there were no sales directly attributable to the project, no royalty was due to DBT. This issue remained unresolved.

During audit scrutiny of the project records, the following points were noticed:

(1) The Consortium was proposed to be implemented as a single multi-centric R&D project with each of its members being assigned specific R&D activity. But at the time of project appraisal, total cost involved in implementation of the composite project and the respective shares of each of the participating members were not clearly determined. The sanctions were given treating each component of the Consortium as an independent project. As a result, the requirement regarding referring the proposal to Expenditure Finance Committee (EFC) prior to sanction was not followed.

(2) While sanctioning Rs 2.70 crores (of which Rs 2.60 crores was earmarked for equipment) to HAL in March 1990, it was stipulated that any excess expenditure on procurement of equipment would be borne by HAL. However, in March 1991 at the request of HAL, an additional amount of Rs 0.76 crore was sanctioned for purchase of equipment.

(3) As per MOU signed between HAL and DBT, the assets acquired out of grant under the project were to remain the sole property of DBT and the right to transfer the assets was vested in DBT. On the basis of a news item of June 1994 that the Penicillin-G facility created under the overall project was intended to be leased out by HAL to a joint venture between HAL and a foreign firm, the

matter was taken up by DBT with the Ministry of Chemicals and Fertilisers which is the administrative Ministry of HAL. Further developments in the matter were not known (December 1994).

Establishment of Tissue Culture Pilot Plant Facility

DBT sanctioned a project on "Establishment of Tissue Culture Pilot Plant Facility" at Tata Energy Research Institute **(TERI)**, near Delhi in February 1989 at a cost of Rs 4.65 crores (DBT's share Rs 2.60 crores and TERI's contribution Rs 2.05 crores) with a view to establishing a pilot plant for production of biomass, fuel, fodder, timber and wood. Project duration was five years (1989-94). The cost of the project was revised to Rs 12.40 crores in April 1993 (share of DBT and TERI being Rs 9.15 crores and Rs 3.25 crores respectively) and duration was extended upto 1997.

(i) DBT had made the availability of uninterrupted supply of water and electricity a pre-condition for the selection of the centre at Gual Pahari(Haryana). However, due to local power supply being erratic an application for a separate feeder line was made by TERI which was not allowed by the Haryana State Electricity Board(HSEB). Work had been going on with generator based power.

(ii) The ratio of relative contribution of TERI and DBT was changed from 56:44 to 73:27 on the ground that the value of the land owned by TERI had not been included in the first project proposal. It was, however, seen from the records that the cost of land had initially been taken into account for calculating TERI's share of the project.

(iii) Under the project, TERI constructed a larger building (2382 sq m instead of 974 sq m) without DBT's approval. The site-visiting committee constituted by DBT

in August 1990 did not recommend revision of the project cost and TERI had given an undertaking at the time of the revision of the project cost to Rs 5.38 crores in November 1990 to bear any expenditure in excess of the revised project cost. Despite all these, DBT revised the project cost in stages to Rs 12.40 crores from the original cost of Rs 4.65 crores.

(iv) From the fifth year of the project, the salary of staff and the running expenditure were to be borne by TERI according to the MOU but at the time of the third revision of the project cost to Rs 12.40 crores (March 1993), this condition was deleted and DBT agreed to meet the expenditure for the entire period of eight years.

The Department stated (November 1994) that since TERI, a non-profit organisation, had increased its contribution at the time of EFC approval it was decided that DBT would defray the salary expenditure for eight years. Additional grant for building was provided after justification of additional space requirement.

Improving tea productivity and quality

A project on "Improving Tea Productivity and Quality through the techniques of Biotechnology" was approved in March 1990 at a cost of Rs 30.75 lakhs with a duration of five years.

The project was approved despite unfavourable comments of experts, suggestions for clubbing this project with an earlier approved major project on tea and the fact that the Principal Investigator would not be available for the entire duration of the project.

Implementation of the project did not progress as planned on account of delay in procurement of equipment. Due to this, the Department paid Rs 14.54 lakhs towards cost

escalation which represented approximately fifty **per cent** of the total project cost. The utilisation of chemicals/glassware during initial three years worked out to thirty **per cent** of the provisions for these years under the head, underscoring the slow progress of the project.

3.1.8 Technology development

Department of Biotechnology (DBT) had been designated the screening, advising and approving agent of Government for technology development and transfer to the industry for the manufacture of biological and biotechnological products and their intermediates. Up to 1993-94, as many as 99 projects funded by DBT costing Rs 11 crores had been completed but no new technique had been standardised and patented by the Department under these projects except one on "Bamboo Tissue Culture technology" in 1994-95 which was transferred to Tata Energy Research Institute, Delhi. Fifteen other technologies had been transferred by DBT to industries up to 1993-94. But these had been developed without utilising any funds from DBT; the Department had only identified the Institutes and the technologies and helped in transferring the technologies to the industry.

3.1.9 National Facility for Animal Tissue and Cell Culture, Pune (NFATCC)

NFATCC was set up in February 1986 with the estimated total cost of Rs 3.78 crores including Rs 1.25 crores for a building. Slow progress in utilisation of funds was reported in para 4.2.15 of CAG's report no. 2 of 1992. Mention was also made in para 15 of CAG's report no. 7 of 1989 on the delay in construction of the building.

By March 1988, the University's approval for MOU and allotment of a site as well as necessary clearance from

Pune Municipal Corporation for construction had been received. After discussion with the engineers of DBT, the Department of Atomic Energy **(DAE)**, CPWD and the Surveyor of the University, NFATCC approached DBT in September 1988 for approval to entrust the construction work of the Facility's office-cum-laboratory complex to DAE (Construction & Services Group). Approval was received in January 1989. By September 1990, the cost estimate was enhanced to Rs 6.38 crores from Rs 1.25 crores. According to the schedule for completion of the complex, this work was to be completed by March 1993. But the area to be constructed was decided only in January 1992 when the building area was restricted to 56800 sq.ft. against 85300 sq.ft. planned earlier.

Due to this delay and frequent changes in the plans, NFATCC could not complete the required formalities like appointment of architect, preparation of sketch designs and approval of plans by concerned authorities. In the EFC memo submitted in September 1992, the estimate for construction of the building had been further revised from Rs 6.38 crores to Rs 14.33 crores due to cost escalation. A part of the increased cost amounting to Rs 1.15 crores, arose due to the purchase of two buildings by NFATCC in 1989 and 1990 pending construction of the projected building complex. Purchase of the buildings was not envisaged in the project originally; with the approval of the Governing Body, the purchase was made by NFATCC out of the funds released by DBT for construction work without the latter's prior approval. The construction of building complex commenced in August 1992 and was scheduled to be completed by February 1995.

3.1.10 Monitoring and evaluation

Use of Project Evaluation and Review Technique **(PERT)** in the project formulation in all scientific

institutions/laboratories was emphasised by Ministry Of Science and Technology. All such organisations were required to prepare detailed progress reports for each project giving the full description of time schedule, objectives, physical and financial milestones, computation of manpower, cost and mode of funding. Progress reports had not been prepared by DBT. Instead, with the approval of the Secretary, one top-sheet format incorporating this type of information was prepared for being kept with individual project files. However, the top-sheets had not been updated and completed periodically for making any meaningful appraisal or monitoring of the project possible.

Actual monitoring of projects was done on the basis of individual project files and as and when it was felt necessary, site visits by DBT officials and external experts were undertaken but after such visits, no separate report or statement showing physical and financial milestones achieved in the project was prepared and brought on record. A note alone was usually recorded on the project file indicating that the progress was satisfactory. In May 1993, Department had prepared a detailed procedure for project monitoring and review and got it approved by the Scientific Advisory Committee but it was not circulated to or implemented in each division.

DBT had developed a computerised project monitoring system in 1988 with the help of National Informatics Centre **(NIC)** for the purpose of monitoring, coordination and record keeping of individual projects. Though data entry work started in early 1989, the data had not been updated periodically resulting in non-availability of reliable data for the purpose of project monitoring and funding analysis at various stages.

While accepting the facts DBT stated in November 1994 that the data base was partially updated and added that efforts were being made to improve it.

3.1.11 Other points

(i) Since February 1986 the Department has been operating one post of Advisor in the scale of Rs 7300-7600 and two in the scale of Rs 5900-7300 against three available posts in the scale of Rs 5900-7300. There was no order for creation of the post in the higher scale of Rs 7300-7600. The matter was referred (July 1994) to higher authorities at the instance of audit.

In June 1994 the Department stated that two posts of Advisor had been surrendered in 1994-95. As DBT was having two Advisors in position including one in the scale of Rs 7300-7600 as mentioned above one excess post was being operated without sanction since March 1994.

(ii) As per Recruitment Rules of the Department a minimum of five years service in the lower grade is required to fill up a post of Director through deputation. The Department filled up the post of Director (Animal Biotechnology) in April 1992 by a candidate who had two years and eight months of service in the lower grade as on the date of appointment.

Department stated (November 1994) that the Officer concerned had completed five years of service in the lower grade on 6th September 1991. It was, however, seen from the records that ICAR had issued orders in April 1990, promoting the officer to the lower grade with effect from 31 July 1989 and the officer did not have five years of service in that grade even at the time of taking up his post in DBT.

(iii) Irregular expenditure

Out of 58 projects reviewed in audit, in two cases, approval of EFC was obtained after 24 months from the date of first release of funds. Out of 26 cases involving expenditure between Rs 50 lakhs and Rs 5 crores, which require the approval of Standing Finance Committee (SFC), such approval was not obtained in six cases involving Rs 10.36 crores; in two cases involving Rs 3.31 crores, SFC approval was obtained after 21 months from the date of first release of funds.

(iv) Additional funds released without approval of Secretary

In nine projects with sanctioned cost of Rs 2.27 crores, funds in excess of the sanctioned cost amounting to Rs 59.92 lakhs were released because of cost escalation, without obtaining the approval of the Secretary who had sanctioned the projects originally.

The Department stated (November 1994) that approval of the competent authority had since been obtained.

(v) Issue of sanction before approval

In three cases (one each in 1988-89, 1989-90 and 1990-91) with sanctioned cost of Rs 58.85 lakhs, DBT issued the formal sanction orders and also released Rs 32.67 lakhs before the projects were actually sanctioned by the competent authority.

The Department stated (November 1994) that approval of the competent authority had since been obtained.

(vi) Records of unspent balance and utilisation certificates

The Department released Rs 309.50 crores towards grants-in-aid between 1988-89 and 1993-94. But no records showing the upto date position of unspent balances, submission of audited statements of accounts and receipt of utilisation certificates against the grants released were available. The year-wise details of grants released were as under:

(Rs in crores)

Programme	1988-89	89-90	90-91	91-92	92-93	93-94
1. Manpower development	5.03	6.74	7.44	5.54	4.22	5.81
2. Infrastructural facility	6.23	11.33	8.48	9.61	10.19	8.15
3. Basic and Product based R&D projects	6.02	12.88	18.07	22.71	28.62	34.03
4. Demonstration/ Transfer of technology	11.83	8.29	6.22	6.60	5.26	6.20
5. International cooperation	-	0.62	0.24	0.37	0.67	0.44
6. National Institute of Immunology, Delhi	2.75	3.34	5.02	5.85	7.64	7.53
7. National Facility for Animal & Cell Culture, Pune	-	1.50	2.76	3.20	5.65	6.42
Total	31.86	44.70	48.23	53.88	62.25	68.58

(vii) Assets created in the projects

Details of assets created out of DBT's grants had not been maintained for each institute/laboratory to know the extent of these assets and the Department had not formulated any procedure and policy for the disposal of such equipments and assets after completion of the projects.

CHAPTER IV

Department of Electronics

4.1 Non-commissioning of equipment

Society for Applied Microwave Electronics Engineering and Research **(SAMEER)**, Bombay, a grantee institution of the Department of Electronics **(DOE)**, required an EPIQUIP CB 50 GSMBE Reactor(GSMBE) for the project titled "Integrated Opto Electronics Circuits (IOEC)" sponsored by DOE for development of optical devices. The project was sanctioned by DOE in December 1990 at a cost of Rs 6.93 crores for a period of five years (upto December 1995). Accordingly, SAMEER placed two purchase orders on a foreign firm in May 1991 for supply of the reactor and arsine and phosphine gases (gases required for the equipment) at a cost of Rs 1.58 crores. But the letter of credit for procurement of equipment was opened (December 1991) by Electronics Trade and Technology Development Corporation Ltd. (ET&T) due to restrictions on use of foreign exchange by SAMEER.

The main system of equipment was received at SAMEER in July 1992 and gases which arrived in India in the same month, were not cleared by the customs authorities since permission was not given by Department of Explosives as the gas cylinders were not of required specifications. Thus, the gas cylinders had to be returned to Sweden. The gases (in safety containers) were yet to be received (July 1994). SAMEER paid Rs 2.58 crores as against total claim of Rs 2.69 crores by ET&T for the equipment. The balance was yet to be paid (July 1994).

On opening the consignment in August 1992, it was noticed that the equipment was in damaged condition for which

ET&T filed a claim with the insurance company which was yet to be settled.

Thus, equipment received in July 1992 was not commissioned for want of gases resulting in blocking of Government funds of Rs 2.58 crores for over two years besides defeating the purpose for which it was required.

While accepting the facts, DOE stated in December 1994 that the insurance company had in principle agreed to pay damages.

CHAPTER V

Ministry of Environment and Forests

5.1 Ganga Action Plan

5.1.1 Introduction

An Action Plan for prevention of pollution of the river Ganga was prepared by the Department of Environment in December 1984. The main sources of pollution of the Ganga were :

(i) Urban and industrial waste from the towns situated on the banks of the river including the tributaries;

(ii) large scale bathing of cattle;

(iii) corpses discarded in the river;

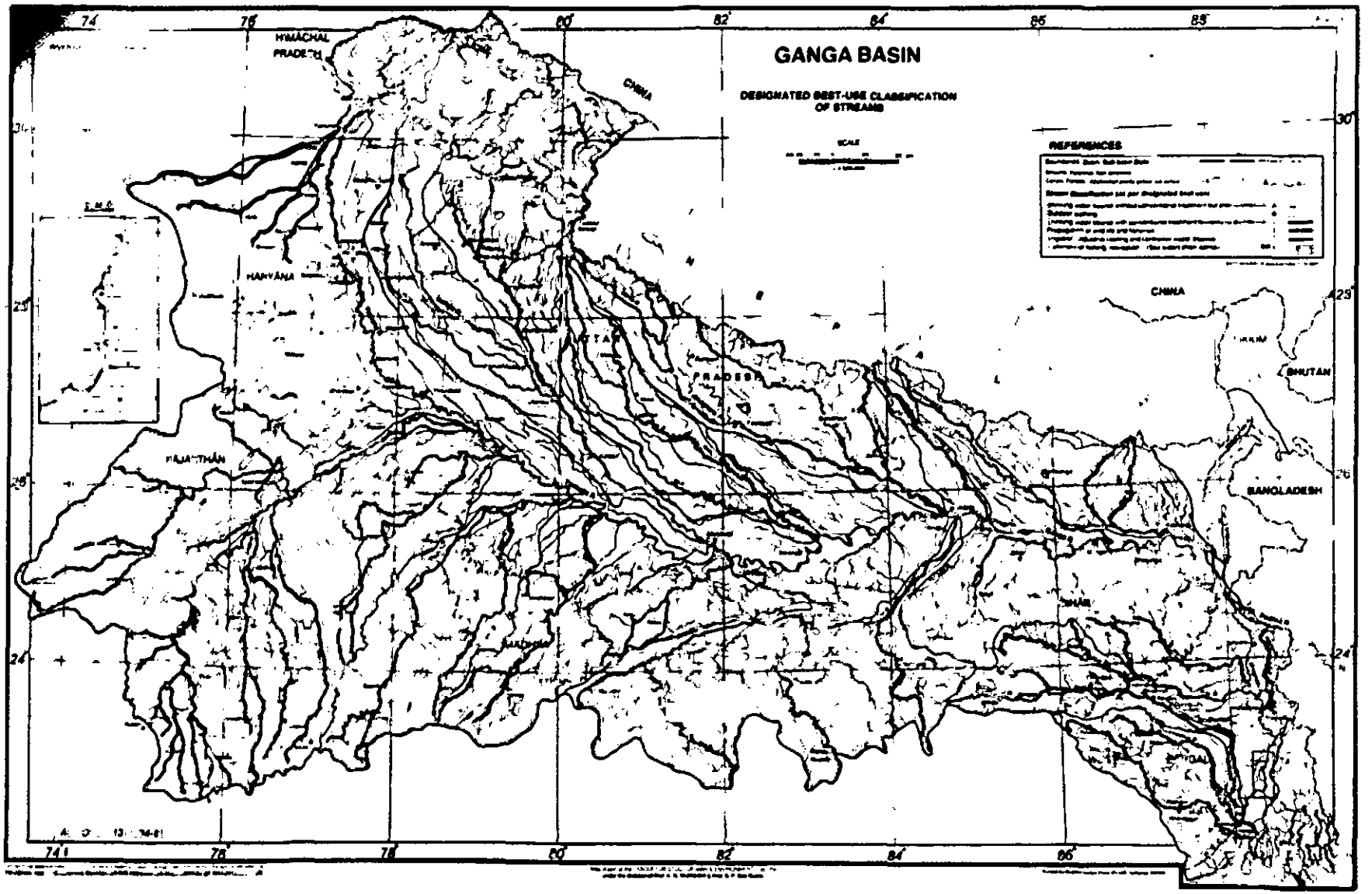
(iv) surface run-off of pesticides and insecticides from agricultural fields.

Phase-I of Ganga Action Plan **(GAP)** was approved by Government in April 1985. It was still continuing, expenditure of Rs 371.13 crores having been incurred till March 1994.

Yamuna Action Plan and Gomati Action Plan under GAP phase-II were approved by Government in April 1993 at an estimated cost of Rs 421 crores for six years. An amount of Rs 17.89 crores was released to the concerned State Governments under GAP phase-II up to March 1994..

5.1.2 Objectives

The main objectives of GAP were immediate reduction of pollution load on the river and establishment of self-sustaining sewage treatment plant **(STP)** systems. To


GANGA BASIN
DESIGNATED BEST-USE CLASSIFICATION OF STREAMS
SCALE
REFERENCES
HIMACHAL PRADESH
HARYANA
RAJASTHAN
CHINA
NEPAL
BHUTAN
BANGLADESH
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achieve the main objectives of GAP, the following components were identified:

(a) Construction of interceptors, pumping stations and sewage treatment plants as well as renovation of the existing system to ensure the flow of only treated sewage into Ganga;

(b) To derive revenue to cover operation and maintenance **(O&M)** cost of these plants;

(c) Construction of community as well as individual toilets and electric crematoria **(EC)**; and

(d) Additional activities including Research and Development **(R&D)** projects, water quality monitoring projects, training of personnel and public awareness programme.

5.1.3 Scope of Audit

A mid-term audit appraisal of GAP was included in the Audit Report for the year ended 31 March 1989. The present review covers the implementation of schemes of Ganga Action Plan phase-I and an appraisal of its achievements at selected cities of Uttar Pradesh **(UP)**, Bihar and West Bengal**(WB)**. The records for the period 1989-94 were checked at various offices of the implementing agencies and at GPD, New Delhi.

5.1.4 Organisational set up

To oversee the implementation of the Ganga Action Plan, the Central Ganga Authority **(CGA)** was constituted in February 1985. CGA lays down policies and programmes to be taken up under GAP. A Steering Committee under the chairmanship of the Secretary, Department of Environment oversees the implementation of GAP schemes as approved by CGA. A Monitoring Committee **(MC)** under the

chairmanship of Member (Environment), Planning Commission was set up to monitor and review the technical aspects of GAP. The Monitoring Committee was to meet quarterly but no meetings were held between July 1990 and September 1992 owing to frequent changes in the composition of the Planning Commission. A Research Committee **(RC)** was also set up for selection of thrust areas in research, appraisal and monitoring of the R&D projects.

The Ganga Project Directorate **(GPD)** was set up in the Department of Environment to implement the projects under the guidance and supervision of CGA and the Steering Committee. GPD has regional offices at Allahabad and Calcutta, headed by Regional Directors to liaise with State Government agencies regarding preparation and execution of schemes.

Individual schemes under GAP are implemented by the concerned State Governments through their implementing agencies namely Uttar Pradesh Jal Nigam **(UPJN)** in UP, Bihar Rajya Jal Parshad **(BRJP)** in Bihar and Calcutta Metropolitan Development Authority **(CMDA)** in West Bengal.

5.1.5 Highlights

- **The original cost of Rs 272 crores was revised to Rs 468 crores for completion of 261 schemes. Rs 371.13 crores was spent upto March 1994 and 31 schemes remained incomplete. The cost escalation was attributed to delay in completion of the schemes because of non-availability of land in time, dispute with contractors and change in design and scope of the works.**

[Para 5.1.6 & 5.1.7]

- There was no effective mechanism with GPD to detect unauthorised use of funds by the State implementing agencies. Expenditure of Rs 9.04 crores was incurred by the implementing agencies for purposes not approved by GPD. Governments of UP and Bihar diverted GAP funds amounting to Rs 7.25 crores for meeting their share of expenditure on operation and maintenance of MPSs and STPs.

[Para 5.1.6]

- Against the target of 664 million litres of sewage per day to be intercepted and treated under GAP phase-I in Kanpur, Allahabad, Varanasi, Patna and Calcutta(including Howrah), an average of only 396 million litres per day (Mld) was intercepted during October 1993 to March 1994. The average quantity of sewage treated during the same period was only 182 Mld.

[Para 5.1.8 & 5.1.10]

- Two STPs in Kanpur, One in Allahabad, three in Patna and four in Calcutta and Howrah were incomplete as on 31 March 1994. In one STP scheme in Calcutta, extra liability of Rs 1.57 crores had to be incurred because of delay in acceptance of tenders. In another scheme in West Bengal, extra expenditure of Rs 28.61 lakhs was incurred because of procedural delay in obtaining sanction from GPD. In one scheme in UP, delay on the part of the contractor to procure a dual fuel generating set led to extra liability of Rs 42.15 lakhs.

GAP envisaged that STPs would function as resource recycling units producing energy, fish, manure etc; GPD had estimated the annual cost of operation and maintenance (O&M) of STPs at Rs 13.5 crores per year

of which Rs 6.2 crores was expected to be set off from recovery of resources. Test check in audit indicated that the likelihood of recovery of the anticipated revenue was remote. The actual amount of revenue realised could not be ascertained.

[Para 5.1.10]

- **The data collected by GPD for monitoring the quality of water was at variance with the results of CPCB mainly due to the fact that uniform practices were not followed for collection of data. While dissolved oxygen (DO) and biochemical oxygen demand (BOD) were within the permissible limits except at Kanpur, bacterial load (coliform count) was much in excess of the prescribed standards at all sampling points. The schemes under GAP did not provide for control of bacterial load.**

[Para 5.1.11]

- **Against the budget allocation of Rs 1.44 crores for publicity during 1989-94, expenditure was only Rs 0.50 crore, pointing to the lack of progress in promoting public awareness.**

[Para 5.1.16]

5.1.6 Financial management

In April 1985, GAP phase-I was approved by Government with an estimated outlay of Rs 250 crores for the Seventh Plan period. 261 schemes were sanctioned with the total estimated cost of Rs 272 crores. The sanctioned cost was revised to Rs 468.04 crores which was approved by Government in August 1994. The revision of cost was attributed to escalation due to delay in completion of schemes and to changes in design, physical conditions and unforeseen additional items.

The number of the schemes sanctioned for each State and their cost are shown below:

(Rs in crores)

State	No. of Towns/ Cities	No. of schemes	Original sanctioned cost	Revised cost	Cost escalation
(1)	(2)	(3)	(4)	(5)	(6)
UP	6	106	116.72	184.84	68.12
Bihar	4	45	33.59	53.29	19.70
West Bengal	15	110	121.67	187.86	66.19
Total	25	261	271.98	425.99	154.01
i) Estimated expenditure towards GPD's share on O&M				25.30	
ii)Estimated expenditure on R&D, Non-Government Orgnisations(NGOs), GPD establishment etc.				16.75	
Total revised cost				468.04	

The amount of grant actually released by the Central Government to the States till 1993-94 was Rs 379.70 crores out of which Rs 356.52 crores was utilised till March 1994. The total expenditure in GAP phase-I, including direct expenditure incurred by Government of India, amounted to Rs 371.13 crores.

Irregular expenditure

(i) The implementing agencies in Uttar Pradesh, Bihar and West Bengal did not furnish the audited accounts and statement of assets nor did GPD initiate any action to obtain these. GPD received only the utilisation certificates and figures of month-wise consolidated expenditure on individual schemes from the State implementing agencies. In the absence of the details of head-wise expenditure on individual schemes, GPD was not in a position to check if expenditure was being incurred only on items of work sanctioned by GPD. Test check of the initial records of the implementing agencies revealed

that expenditure of Rs 9.04 crores was incurred on various items not sanctioned by GPD. Details are given below:

State		Item of expenditure	(Rs in crores) Amount involved
U P	i)	Payment towards supervision charges by UPJN, Mirzapur.	1.05
	ii)	Construction of staff quarters at Varanasi	0.06
	iii)	Construction of guest house/office at Hardwar	0.05
Bihar	i)	Establishment expenses of division and circles	4.62
	ii)	O & M of Low Cost Sanitation **(LCS)**, Electric Crematoria **(EC)** and vehicles	2.57
	iii)	Construction of Jal Bhawan, godown and purchase of vehicles by BRJP.	0.18
	iv)	Expenditure on exhibition and jhanki beyond sanctioned amounts	0.15
	v)	Claim of excess amount against actual expenditure	0.11
West Bengal	i)	Salary of Staff of Berhampur Municipality.	0.15
	ii)	Purchase of material not utilised for GAP Schemes by Calcutta Metropolitan Water and Sanitation Authority (CMWSA)	0.10
		Total	9.04

GPD stated (December 1994) that the matter would be taken up with the State Governments.

(ii) Upto September 1989, the expenditure on O&M of Main Pumping Station **(MPS)** and STPs was borne by GPD but from October 1989, the expenditure was to be shared equally

between GPD and the State Governments. It was seen during audit that in UP, as in April 1994, Rs 3.94 crores of GAP funds had been utilised to meet the expenditure on O&M of assets which ought to have been met from State Government resources. Similar diversion of Rs 3.31 crores was made in Bihar as in March 1994. In order to check diversion of funds, the Steering Committee felt the need to verify the accounts rendered by the implementing agencies by concurrent inspection of accounts in all the three States and decided (June 1992) to stop further release of funds unless the State Governments recouped the GAP funds diverted by the implementing agencies. GPD stated (December 1994)that the inspection of accounts in the three States was undertaken between January and March 1993 and several cases of diversion of funds were detected. Release of grants was, however, not stopped in any case.

Non-accounting of funds

In Bihar an amount of Rs 17.29 lakhs on account of interest earned during 1985-94 on fixed deposits and savings accounts of GAP funds was not credited to GAP fund and the matter was not reported to GPD.

Similarly in UP, interest of Rs 34.24 lakhs earned upto March 1994 on savings accounts and term deposits of GAP funds was neither refunded to GPD nor adjusted from their subsequent grants.

5.1.7 Schemes under GAP

The physical progress of various schemes under GAP phase-I, as on 31 March 1994 was as under:

S.No	Schemes	Total schemes sanctioned	Uttar Pradesh			Bihar			West Bengal		
			Total sanctioned	Completed	On-going	Total sanctioned	Completed	On-going	Total sanctioned	Completed	On-going
(i)	Interception and Diversion (ID)	88	40	39	1	17	17	-	31	22	9
(ii)	Sewage Treatment Plants (STP) including MPS	35	13	7	6	7	1	6	15	10	5
(iii)	Low Cost Sanitation (LCS)	43	14	13	1	7	7	-	22	22	-
(iv)	Electric Crematoria (EC)	28	3	3	-	8	8	-	17	15	2
(v)	River Front Development (RFD)	35	8	8	-	3	3	-	24	24	-
(vi)	Other Schemes	32	28	27	1	3	3	-	1	1	-

In case of the 31 on-going schemes, work was less than 50 **per cent** complete in five cases, of which two were in West Bengal, two in Bihar and one in UP. The on-going schemes were likely to be completed by March 1996.

The extent of delay, as on 31 March 1994, in respect of the on-going schemes with reference to the target dates initially fixed by GPD is shown in the following table:

Type of scheme	No. of schemes	Delay
I D	10	8 to 76 months
STP	17	3 to 82 months
EC	2	48 to 51 months
LCS	1	27 months
Other schemes	1	39 months

Out of the above schemes, as many as 25 were delayed by more than 3 years.

The major reasons for delay were non-availability of land in time and disputes between the implementing agencies and the contractors.

5.1.8 Interception and Diversion(ID) schemes

The progress and performance of interception and diversion schemes at five selected cities as on 31 March 1994 are depicted in the following table :

	Number		quantity in million litres per day (Mld) Capacity	Capacity	Sewage
Name of city	targeted	completed	targeted	commiss-ioned	actually diverted*
Kanpur	7	7	160	160	128.62
Allahabad	10	10	90	90	75.24
Varanasi	11	10	125	125	133.62 #
Patna	14	14	109	30	33.86 #
Calcutta & Howrah	9	4	180	45	25
Total	51	45	664	450	396.34

Quantity increased due to greater flow of sewage

* Average for six months from October 1993 to March 1994

The single incomplete ID scheme at Varanasi was expected to be completed very shortly. In Calcutta and Howrah, the reasons for 5 schemes remaining incomplete were encroachment on land, resistance by public, court injunctions as well as increase in the scope of work and change in design.

An instance of avoidable/inadmissible expenditure noticed in the execution of ID schemes is given below:

The work of construction of three pumping stations at Cossipore-Chitpore (Calcutta) was awarded in December 1988 for Rs 1.38 crores. The work at two stations could not commence due to non-availability of land and interim orders of injunction issued by the High Court of Calcutta. The work relating to the third station commenced in May 1989 and was suspended by the contractor in June 1992, after execution of work valued at Rs 0.38 crore. Between November 1989 and November 1990, the

contractor also delivered mechanical and electrical equipment for the first two stations as per provisions in the tender. The land for the first two stations was subsequently made available to the contractor in May 1993 and August 1993. Meanwhile, since the request of the contractor for enhancement of the contract value had not been accepted, the contractor moved the High Court claiming Rs 1.27 crores on account of establishment charges, overheads, interest charges etc. Thus the scheme sanctioned in November 1987 remained incomplete; escalation of Rs 0.38 crore over the original sanctioned estimate of Rs 1.38 crores had already been allowed by GPD while sanctioning the revised estimate of Rs 1.76 crores. There would be further escalation as and when the work is taken up again for completion. Thus award of work without ascertaining the availability of land resulted in cost escalation and avoidable liability on GPD.

5.1.9 Main Pumping Stations (MPS)

(i) The progress and performance of Main Pumping Stations at five selected cities as on 31 March 1994 are shown in the following table:

(quantity in million litres per day)

Name of City	Number		Quantity of sewage received at MPS	Quantity* of sewage actually pumped	
	Targeted	Completed		to STP	to sewage farm
Kanpur	1	1	128.62	5.00	123.62
Allahabad	1	1	75.24	-	75.24
Varanasi	4	4	133.62	131.30#	2.32
Patna	4	3	33.86	21.05	12.81
Calcutta & Howrah	5	1	25.00	25.00	-

STP Dinapur Varanasi receiving sewage in excess of capacity

* Average of six months from October 1993 to March 1994

The installation of one MPS at Patna and three at Calcutta and Howrah was delayed owing to difficulties of land acquisition and encroachment of sites. One MPS at Calcutta was not completed in 1993-94 as its construction was decided only in September 1993 as part of STP scheme.

(ii) The work of construction of MPS at South Suburban (West) in Calcutta was awarded to a contractor in March 1991 for Rs 1.25 crores with the stipulation to complete the work by November 1992. The contractor, however, could not commence the work till December 1993 as the earmarked land was under encroachment. The encroachment was removed only in January 1994 and the implementing agency agreed in March 1994 to pay the contractor the claim of Rs 7 lakhs towards escalation in cost. The extra liability was incurred as the encroachment could not be cleared in time.

(iii) For supply of 6 KV power for the main pumping station at Garden Reach, Calcutta Electric Supply Corporation **(CESC)** claimed (March 1991) Rs 26.08 lakhs as connection charges. Part payment of Rs 3.05 lakhs was made in March 1991. The sanction of GPD was obtained for payment of the balance of Rs 23.03 lakhs in June 1992 but CESC revised their pending claim to Rs 28.06 lakhs in July 1992. Pending settlement of the claim, CESC had not started the work. Sanction for the payment of Rs 28.06 lakhs was accorded by GPD in August 1993 but before the payment was made, CESC had revised their claim further to Rs 32.02 lakhs. The payment had been made in February 1994. As a result of the delay in sanctioning the payment at various stages, additional expenditure of Rs 8.99 lakhs had been incurred. While accepting the facts, GPD stated (December 1994) that the question of frequent revision of power connection charges by CESC had been taken up with the State Government.

5.1.10 Sewage Treatment Plants(STP)

(i) The progress and performance of Sewage Treatment Plants as on 31 March 1994 at five selected cities are shown in the following table:

(quantity in million litres per day)

Name of city	No of STP Targeted	No of STP completed	Capacity Targeted	Capacity created	Quantity actually treated
Kanpur	3	1	160	5	5
Allahabad	1	-	90	-	-
Varanasi	3	3	125	101.08	131.30*
Patna	4	1	109	35	21.05
Calcutta & Howrah	5	1	180	45	25
Total	16	6	664	186.08	182.35

* Excess sewage being treated in STP Dinapur, Varanasi.

(ii) For the treatment of 109 Mld of sewage in Patna (Bihar), the work of construction of four STPs was taken up which involved augmentation of STPs at Saidpur and Beur and construction of two new STPs at Southern Zone and Eastern Zone. While the augmentation of STP at Beur was completed in December 1993, the work of STPs at Saidpur, Southern Zone and Eastern Zone which were scheduled for completion in December 1993, March 1990 and December 1992 respectively was in progress (March 1994). Thus, capacity for treating only 35 Mld of sewage was created against the targeted capacity of 109 Mld.

(iii) In Bhagalpur and Munger (Bihar), though the ID schemes were completed, the sewage continued to flow directly into Ganga due to non-completion of STPs to tackle 11 Mld and 13.5 Mld of sewage respectively.

(iv) GPD sanctioned, in February 1990, construction of an STP at Chapra in Bihar which included the construction of a primary treatment plant of 8 Mld capacity . Due to

frequent revisions in the designed capacity of the plant, the work of STP could not be taken up till June 1994 with the result that 8 Mld sewage intercepted in the city was flowing directly into the river.

GPD stated (December 1994) that the matter would be taken up with the State Government.

(v) Tenders for the construction of STP and MPS at Cossipore-Chitpore in Calcutta were received in July 1988 and after a lapse of two years, the lowest tender was approved in 1990 at Rs 5.29 crores. The contractor, however, expressed his inability to take up the job as the rates quoted by him in 1988 were far too low. Fresh tenders were invited in April 1991 and the lowest tender of Rs 6.86 crores including taxes, duties and spares for 3 years was accepted. Thus, owing to the delay in acceptance of the tender, extra liability of Rs 1.57 crores had to be incurred. CMDA stated (July 1994) that the time taken was reasonable since it was a very big turnkey contract which involved lot of clarifications etc.

GPD stated (December 1994) that the delay was unavoidable due to the refusal of the first contractor to accept the work; his earnest money deposit was forfeited and he was debarred from participating in the re-tender. The fact remains that due to delay in finalisation of tenders, the contractor refused to execute the work at his original rates and fresh tenders had to be invited.

(vi) While according administrative approval of Rs 7.67 crores in July 1987 for the construction of STP at Baranagar Kamarhati in West Bengal, GPD also requested CMDA to take action for calling tenders for the work. One of the works (construction of rising main of 3300 metres) involved procurement of 900 mm diameter cast iron

pipes of different types for which CMDA obtained the rates from Director General Supplies & Disposals **(DGS&D)** in 1989. CMDA, however procured the cast iron pipes during June 1990 to October 1991 at higher rates after obtaining administrative and expenditure sanction from GPD in February 1990. Due to delay in procurement of pipes, CMDA had to incur an extra expenditure of Rs 28.61 lakhs. GPD stated (December 1994) that sanctioning the expenditure was a time consuming activity and the extra expenditure was unavoidable. However, the case illustrates that Department needs to streamline its procedures.

(vii) At Bhatpara in West Bengal, the work of construction of a 10 Mld capacity low cost STP (stabilisation pond) with grit chamber was awarded to a contractor in October 1991. The work was to be completed in six months at a cost of Rs 18.13 lakhs. The construction was to take place in 18 acres of land out of which 13 acres were made available to the contractor in March 1990 but the owners of the land resisted the execution of the work as they had not been paid compensation. Compensation was paid to the affected land owners by the State Government in April 1993. The work remained suspended from February 1992 till July 1993 when the contract for the work was terminated. The remaining work, worth Rs 16.02 lakhs, as per the contract, was proposed to be carried out by another contractor at a cost of Rs 25.83 lakhs which involved extra liability of Rs 9.81 lakhs.

(viii) For the treatment of sewage at Kankhal, Hardwar (UP), UPJN entered into two contracts on turnkey basis - one in November 1988 for construction of STP and the other in January 1990 for supply, erection and commissioning of dual fuel generating **(DFG)** set. The STP was commissioned in June 1991. Supply, erection and

commissioning of the DFG set, which was to be completed by January 1991, was imported by the contractor in May 1992. As a result of delay in procurement, the Department had to bear an avoidable liability of Rs 42.15 lakhs on account of devaluation of Indian currency. Further, it could not be commissioned even by July 1994 for want of compressor.

(ix) UPJN entered into an agreement in February 1991 on turnkey basis for construction of a 130 Mld STP at Jajmau, Kanpur(UP) for Rs 18.60 crores. The work commenced in April 1991. The contractor executed work valuing Rs 5.33 crores till March 1994. Due to unsatisfactory progress of work and other difficulties with the contract, Government of UP decided to terminate the contract. The World Bank also concurred with the proposal. However, based on the representation of the contractor, Government of India appointed a committee in May 1994 to examine the merits of the case and also the possible litigation that might further delay the work. The Committee was yet to submit the report to GPD. Due to non-completion of STP at Kanpur, the water quality in terms of Biochemical Oxygen Demand **(BOD)** remained beyond the permissible level.

Similarly, the work of construction of 60 Mld STP at Allahabad (UP) awarded in August 1990 for Rs 7.99 crores, to the same contractor, was also terminated due to unsatisfactory progress after execution of work valuing Rs 3.57 crores till March 1994. The Committee appointed by Government of India in May 1994 was also examining the matter alongwith the contract of 130 Mld STP of Jajmau at Kanpur (UP).

(x) Working of sewage treatment plant as resource recycling units

GAP envisaged that STPs would function as resource recycling units producing energy, irrigant, fish and manure and earn revenue by marketing these products. In pursuance of the directions of CGA, GPD calculated the possible cost of O&M and possible revenue separately for each plant. The total O&M cost of STPs was expected to be Rs 13.5 crores per year whereas at least Rs 6.2 crores was proposed to be set off from income generated. The first three years from the date of commissioning of STP were agreed to be the watching period for monitoring the actual expenditure and revenue and the deficit was agreed to be shared equally between Government of India and the State Governments. As per figures furnished by GPD (December 1994), expenditure of Rs 30.74 crores had been incurred on O&M under GAP till February 1994 but the amount of revenue realised was not known. Thus, the actual deficit on O&M of STPs could not be ascertained. A test check in audit revealed that revenue of Rs 0.13 lakh on account of sale of sludge at STP Saidpur, Patna (Bihar) and Rs 1.36 lakhs on account of sale of treated water at STP, Varanasi (UP) were realised during 1989-94. Further, an amount of Rs 20.16 lakhs realised on account of sale of raw sewage at Kanpur during 1989-94 was not credited to GAP fund but appropriated by Kanpur Nagar Mahapalika. Judging by the meagre revenue generated in the few cases test checked in audit, the likelihood of raising Rs 6.2 crores of annual revenue appeared to be remote.

For generation of bio-gas, GPD proposed to utilise the know-how of Ministry of Non-Conventional Energy Sources **(MNES)** for which a pilot project technology was under experimentation at Bangalore. On completion of this project MNES was to submit a comprehensive proposal for

generation of bio-gas from some of the GAP schemes. However, the project was abandoned and the know-how could not be developed. No production of bio-gas/bio-energy was reported by GPD except from 5 Mld pilot plant at Kanpur (UP) and 9.8 Mld STP at Banaras Hindu University, Varanasi (UP).

The resource recovery as anticipated in the Action Plan and proposed by CGA could not take place as the generation of bio-gas was lagging behind and the State Governments could not motivate the public to lift the manure.

5.1.11 Impact of GAP schemes

(i) Water quality improvement

The principal thrust of GAP was immediate reduction of pollution load on the river. The Steering Committee in December 1986 decided to bring the quality of the water up to bathing level, the requirement for which are :

Dissolved Oxygen **(DO)**	- not less than 5 mg/l *
Biochemical Oxygen Demand **(BOD)**	- not more than 3 mg/l
Bacterial Load (coliform count)	- maximum permissible number 10000 per 100 ml

* (mg/l= milligrammes per litre)

Water quality monitoring of Ganga was carried out at 27 sampling stations by CPCB during 1986-90 with the help of State Pollution Control Boards once a month. From 1991, sampling was done thrice a month at three water widths (1/4, 1/2 and 3/4) for 15 stations by Central Water Commission **(CWC)** and for 12 stations by CPCB.

From the monitoring data compiled at GPD it was observed that BOD exceeded the prescribed level at four stations prior to 1990 but during 1993 the desired level of BOD

was achieved at all stations except at Kanpur where it was beyond the prescribed limit due to non-completion of STPs.

No clear picture regarding the impact of GAP on the DO level of Ganga emerged from the data compiled at GPD as the DO level was found to be above the bathing standard throughout the period of GAP except for one year at Kanpur.

The year-wise position of DO and BOD is given in the following tables:

DO level in mg/l

Station	1986	1989	1990	1991	1992	1993
Rishikesh	8.10	6.20	7.10	6.80	8.50	9.03
Hardwar(DS)	8.10	6.30	6.90	7.10	7.65	7.20
Garhmukteshwar	7.80	7.50	6.10	7.15	NA	8.53
Kannauj (US)	7.20	7.50	6.50	7.27	7.71	7.23
Kannauj (DS)	NA	7.50	6.10	7.07	7.10	8.43
Kanpur (US)	7.20	7.60	7.90	7.79	7.47	7.48
Kanpur (DS)	6.70	5.00	4.40	5.10	5.60	5.15
Allahabad(US)	6.40	8.90	8.00	7.08	6.81	6.88
Allahabad(DS)	6.60	7.90	6.90	6.40	7.60	7.16
Varanasi(US)	5.60	7.70	7.80	7.63	7.27	8.20
Varanasi(DS)	5.90	7.50	7.20	6.80	7.10	7.58
Patna (US)	8.60	8.00	7.70	8.06	8.06	8.15
Patna (DS)	8.10	8.10	7.50	7.40	8.00	8.04
Rajmahal	7.80	8.00	7.80	7.46	8.14	8.50
Palta (US of Calcutta)	NA	7.20	6.80	7.27	7.40	7.10
Uluberia (DS of Calcutta)	NA	6.30	6.40	5.90	6.90	6.07

N A= not available, US = upstream, DS = downstream

BOD level in mg/l

Station	1986	1989	1990	1991	1992	1993
Rishikesh	1.67	1.78	1.53	1.08	1.22	1.32
Hardwar(DS)	1.80	1.90	1.77	1.10	1.95	1.40
Garhmukteshwar	2.20	4.53	3.40	1.63	NA	1.60
Kannauj (US)	5.53	8.95	2.63	NA	2.86	2.30
Kannauj (DS)	NA	1.05	3.03	3.00	2.74	2.47
Kanpur (US)	7.17	1.13	2.70	1.62	1.67	1.88

Kanpur (DS)	8.57	3.50	3.45	65.88	25.00	24.46
Allahabad(US)	11.40	2.58	2.58	2.33	1.95	1.84
Allahabad(DS)	15.50	2.33	2.03	1.65	1.93	1.88
Varanasi(US)	10.13	3.00	2.26	1.18	0.89	0.79
Varanasi(DS)	10.60	3.95	5.94	1.89	1.31	0.95
Patna (US)	1.95	0.35	0.30	1.37	1.16	1.23
Patna (DS)	2.20	0.40	0.33	0.85	1.55	1.50
Rajmahal	1.80	0.20	0.30	1.04	0.57	0.70
Palta(US of Calcutta)	NA	1.00	0.91	0.83	0.95	0.88
Uluberia (DS of Calcutta)	NA	0.93	0.97	0.84	0.97	0.85

N A = not available, US = upstream, DS = downstream

It was mentioned in the records of GPD that for the period from 1991 to 1993, BOD level at Kanpur had been recorded at ten times the actual levels which meant that the BOD level at Kanpur was within the permissible limit in 1992 and 1993. On the other hand, GPD admitted in January 1994 that BOD levels were higher at Kanpur due to non-completion of STPs. Moreover, as per the Annual Report of CPCB for 1992-93, BOD levels at Kanpur and Varanasi were 39.5 mg/l and 7 mg/l respectively which were beyond the permissible level of 3 mg/l. Apparently, the data compiled by GPD could not be treated as totally correct and reliable. There were other reasons for not treating the data compiled in the foregoing tables as truly representing the pollution level of the river. Data collected by various agencies between 1986 and 1990 were only at 1/2 water width (midstream). Though subsequently data were collected at 1/4, 1/2 and 3/4 water widths, GPD generated reports only on the basis of 1/2 width data for the sake of consistency with pre-1990 data. It was also stated by GPD (August 1994) that BOD and DO levels at Kanpur and Varanasi reported in the CPCB Annual Report 1992-93 were based on 1/4 width data. In the absence of uniform and consistent practices being followed in collection and presentation of data, no firm conclusions

could be drawn regarding the impact of GAP on the pollution level of Ganga.

The water quality modelling exercises carried out by GPD revealed that water quality at Kanpur would not improve unless the lean flow of water in the stretch between Hardwar and Allahabad is augmented. In September 1989, CGA agreed to the construction of a gated barrage at Kanpur for which the Ministry of Water Resources were asked to initiate action. The proposal for construction of gated barrage submitted by Government of UP in November 1993 was yet to be approved.

GPD admitted in August 1994 that the bacterial load (coliform count) was in excess of the maximum permissible for bathing at all the sampling points. Though as per the prescribed standards, bacterial load has to be brought and maintained below the level of 10000 per 100 ml, the schemes under GAP did not provide for control of the bacterial load. Since STPs were not designed to take care of the coliform count, the Monitoring Committee recommended (September 1992) that schemes for the reduction of bacterial load in the effluent from the STPs should be formulated. GPD stated (December 1994) that three research projects in this regard were in various stages of progress.

(ii) Functioning of STPs

As per recommendations of the Steering Committee, the treated effluent to be discharged from STPs was to contain less than 30 mg/l of BOD and less than 50 mg/l of suspended solids **(SS)** for discharge into water and less than 100 mg/l of BOD and 200 mg/l of SS for land/irrigation application. The prescribed standards were not being met in all cases. For instance, the discharge from Howrah Treatment Plant, commissioned in

March 1990, indicated BOD above 40 mg/l and SS above 64 mg/l in August 1992 which were beyond the acceptable limits.

In August 1994, on the basis of data supplied by CMDA, the Steering Committee concluded that out of 15 STPs commissioned in West Bengal, seven were not being maintained properly and as a result, the treated effluents were not meeting the requisite standards.

Performance evaluation of the 80 Mld STP at Dinapur, Varanasi was conducted by the National Environmental Engeering Research Institute, Nagpur in June 1994 and the STP was found to be overloaded. The final effluent was found to be below the prescribed standards for surface disposal. The poor performance of the plant was attributed to overloading.

(iii) Assessment by Universities/Institutions

The work of critically monitoring and evaluating the schemes of GAP was entrusted in 1992 to four institutions viz. Roorkee University, Motilal Nehru Regional Engineering College, Allahabad, Patna University and Jadavpur University, who submitted their final reports between July and November 1993. The evaluation covered assessment of success and impact of GAP schemes carried out in Uttar Pradesh, Bihar and West Bengal.

The evaluating teams assessing the performance of various STPs observed the following:

The STP at Diesel Locomotive Works, Varanasi (UP) was treating 5-6 Mld of sewage against the designed capacity of 12 Mld. The performance of the 80 Mld STP at Dinapur, Varanasi (UP) had not stabilised as reflected by the quality of the effluent (BOD upto 100 mg/l). The

evaluation team recommended an in-depth study to identify the causes of poor performance and suggest remedies. GPD stated (January 1995) that the plant at Dinapur was working as per MEF norms.

Out of 160 Mld sewage intercepted and diverted in Kanpur (UP), only 5 Mld was being treated by the Upflow Anaerobic Sludge Blanket pilot plant at Jajmau, Kanpur.

The oxidation ponds at Farukhabad and Fatehgarh in UP had been commissioned but the effluent had not started flowing out.

The 45 Mld STP in Saidpur, Patna (Bihar) was shut down for more than six months between August 1992 and June 1993 due to mechanical faults and dumping of undesirable solids by encroachers.

The sewer lines of Patna (Bihar) remained choked and started overflowing in minor rains. The malfunctioning of city sewerage was due to dumping of sullage, hay and grass and other solid wastes by the city dwellers in the sewer and involvement of too many agencies in the work of development of sewerage system at various times.

In Bhatpara (West Bengal), a portion of the sewer was not laid because of adverse soil conditions.

5.1.12. Low Cost Sanitation (LCS)

(i) Under the LCS Schemes of GAP, 55163 toilets (52400 individual and 2763 community toilets) were to be constructed in selected cities near the bank of Ganga to prevent pollution from human defecation. The number of toilets sanctioned and constructed as on 31 March 1994 is given below :-

State	No. of toilets sanctioned		No. of toilets actually constructed		Shortfall	
	Individual	Community	Individual	Community	Individual	Community
UP	24965	189	20282	183	(-)4683	(-)6
Bihar	6725	116	6725	116	-	-
WB	20710	2458	20698	2458	(-) 12	-
Total	52400	2763	47705	2757	(-)4695	(-)6

(ii) A test check of LCS schemes revealed that in respect of four schemes of LCS at Chapra, Patna, Munger and Bhagalpur in Bihar, the actual expenditure amounted to Rs 4.41 crores against the sanctioned cost of Rs 3.64 crores thereby resulting in cost overrun of Rs 0.77 crore. Similarly in five schemes of LCS in West Bengal, a total expenditure of Rs 3.99 crores was incurred against the sanctioned cost of Rs 3.16 crores, the cost overrun being Rs 0.83 crore. In one LCS scheme at Varanasi (UP), there was a cost overrun of Rs 0.30 crore as the actual expenditure was Rs 1.13 crores against the sanctioned cost of Rs 0.83 crore. LCS scheme at Mirzapur (UP) involved construction of 15 community toilets and 7223 individual toilets at a sanctioned cost of Rs 2.24 crores. Upto March 1994, only 13 community toilets and 3908 individual toilets had been completed but the actual expenditure of Rs 2.27 crores had already exceeded the sanctioned cost by Rs 3 lakhs. GPD stated (December 1994) that the State Governments had been directed (November 1994) to seek reauthorisation from the competent authority for all schemes where expenditure exceeded the sanctioned cost by ten **per cent.**

(iii) The scheme of LCS did not provide for payment of implementation or supervision charges for construction of individual toilets, yet the executing agency in Bihar was allowed (1986-90) Rs 13.88 lakhs as implementation

charges by BRJP. Similarly, in UP, an amount of Rs 5.84 lakhs was paid as supervision charges for LCS scheme at Kanpur.

5.1.13. Electric Crematoria (EC)

Under GAP, 33 electric crematoria were to be constructed. State-wise position of construction of EC as on 31 March 1994 is given below:

State	No. of EC to be constructed	No. of EC actually constructed	No. of EC under construction
Uttar Pradesh	4	4	-
Bihar	9	9	-
West Bengal	20	17	3
Total	33	30	3

The test check of functioning of EC revealed the following:

(i) EC at Mokama-Barauni and Pahlezaghat, Patna in Bihar commissioned during November 1992 and March 1990 respectively were not brought to use due to inadequate power supply, whereas EC at Birzunala (West Bengal) and Shuklaganj, Kanpur (UP) constructed in March 1990 and March 1991 respectively were not made operational. The reasons were not furnished by GPD. The utilisation of EC at Hardwar and Bhagwatdas ghat (UP) was meagre due to lack of motivation of the community. GPD stated (December 1994) that EC at Kanpur has been commissioned in May 1994. It was further stated that action has been taken to ensure full utilisation of EC.

(ii) The responsibility of O&M of electric crematoria lies with the State Governments. BRJP in Bihar spent Rs 20.02 lakhs on the O&M of the electric crematoria and met this expenditure from GAP funds which was irregular. GPD

stated (December 1994) that the matter would be taken up with the State Government.

(iii) The work of construction of a building for EC at Shankarghat, Allahabad (UP) was awarded to a contractor in May 1990 for Rs 11.45 lakhs for completion by June 1990. Due to unsatisfactory progress of work, the contract was terminated in June 1991 after execution of work valuing Rs 1.75 lakhs. The left over work was awarded to another contractor in October 1991 for Rs 13.79 lakhs and was completed in November 1993 for Rs 14.48 lakhs. The extra cost of Rs 4.78 lakhs was not recovered from the original contractor and instead, the Nagar Nigam, Allahabad approved (February 1994) payment of Rs 0.23 lakh as security deposit, Rs 0.58 lakh as value of work done but not paid and Rs 0.06 lakh being the amount withheld earlier, to the first contractor.

5.1.14. River Front Development (RFD)

The number of bathing ghats developed or constructed up to 31 March 1994 under RFD scheme of GAP is indicated below:

State	No of ghats to be constructed	No of ghats actually constructed	Shortfall
Uttar Pradesh	44	43	1
Bihar	10	10	-
West Bengal	75	75	-
Total	129	128	1

Test check of the construction works of a few ghats revealed that against the sanctioned cost of Rs 4.02 crores, the actual expenditure was Rs 4.49 crores for three schemes of RFD at Farukhabad, Allahabad and

Varanasi in UP. The cost overrun was Rs 0.47 crore. Similarly, in eight schemes of RFD in West Bengal, total expenditure was Rs 1.96 crores against the sanctioned cost of Rs 1.75 crores thereby resulting in cost overrun of Rs 0.21 crore.

5.1.15. Water quality monitoring and Research & Development

(i) Apart from ensuring that the quality of water remained at least of the bathing standard, GAP had aimed at monitoring as many as 42 pollution parameters (including 17 parameters relating to heavy metals and pesticides). The work was initiated in 1986 through R&D projects of GAP. The actual monitoring work was executed by the Central Pollution Control Board **(CPCB)**, the Industrial Toxicological Research Centre **(ITRC)**, Lucknow, the Indian Agricultural Research Institute **(IARI)** and the State Pollution Control Boards **(SPCBs)**. In February 1993, the Monitoring Committee, on the advice of their Expert Group, decided to restrict the monitoring of data to 21 parameters (including 7 relating to heavy metals and pesticides). The work on the revamped water quality monitoring scheme started with effect from October 1993 for a period of two years through CPCB, UPSPCB and some other scientific institutions/universities.

(ii) The main thrust of R&D projects was on the applied aspects of research and on supporting such other projects as could provide results for incorporation into GAP for better management of the river.

In March 1986, the Steering Committee had agreed that specific schemes for bio-conservation of the river should be taken up. The projects for bio-conservation were either incomplete or where completed, the results were yet to be evaluated.

(iii) A project titled "Micro level intensive monitoring of water quality of river Ganga at Hardwar, Rishikesh, Kanpur, Allahabad and Varanasi" was approved (November 1986) for execution by UPSPCB for four years. From April 1988, GPD decided to route the sampling and analysis of data through CPCB as the data submitted by UPSPCB earlier contained unusual values of BOD and DO on account of wrong sampling procedures. The project was completed in March 1990. In GAP Research Review Workshop held during December 1990 it was brought out that flow measurements of nalas and rivers at various stations could not be made by UPSPCB for want of facilities; the data remained qualitative and could not be properly corelated. GPD as such could not draw any specific conclusions from the project on which expenditure of Rs 31.96 lakhs had been incurred.

(iv) A project titled "Measurement of Ganga river quality (heavy metals and pesticides)" was awarded to ITRC in July 1986 for a duration of three years. After one year, ITRC suggested (June 1987) the inclusion of river sediments for monitoring. However, in the absence of approval from GPD, ITRC continued the analysis of data on water level alone. The project was extended upto June 1992 and the total expenditure amounted to Rs 56.12 lakhs. Out of this, one Gas Liquid Chromatograph (GLC) purchased for Rs 6.63 lakhs had not been installed till May 1994. On completion of the project, ITRC in its progress report for the period ending June 1992 reported heavy spatial and temporal variations and again suggested the need to include bed sediment, suspended matter and some catchment soil for proper monitoring of fluctuations in heavy metals. ITRC also submitted a new project proposal in October 1992 which was yet to be approved (June 1994).

GPD accepted the facts and stated (August 1994) that further analysis of sediment has been planned in GAP phase-II. It was further stated (December 1994) that as a result of this study, pesticides found persistently in water were taken up with the Agriculture Ministry for possible ban on use in that sector and reduction in production of certain harmful pesticides used in the health sector.

(v) The project titled "Contribution of agricultural application of pesticides to quality of ground and river water" was sanctioned to IARI in March 1990 for three years for Rs 32.72 lakhs. The project was completed in March 1993. The final report submitted by IARI in November 1993 was silent on one of its main objectives which was to suggest ways and means to mitigate and reduce water pollution due to pesticides without jeopardising their use in agricultural production. From the project, IARI concluded that it was necessary to outline a suitable programme for sustainable and judicious pesticide use and consequently to devise a strategy for minimising environmental hazard.

GPD stated (December 1994) that the scope of the project was very vast and IARI has taken it up as a separate project to be funded from their own resources.

5.1.16 Public awareness programme

CGA decided in June 1986 to fix targets for public involvement, public awareness and public participation and to set up a group of non-officials and non-government organisations **(NGOs)** to assist in securing public involvement in the prevention of pollution of the river Ganga. The Monitoring Committee also stated in November 1989 that real involvement of the public in GAP schemes was missing. CGA again directed in February 1991 that public participation may be given high priority by

involving local bodies, social organisations and NGOs through wider publicity and voluntary involvement. The evaluation teams of Universities also suggested the need to increase public awareness towards GAP schemes. GPD did not furnish the information about the activities undertaken for public participation and public awareness programmes. It was, however, noticed that against the budget provision of Rs 1.44 crores during 1989-94 for publicity, the actual expenditure was only Rs 50.43 lakhs out of which Rs 11.10 lakhs was released to NGOs. The underutilisation of the budget provision points to the lack of progress in promoting public awareness and public participation.

5.2 Forest Survey of India

5.2.1 Introduction

In 1965, the Pre-Investment Survey of Forest Resources **(PISFR)** was created to undertake aerial photo-interpretation and forest mapping. In 1981, PISFR was converted to Forest Survey of India **(FSI)** which was reorganised in 1986 under the Ministry of Environment and Forests with the following objectives:

- To prepare a comprehensive State of the Forest Report **(SFR)** including National Vegetation Map (NVM) once every two years and also thematic maps through use of remote sensing data on a ten year cycle.
- 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 surveys and subsequent updating.

- To undertake work in regard to preparation of forest inventory in selected States/Union Territories on agency basis until establishment of their own resources survey units.

5.2.2 Organisational Set up

FSI is headed by a Director and has its headquarters at Dehradun (UP). There are four zonal offices, each headed by a Joint Director at Shimla (Northern Zone), Calcutta (Eastern Zone), Nagpur (Central Zone) and Bangalore (Southern Zone). Besides, six units namely National Forest Data Management Centre **(NFDMC)**, Vegetation Mapping Unit, Training Unit, Machine Data Management Unit, Agency Work Unit and Methodology Unit function at the headquarters.

Against the sanctioned strength of 470, the staff strength as on 31 March 1994 was 432 comprising 264 technical personnel and 168 others.

5.2.3 Scope of Audit

This review mainly covers the implementation of the scheme of introduction of digital image processing techniques and contains a general review of the other activities of FSI.

5.2.4 Highlights

- **Plan expenditure in FSI has consistently fallen short of plan budget allocation.**

  [Para 5.2.5]

- **The expenditure on the scheme "Application of Remote Sensing Techniques in Survey of Forests" was**

Rs 7.45 crores (March 1994), almost twice the sanctioned cost of Rs 4 crores.

Expenditure of Rs 1.94 crores was incurred on procurement (March 1988), installation and maintenance of a digital image processing system upto March 1994. But the equipment was not utilised fully till 1993.

A digital cartographic system, estimated to cost Rs 1.25 crores in 1987 was yet to be procured, the estimated cost in August 1994 being Rs 7.75 crores.

[Para 5.2.6]

- Data regarding the forest cover presented in the SFRs till 1991 were based on visual interpretation and in 1993 only part of the data was based on digital interpretation. State of Forest Reports (SFR) and the data reported in each had to be corrected/adjusted at the time of the publication of the next.

[Para 5.2.7]

- The objective of creation of the National Basic Forest Inventory System was not achieved.

[Para 5.2.8]

- The Seventh Plan target of training 450-500 resource persons in remote sensing techniques was not achieved even by 1993-94; the training unit was not equipped to conduct courses on digital subjects.

[Para 5.2.10]

5.2.5 Budget and expenditure

Budget provision vis-a-vis the actual expenditure of FSI for the period 1989-94 were as under:

(Rs in Lakhs)

Year	Plan			Non Plan		
	Budget	Expen-diture	Varia-tion	Budget	Expen-diture	Varia tion
1989-90	280.00	249.12	(-)30.88	Nil	Nil	Nil
1990-91	230.00	159.45	(-)70.55	150.00	149.51	(-)0.49
1991-92	190.00	93.91	(-)96.09	158.00	163.76	(+)5.76
1992-93	190.00	121.56	(-)68.44	170.98	179.56	(+)8.58
1993-94	805.00	114.88	(-)690.12	190.00	189.93	(-)0.07
Total	1695.00	738.92	(-)956.08	668.98	682.76	(-)13.78

The table shows that during the period 1989-94, more than 50 **per cent** of the plan funds allocated by Government could not be utilised by FSI indicating tardy progress of the plan schemes. In particular, during 1991-94, FSI had to surrender Rs 8.36 crores of plan funds which had been allotted by Government for procurement of a digital cartographic system. This has been discussed in detail elsewhere in this Audit Review.

5.2.6 Application of Remote Sensing Techniques in Survey of Forests

In July 1987 Ministry of Environment and Forests **(MEF)** sanctioned Rs 4 crores for the scheme "Application of Remote Sensing Techniques in Survey of Forests" and accorded approval for setting up of National Forest Data Management Centre **(NFDMC)** which was to be provided with a

digital image processing and cartographic system and various other facilities. The scheme intended to switch over from the conventional visual method of interpretation of imagery to the digital method. The digital image processing system and the digital cartographic system were to become functional by 1988-89 and April 1991 respectively. The objectives of the scheme were:

- To assess the extent of forest cover and monitor the broad changes in the forest cover of the country, by using multisatellite data.
- To classify the forest cover by density classes.
- To create and maintain forestry data base by collecting, 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.

Against the initial sanction of Rs 4 crores for the scheme, an amount of Rs 7.45 crores has been spent upto 1993-94. Approval of the EFC was not obtained for the revised cost of the scheme, which was estimated at Rs 26.17 crores (August 1994).

The Digital Image Processing System configured around a VAX 11-780 computer costing Rs 1.22 crores. This was to be used for digital interpretation of satellite imagery available in the form of computer compatible tapes **(CCTs)** to get more accurate results than that obtained by visual interpretation.

The system, procured in March 1988 and targeted to become functional in 1988-89, was installed in June 1989 in Forest Research Institute **(FRI)** campus at Dehradun after incurring an expenditure of Rs 22.98 lakhs and put into operation in September 1989. The delay in installation was mainly due to delay in supply of the uninterrupted power supply system. Operationalising the system involved the following three tasks:-

i) To build up a ground control points library for geometrically correcting the raw satellite data.

ii) To build up a ground truth library which was not only to help in classifying the digital data but also in assessing the accuracy of the interpreted results.

iii) To develop a methodology for supervised classification of forests and to define a standard interpretation key for themes which were to be classified on digital images.

FSI stated (November 1994) that various aspects involved in the major tasks were being developed and the ground control points data had been collected for Andhra Pradesh, Orissa, part of Uttar Pradesh, Madhya Pradesh, Himachal Pradesh and Maharashtra.

After commissioning of the digital image processing system in September 1989, two cycles of vegetation mapping (1991 and 1993) were completed. According to the recommendations of a technical committee of MEF in December 1987, interpretation of 1536 quadrants of Computer Compatible Tapes **(CCTs)** was necessary to complete the approved quantum of interpretation for the two cycles. However, FSI purchased and used only 567 quadrants of CCTs for vegetation maps though there were

more than the recommended 12 technical personnel during 1990-94 who were operating in three shifts against the recommended two shifts a day.

In fact, though the digital image processing system became operational in September 1989, it was actually used for digital analysis work only since 1991-92. FSI stated (August 1994) that the recommendations of the technical committee could not be implemented due to delay in installation of the computer system, untrained staff and agitation against shift duty by the staff. Thus an expenditure of Rs 1.94 crores which included the cost of the digital image processing system and its installation and maintenance (upto March 1994) could not yield the desired results even after five years from the installation of the system.

The scheme "Application of Remote Sensing Techniques in Forest Survey" included the setting up of a Digital Cartographic Unit at a cost of Rs 1.25 crores. It was decided in December 1987, in a meeting of the Board of Management of NFDMC that the Department of Space **(DOS)** should take the lead role in setting up the system. Again, in May 1988, NFDMC decided that DOS would deliver, on turn-key basis, a completely commissioned and efficiently functioning digital cartographic system to MEF. By July 1988, DOS submitted an estimate of Rs 4 crores for the work which was not acted upon by NFDMC who desired that a revised consolidated proposal for implementation of the entire scheme covering the digital image processing system and the digital cartographic system should be prepared. The revised proposal was sent to MEF in February 1989 but was not sanctioned.

In December 1989, MEF decided to entrust the work to Computer Maintenance Corporation, which was also

responsible for the computer system of DOS and sanctioned Rs 73 lakhs for the job of renovation of the site. The entire amount was paid to CMC before the completion of the work. But by December 1990, it was found that the premises of FRI, where the equipment was to be installed, was not at all suitable for the purpose and FSI informed CMC (March 1992) that the system was to be installed in the new building of the FSI. It was also decided that the work would be carried out by the Civil Construction Unit of MEF. CMC refunded an amount of Rs 48.73 lakhs, being the balance lying with them after adjusting the cost of work already carried out.

While the work of site preparation of the digital cartographic system got delayed because of the initial decision to have it installed in an unsuitable area of FRI [as reported in Para 4.2 of the Report of the C&AG, Union Government (Scientific Departments) for the year ended 31 March 1992] and the change of decision regarding the executing agency, there was no progress in the procurement of the equipment.

An agreement was signed in December 1990 between FSI and CMC for the latter to handle the procurement, installation and commissioning of the system on consultancy basis. Rs 4.5 lakhs, being 50 **per cent** of the agreed consultancy fee of Rs 9 lakhs, was paid to CMC as advance. However, the final decision regarding procurement of the equipment was yet to be taken by MEF more than seven years after the scheme had been sanctioned. MEF stated (February 1994) that the process of acquisition of the digital cartographic system through global tender had not yet been finalised and the configuration of the system to be installed was also not fully decided. Meanwhile, the digital cartographic

system, originally estimated to cost Rs 1.25 crores, was estimated in August 1994 to cost Rs 7.75 crores.

5.2.7 The State of Forest Reports

One of the primary objectives of FSI was to prepare the "State of Forest Report" **(SFR)** which was to be updated every two years. The report was intended to be an analytical study of the dynamics of the forest cover in the country. FSI published four reports in 1987, 1989, 1991 and 1993.

The data presented in the SFRs have been based on visual interpretation till SFR 1991. It was only in the 1993 SFR that for the first time a part of the data (for parts of Uttar Pradesh, Madhya Pradesh, Bihar and Himachal Pradesh) was based on digital interpretation.

Data collected for successive SFRs had undergone changes at subsequent stages.

For the 1989 SFR, forest cover assessment was made on 1:250,000 scale using Thematic Mapper data having spatial resolution of 30 m. For SFR 1987 on the other hand, 1:1000,000 scale had been used with imagery from Multi-Spectral Scanner with spatial resolution of 79 m. So, while publishing 1989 SFR, the data earlier reported in 1987 SFR had to be adjusted in order to have an identical base for comparison. Similarly, while publishing SFR 1991, corrections had to be made for earlier inaccurate interpretation and also because tea gardens, which had earlier been interpreted as forest cover, were declassified for SFR 1991. Likewise, the gross increase of 925 sq km exhibited in the SFR 1993 over SFR 1991 included increase of 700 sq km in an area which had not been interpreted earlier and 203 sq km

because of inaccurate interpretation earlier. Thus there was net increase in Forest Cover reported in 1993 by 22 sq km over 1991.

Since 1987 when the first SFR was published, corrections have continued to be made to data interpreted earlier.

5.2.8. Forest Inventory

Creation of a computer-based National Basic Forest Inventory System **(NBFIS)** was one of the main objectives of FSI. Consequent on reorganisation of FSI in June 1986, its field inventory surveys were confined to the States of Punjab, Haryana, Orissa and the North Eastern States on agency basis till these States were able to establish their own resource survey units. While FSI conducted the survey in these and some other States, data were not received by FSI from all the State Forest Departments for processing. FSI had processed a proposal for creation of NBFIS with the objective of creating, storing and retrieving necessary forest and forestry-related data for national and state level planning, but the scheme was not sanctioned by MEF. The result was that even in SFR 1993, data presented by FSI mainly reflected the work done prior to 1986 and much of the data had been collected before 1980.

5.2.9. Development of Methodology :

The Methodology Unit was to develop techniques and processes for :

i) vegetation and thematic mapping
ii) inventory design for State adaptation and
iii) ground truth verification.

Though the unit was created in 1986, there was no qualified manpower during 1989-93.

As regards inventory design for adaptation by State Governments, FSI stated that a new methodology for non-forest inventory had been developed and circulated to the zonal offices in October 1991. In its first meeting held in December 1987, the expert committee on methodology decided to evolve a methodology for ground verification of landsat imagery interpretation and to prepare training sets for VAX computer system. As a first step it was decided that one scene in each of the States namely Karnataka, Himachal Pradesh, Manipur and West Bengal was to be selected and interpreted both manually and digitally and the two interpretations compared after intensive ground verification. This comparison was to be fed into the computer for auto adjustment of satellite imagery interpretation. FSI did not furnish specific information about the progress or completion of this job.

FSI stated (June 1994) that suggestions for updation of methodology relating to thematic/vegetation maps, forest inventory survey and ground truth verification were received from zonal offices and were under scrutiny.

5.2.10. Training

MEF assigned to FSI the task of conducting training in the application of remote sensing techniques, inventory management, data processing and banking and also of securing and coordinating opportunities in close liaison with MEF for higher level specialised training in India and abroad.

The training unit of FSI had only three technical personnel. The post of Joint Director, to head the

training unit has remained vacant for long. There was marginal shortfall in training targets due to fewer persons being sponsored by the State Governments. In all 67 technical personnel of FSI and 100 trainees from other departments were trained in the application of remote sensing techniques. Thus, the level of 450-500 resource persons fixed by MEF for training in remote sensing techniques during the Seventh Five Year Plan was not achieved even by 1993-94. Three courses on digital data processing were conducted during 1992-93 and 15 personnel of FSI were trained but FSI admitted in May 1994 that the training unit was not fully equipped with the necessary infrastructure to conduct courses on digital subjects.

The Annual Plan for 1989-90 envisaged that FSI would be one of the regional centres for organising Food and Agriculture Organisation (FAO) sponsored training courses on remote sensing, electronic processing of forest inventory data and other allied subjects. Training courses were to be organised in India exclusively for Indian officers as the country needed a large cadre of trained officers in modern inventory techniques. No such courses were conducted.

During 1988-89 and 1989-90, the training unit provided 35 and 29 weeks of training respectively. This declined to 18, 11, 17 and 12 weeks respectively in 1990-91, 1991-92, 1992-93, and 1993-94. Given the need for training a large number of forest officials in remote sensing techniques and digital data processing, there appears to be an urgent need to strengthen and activise the training unit of FSI.

5.3 Budget Management

Review of Appropriation Accounts of the Ministry of Environment and Forests for the five years 1989-94 revealed that heavy re-appropriations were made under various heads as the trend of expenditure did not match the budget estimates. The trend of heavy re-appropriation under certain sub-heads continued for years showing that while framing the budget estimates, the Ministry did not take into account trend of actual expenditure in the preceding years. Details are given in Appendix-III.

It was also seen that even after re-appropriation of funds, there were huge excess/savings under the various sub-heads which indicated that realistic assessment of requirement of funds was not made even at the time of issuing the re-appropriation orders. Details are given in Appendix-IV.

Some illustrations where the actual expenditure was much less than the original grant and the savings were on the higher side are given below:-

(Rs in lakhs)

Year	Sub-head	Original grant	Grant after re-appro-priation	Actuals	Saving
1993-94	2406 B. 3(1)(4) Integrated Afforestation and Eco Deve-lopment Projects	500.00	500.00	99.99	-400.01

1993-94	2406 C.3 (4) (4) Eco Development Forces	450.00	450.00	236.24	-213.76
1993-94	2406- C.4(2)(5)(1) Externally Aided Scheme	300.00	242.30	39.74	-202.56
1993-94	2406- C.4(2)(7) Pollution Control Projects (Externally Aided Scheme)	400.00	400.00	40.00	-360.00
1993-94	2406- C.5(1)(3) Environmental Commission and Tribunal	100.00	100.00	-	-100.00

CHAPTER VI

Ministry of Mines

(Geological Survey of India)

6.1 Avoidable payment of Customs Duty

Scientific/technical equipment imported for research activities are not subject to payment of customs duty if the required 'Not manufactured in India' **(NMI)** and 'Customs duty exemption' **(CDE)** certificates are furnished to the customs authority before customs clearance. It was seen in audit that because of the failure of the Geological Survey of India **(GSI)** to apply for NMI and CDE certificates in time, avoidable customs duty to the extent of Rs 11.50 lakhs was paid in the following case.

GSI, before importing three "Geologers" in June 1986 did not apply for 'NMI' and 'CDE'certificates in time. These certificates were requested only in December 1986 and received from Ministry of Mines and Director General, Technical Development respectively in March 1987. Consequently, GSI had to incur an expenditure of Rs 11.50 lakhs towards payment of customs duty in December 1986.

Besides, the claim for refund of customs duty was preferred in November 1989 i.e. after 35 months instead of within permissible limit of 12 months from the date of payment of duty. Thus the Department was not able to get refund of Rs 11.50 lakhs. GSI stated in October 1994 that the case was being pursued with the Collector of Customs (Appeal).

CHAPTER VII

Department of Science & Technology

7.1 Bose Institute

7.1.1 Introduction

The Bose Institute, Calcutta was set up as an autonomous body in November 1917 for the advancement of knowledge in areas of life sciences by means of research and diffusion of knowledge by organising discussion, demonstration and lectures etc. The Institute receives grants-in-aid from Department of Science and Technology **(DST)** since 1972-73.

The Institute is headed by a Director and managed by a Governing Body. The Governing Body which is the highest authority of the Institute is assisted by a Council which is responsible for management of the affairs of the Institute.

The Institute has 417 sanctioned posts of which 73 are scientific personnel. As of April 1994, it had 352 personnel of which 57 were scientists.

The income of the Institute comprise mainly of grants from Department of Science and Technology and from other agencies for various sponsored projects. The position of receipts and expenditure during the period 1989-94 was as under:

YEAR	RECEIPTS				PAYMENTS (Rs in lakhs)				
	Grant from DST	Funds received under Grants-in-Aid Schemes	Others	Total	Salaries Estt.& Maintenance	Laboratory expenses	Assets	Expenditure on grants-in-aid schemes	Total
1989-90	251.00	136.97	3.36	391.33	223.93	14.78	19.68	81.60	339.99
1990-91	304.00	275.81	4.76	584.57	242.54	16.67	67.54	138.07	464.82
1991-92	335.00	108.43	17.82	461.25	238.49	27.20	94.77	207.47	567.93
1992-93	379.00	120.70	6.60	506.30	290.70	21.39	50.24	187.85	550.18
1993-94	424.00	166.54	8.34	598.88	310.06	30.03	92.92	175.28	608.29

7.1.2 Institutional projects

Research activities of the Institute are carried out through in-house inter-disciplinary projects and grants-in-aid projects funded by other agencies. A Review Committee constituted by DST in April 1983 was to explore and suggest means of revamping the Institute and for further development.

Research identification, planning & monitoring

Project identification in the Institute is done entirely by individual scientists. The Institute did not have any well defined mechanism to evaluate, assess and monitor the progress of research like peer review or review by Scientific Advisory Committee. A Scientific Advisory Committee **(SAC)** was formed in June 1994 to monitor the research programmes twice a year and give suggestions for their selection, improvement and upgradation. In September 1990, the Council of the Institute approved the reconstitution of the Academic

Council **(AC)**, set up earlier as recommended by the Review Committee. The reconstituted Academic Council was to formulate institutional projects and find out ways of improvement of activities in the on-going projects and to suggest ways and means to encourage inter-institution collaborations. However, the Secretaries of the Academic Council stated in June 1994 that no clear cut decision had yet been taken in this regard by the Council and as such it had not been possible to undertake this duty.

In response to an audit query regarding the current system of monitoring and evaluation of projects, the Institute stated (November 1994) that under several umbrella projects, there were many sub-projects on which individual scientists worked. The Director reviewed the performance and progress of individual projects through periodical meetings. Each scientist normally wrote the progress report and these were consolidated annually by a Central Committee and included in the Annual Progress Report of the Institute. The Institute provided lumpsum recurring grants to the Departments/Sections which managed their own projects within these allocations.

While reviewing the performance of the Botany Department, the Review Committee had noted (1984) that the activities of the Department were too diversified for supporting them at the optimum level and recommended that some of the activities should be phased out to enable consolidation of the more productive ones. The Scientific Organising Committee, set up by the Institute at the time of its Platinum Jubilee celebrations in 1993, also recommended in its report (March 1993) that the Botany Department required a greater focus and should move from work of a more routine type to a greater target orientation. The Institute stated (May 1994) that the recommendation of the Scientific Advisory Committee would be placed before the Council. Obviously, no action had

yet been taken to reorganise the work of the Botany Department by the Institute.

Grants-in-aid projects

During 1989-94, 47 grants-in-aid projects funded by outside agencies were taken up by the Institute of which 44 were completed during the period. The total amount received during 1989-94 from sponsoring authorities was Rs 8.08 crores of which Rs 7.90 crores were spent. As of 31 March 1993, Rs 78.46 lakhs were lying with the Institute out of grants from funding agencies for 138 projects and Rs 27.98 lakhs had been spent by the Institute in excess of the funds received in respect of 81 projects. The funding agency released the last instalment upon termination of the project and the Institute had to allow excess expenditure in anticipation of its subsequent release. However, in four cases (Rs 4.43 lakhs), the sponsors refused reimbursement of expenditure since the Institute had not obtained their prior approval before incurring expenditure on items not contemplated in the projects.

The Institute set up a Centre for Plant Molecular Biology **(CPMB)** with financial support of Rs 2.39 crores from DBT in 1991-92. The Project was to be completed within a period of five years and no financial support was to be provided thereafter. Total amount sanctioned upto 1993-94 was Rs 1.65 crores.

Under the project, DBT provided non-recurring grant of Rs 82.30 lakhs for equipment and Rs 30 lakhs for special facilities including laboratory remodelling. However, against the total amount of non-recurring grants of Rs 1.12 crores for the project, the Institute spent Rs 1.18 crores on purchase of equipment alone. Vital

components of the project like developing, remodelling and revitalising the Central Facility and the field laboratory facilities were not taken up. This delayed the development of the Centre. The Institute stated (November 1994) that the situation arose owing to increase in the cost of the equipment purchased and DBT did not make available any additional grants, despite earlier assurances.

The project had an approved complement of 27 posts including scientific/technical posts and other posts. The recruitment against scientific/technical posts was to be made out of the DBT sponsored post-graduate/post-doctoral course fellows. The post of Associate Professor could not be filled up for want of any suitable candidate. The scientific and technical posts were not filled in from DBT sponsored post-graduate/post-doctoral course fellows. The Institute stated in June 1994 that there had been delays in recruitment which adversely affected the project work.

Interlec-14

The 14th International Lectin meeting was organised by a Committee in May 1992 with a scientist of the Institute as convenor and the Registrar as the treasurer. Funds were raised in the name of the Institute. UNESCO released US $ 20 thousand for the meeting to the Director, Bose Institute. The cheque was encashed by the convenor through a separate bank account "Inter-lec 14" without the endorsement of the Director. The amount was not deposited in the account of the Institute. However, an amount of Rs 0.50 lakh received from DST in June 1992 for the meeting was deposited in the Institute's account. Out of this amount, Rs 0.49 lakh appeared in the Institute's Balance Sheet as at 31 March 1993 after adjustment of outstanding dues against the convenor in

respect of some earlier conference held in 1989-90. The organisers had not furnished (September 1994) the final account and report in respect of Inter-lec 14 to the Institute.

The Institute stated (December 1994) that Inter-lec 14 was not organised by the Institute, these funds were not to be mixed up with the Institute's funds and the accounts were not to be audited by the CAG of India. The argument is not tenable as the funds were released by UNESCO in favour of the Director of the Institute. Besides, since DST had also released grants for the meeting to the Institute, it was necessary for the Institute to have accounted for the expenditure on the meeting.

7.1.3 Research results

During 1989-94, 107 scholars obtained PhD degrees and 558 papers were published. There is no system in the Institute to evaluate the quality of research papers in terms of science citation index and impact factors. Till 1992-93 no patent was filed nor was any technology or process developed. The Institute stated in June 1994 that the Institute has been showing continuous growth and development during the past two years and three patent applications had been submitted for the first time, but none had been registered so far. It was further stated that in at least three major areas where laboratory level work was complete, the technology package could not be developed because of shortage of funds and equipment.

The Review Committee in 1984 had recommended that certain Animal Physiology findings about silkworms be urgently evaluated jointly with the Indian Silk Research and Training Institute at Mysore. The findings were yet to be evaluated (November 1994).

7.1.4 Stores and stocks

The Registrar of the Institute is empowered to incur an expenditure on purchase of stores upto an amount of Rs 10000 in each case. The Director enjoys full powers subject to budget provision. During audit, 76 purchase files, each involving purchase of more than Rs 1 lakh, were scrutinised and it was seen that sanction of the Director was not obtained in any of those cases. It was also noticed that some purchases were made (mostly in cases of grants-in-aid projects), where budget provisions did not exist. The Institute stated (December 1994) that after the irregularities were pointed out by Audit, purchase orders above Rs 10000 were being issued with the prior approval of the Director.

The Institute placed an order on a UK firm in February 1990 for supply of a Model SP-70 D Nanosecond Fluorescence Lifetime Spectrometer for use in their Post-Doctoral Training Programme. The order was placed on the firm on a single tender basis without recording sufficient reasons. In April 1990, the Institute requested the foreign supplier to withhold the supply for some time as the scientists were reviewing their work programme. In August 1990, the order was formally cancelled by the Institute. But the firm did not accept the cancellation and threatened legal action. In the meeting (September 1990) on implementation of Post-Doctoral Training Programme it was decided to procure the equipment without further loss of time.

The Institute stated (June 1994) that in the absence of a regular Director there was some confusion over the Post-Doctoral Programme. At the time of placing the order the value of the equipment was Rs 15.81 lakhs. But due to the cancellation and subsequent delay in opening the letter of credit the cost of the equipment increased to

Rs 18.07 lakhs. The extra expenditure amounting to Rs 2.26 lakhs was incurred due to fluctuation in exchange rate. The equipment was received by the Institute in June 1991 and could be installed only in July 1993. The delay was attributed to non-completion of infrastructural facilities in time and inability of the Indian agent to complete the work. It was also seen that the equipment was not used after January 1994. The Institute stated in June 1994 that the equipment was definitely procured keeping an eye on its utility and efforts would be made to raise the use of the instrument to the optimum level. However, the Institute stated in December 1994 that the equipment is primarily used in biopolymer conformation and protein engineering branches of the Post-Doctoral programme and the initial recruitment in the programme was mainly in streams other than these, requiring only a minimal adjustment of the programme for non-functioning of this particular equipment. This is not in line with the urgency shown for purchase of the equipment in the meeting held in September 1990 and the Institute's assertion in June 1994 regarding the procurement of the equipment keeping in view its utility.

The Institute placed an order on a foreign firm in January 1990 for supply of a Spectropolarimeter for use in the Post-Doctoral Training Programme at a cost of Yen 8.39 million (Rs 10.18 lakhs). The equipment was received in the Institute in August 1990. Payment of the agency commission was made in September 1990. The installation work could not be taken up immediately after its receipt as the infrastructure for the installation was not ready. Site preparation was completed in September 1991 by which time the guarantee period had expired. In the course of installation by the Indian agent some parts were found defective and the equipment was finally made operational in May 1993 after

replacement of the defective parts. Thus, the equipment could not be used for the Post-Doctoral Training Programme for two and half years after it was procured.

In January 1990, the Institute purchased one 471A-00 Isocratic Protein Peptide Sequencer from a foreign firm at a cost of US $ 1.04 lakhs (Rs 18.18 lakhs) for use in the Post-Doctoral Training Programme. The purchase was made on a single tender basis. The consignment was received in August 1990. The installation work could not be taken up immediately after its receipt because the specially fabricated air-conditioned room was not ready. The infrastructure became available in September 1991, one year after receipt of the equipment. Agency commission was paid in September 1990 before installation of the equipment. The equipment could be finally installed only in May 1993, but it did not give satisfactory service after its installation. The Institute stated in December 1994 that although the performance of the sequencer was unsatisfactory after installation, a full fledged investigation and resolution of the problem was not possible due to repeated change of agents and principals. Obviously the eventuality was not foreseen and provided for in the purchase contract.

7.1.5 Physical verification of stores

Physical verification of stores was conducted upto 1988 and no verification report for 1988 was made available to Audit. In the absence of periodic and complete physical verification the correctness of stores could not be vouchsafed and the possibility of misappropriation could not be ruled out. The Institute stated in December 1994 that verification of stock of some departments/sections had since been completed and steps had been taken to complete verification of the entire stock within the next financial year.

7.1.6 Estate management

The Institute had 3 farms in the vicinity of Calcutta and one experimental station at Darjeeling. The farms did not generate any income and the experimental station of Darjeeling carried out no research activity.

Construction of a five storey Annexe building at the Centenary campus was taken up by the Institute to accommodate its future needs. The proposal for the construction was considered by the building committee of the Institute constituted by the Council with a representative of DST in June 1979. The construction was approved in part by the Tender Committee **(TC)** in their meeting held in December 1980. The cost of the building was estimated at Rs 50 lakhs but considering the resource crunch, a sum of Rs 6.70 lakhs was approved and allocated to start the foundation work. The work comprising timber pile foundation and part ground floor works of the five storey building was awarded to a firm at a cost of Rs 6.86 lakhs in December 1980. Construction work was discontinued after completion of piling work and a part of the ground floor due to non-allocation of funds by DST and some major changes in key administrative positions in the Institute. An amount of Rs 8.49 lakhs was spent on this work till 1987-88. No expenditure was incurred thereafter. Thus the decision to construct the building without arranging for adequate funds resulted in blocking of an amount of Rs 8.49 lakhs since 1987-88.

The Institute stated in December 1994 that land, building and property situated in and within the vicinity of Calcutta were being optimally used and the construction work would be undertaken in accordance with the availability of funds.

7.1.7 To sum up, the Institute did not have a well defined mechanism to evaluate, assess and monitor the progress of research. No patent was filed nor was any technology developed till 1992-93. Review Committee's recommendation of 1984 in regard to evaluation of certain Animal Physiology findings about silkworms was yet to be implemented. The equipments purchased and the land and buildings of the Institute were not optimally utilised.

CHAPTER VIII

Department of Space

8.1 Budget Management

Review of Appropriation Accounts of the Department of Space for the three years 1991-94 revealed that heavy re-appropriations were made under various heads as the trend of expenditure did not match the budget estimates. The trend of heavy re-appropriation under the same sub-head continued for years showing that the Department did not take into account the drift of actual expenditure in the preceding years while framing the budgetary estimates. Details are given in Appendix-V.

It was also seen that even after re-appropriation of funds, there were huge excess/savings under the various sub-heads which indicate that proper assessment of requirement of funds was not made even at the time of issuing the re-appropriation orders. Details are given in Appendix-VI.

Some illustrations where the Department had issued re-appropriation orders though the actual expenditure was much less or much more than the original grants are given below:

Year	Sub-head	Original grant	Grant after re-appropriation	Actuals	Saving (-) Excess (+)
			(Rs in lakhs)		
1991-92	5402 - 88.2 88.2(1)(8)-ISRO Satellite Centre	440	583.12	274.69	(-) 308.43

1991-92	BB.2(1)(10)-INSAT-II Test Space Craft Project	191	106.52	202.85	(+)	96.33
1993-94	5252 - AA.3 AA.3(2)-INSAT-2 Satellites	426	436.11	418.52	(-)	17.59
1993-94	5402-BB.1 BB.1(1)-Vikram Sarabhai Space Centre	8.90	3.30	16.55	(+)	13.25
1993-94	5402 - BB.2 BB.2(1)(10)-IRS Continuation Project	256	344.53	236.97	(-)	107.56

CHAPTER IX

Indian Council of Agricultural Research (ICAR)
(Department of Agricultural Research and Education)

9.1 National Bureau of Plant Genetic Resources

9.1.1 Introduction

National Bureau of Plant Genetic Resources **(NBPGR)** was established in 1976 at New Delhi to conserve the genetic variability of cultivated plants and their wild relatives essential for crop improvement programmes.

9.1.2 Scope of Audit

NBPGR was audited under section 20(1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The present review covers generally the activities of NBPGR for the period 1989-94.

9.1.3 Organisational set up

NBPGR is headed by a Director who is assisted by Scientific Research Council **(SRC)**, Management Committee **(MC)** and Germplasm Advisory Committee **(GAC)**. SRC is responsible for all round progress made in different activities. GAC helps NBPGR by reviewing current status of work, identifying shortcomings and suggesting ways and means to overcome them.

NBPGR has five Divisions, namely (i) Plant Exploration and Collection (ii) Germplasm Exchange (iii) Plant Quarantine (iv) Germplasm Evaluation and (v) Germplasm Conservation. There are 12 regional stations/base centres located at various places which provide access to

representative agro-ecological conditions for the collection of genetic wealth. It has a 40 hectare experimental farm at Issapur (about 45 km west of Delhi).

For the year 1993-94, NBPGR had 545 sanctioned posts of which 262 posts were for scientific/technical work and 283 posts for administrative and auxiliary work. As on 1 April 1994, 107 posts were vacant including 49 posts of scientific/technical staff.

9.1.4 Budget and Expenditure

NBPGR is financed through grants released by the Department of Agricultural Research and Education (DARE) to the Council. The funds are also provided from Agricultural Produce Cess Fund (AP Cess Fund) and by some foreign agencies and other Departments/Ministries of Central Government for special schemes. The provision of funds and expenditure incurred during 1989-94 is given below:

(Rs in Lakhs)

HEADS	1989-90		1990-91		1991-92		1992-93		1993-94	
	RE	Exp.	RE	Exp.	RE	Exp.	RE	Exp.	RE	Exp
Non-Plan	170.00	163.00	196.00	195.00	204.00	204.00	224.00	224.00	240.00	240.00
Plan	100.00	98.29	70.00	35.06	90.00	89.62	110.00	109.92	132.00	132.00
Indo-US-Project	25.00	23.80	25.00	2.57	350.00	350.88	262.74	262.74	732.00	732.00
OBT	61.89	55.52	38.60	28.87	34.72	36.36	31.97	26.46	29.50	26.37

AP Cess Fund (Emeritus Scientists and Rice Research)	1.44	1.00	2.42	1.78	2.52	1.87	1.13	0.85	1.61	0.07
NSP-III(World Bank)	-	-	23.90	4.01	10.10	21.49	4.90	5.25	3.10	1.86
PL 480	-	-	-	-	-	-	6.00	5.31	2.00	1.84
Total	358.33	341.61	355.92	267.29	691.34	704.22	640.74	634.53	1140.21	1134.14

(RE: Revised Estimate, Exp.: Actual Expenditure)

9.1.5 Research projects

Policy planning

To formulate a national policy which can provide clear guidelines and regulations to direct all the on-going activities relating to plant genetic resources, a National Policy Planning and Review Committee on Plant Genetic Resources under the Chairmanship of Director-General, ICAR was constituted in 1986. This committee was to decide on priority areas to give proper thrust to genetic conservation of biological resources in the national context. The Review Committee met only once in December 1986 after which no meeting was held.

Quinquennial Review Team

The Quinquennial Review Team **(QRT)** appointed by ICAR plays an important role in reviewing the working and functioning of NBPGR. The last quinquennial review was conducted for the period 1983-87 (extended upto December 1990) but the final report of the QRT was still not ready for submission to ICAR as of March 1994. NBPGR stated

(December 1994) that QRT's final report was ready for processing.

Monitoring and evaluation

38 Research Project Files **(RPFs)** out of 82 were examined in audit and it was observed that 18 projects were sanctioned for specific limited periods and 20 projects were of continuing nature.

From the project files, it was observed that most of the period-specific projects were still continuing although the period for completion was long over. The RPFs did not indicate anywhere whether these projects had been approved by ICAR.

NBPGR stated (December 1994) that progress of the projects was assessed by SRC as also in the meetings of the Heads of Divisions but it was observed that annual progress reports of the research projects were not sent by NBPGR to ICAR. It was clarified by NBPGR (July 1994) that the RPFs of all projects were being sent to ICAR till 1988 and in view of non-receipt of any comments/response on the reports, no report was sent after 1988. In the absence of annual reports on the progress and status of various projects, it was not clear how funds were released by ICAR for the projects.

9.1.6. Other projects

Indo-USAID Plant Genetic Resources Project

The project was initially sanctioned for a period of seven years upto September 1995 which was extended upto August 1997. Under the project, equipment worth Rs 3.10 crores were supplied to various Institutes upto June 1994. These were not accounted for in NBPGR's accounts including stock registers and asset registers and there

was no system of monitoring the utilisation of imported and indigenous equipment procured under the programme.

NBPGR stated (December 1994) that separate stock and asset registers have now been opened showing the distribution of various items to different institutions.

Maintenance of Issapur farm

NBPGR acquired 100 acres of land at Issapur village on lease for 99 years at Rs 10,000 **per annum** in 1976 from Delhi Administration for research and preliminary evaluation of germplasm collections. Apart from a crop register showing details of various crop samples sown for evaluation, no other record showing the number of accessions evaluated in the farm and the number of seed samples transferred to NBPGR headquarter was maintained. There was also no record to show the number of germplasm samples received in the farm for evaluation and the number of samples evaluated. No targets had been fixed for the number of accessions to be evaluated in the farm during any particular period. NBPGR stated (December 1994) that although effort is made to complete evaluation of collections in three consecutive growing seasons, yet unforeseen weather conditions and other stresses may cause delay in achieving such targets.

Lease charges amounting to Rs 1.70 lakhs had been paid to Issapur village panchayat for the period from 1977-78 to 1993-94 at the rate of Rs 10,000 per year but the lease deed had not been executed. NBPGR stated (December 1994) that steps had been taken to finalise the lease deed.

International Board for Plant Genetic Resources (IBPGR) supported projects

IBPGR funded seven projects through joint work plan for the years 1990-93. No records relating to receipt and utilisation of the amount provided by IBPGR was furnished to audit nor were the transactions included in NBPGR's accounts. NBPGR stated (December 1994) that separate accounts were maintained for the purpose and noted the audit comment for future guidance.

9.1.7 Division of Plant Exploration and Collection

The Division has the responsibility to plan and coordinate explorations for the collection of germplasm in different agri-horticultural crops and their wild relatives from within and outside the country.

Explorations are planned based on the requests from national and international crop based institutes, State Agricultural Universities, State Departments of Agriculture and other user agencies, recommendations of the Germplasm Advisory Committee etc. Explorations with international agencies are carried out after clearance from ICAR.

Explorations undertaken and germplasm collected during 1989- 94 were as detailed below:

Year	Explorations planned	Explorations undertaken	Samples of germplasm collected	Percentage of shortfall
1989-90	70	59	13437	15.71
1990-91	53	49	7021	7.55
1991-92	61	57	6850	6.55
1992-93	64	55	6241	14.06
1993-94	35	21	1755	40.00

Shortfall in planned explorations during the period varied from 6.55 to 40 **per cent.** In many cases explorations had to be abandoned as collaborating scientists from other institutions did not participate in the efforts. The number of explorations undertaken varied from year to year and depended on the requests from other agencies for collection of specific crop germplasm as also on the decision for specific explorations during various workshops and meetings. NBPGR stated (December 1994) that the number of explorations would come down in the coming years as a large part of germplasm had already been collected from different parts of the country.

9.1.8 Division of Germplasm Exchange

The division is responsible for carrying out introduction, exchange and distribution of plant genetic resources for research, documentation and dissemination of information on introduced plant genetic resources. The details of consignments imported and exported during 1989-94 by way of exchange of plant genetic resources were as under:

Year	No. of consign-ments imported	Total samples imported	No. of consign-ments exported	Total samples exported
1989-90	471	69380	198	3519
1990-91	298	60503	137	1633
1991-92	353	60017	151	2024
1992-93	383	74392	131	4530
1993-94	346	68520	100	1991
Total	1851	332812	717	13697

Imported samples comprised both import at the initiative of NBPGR and material obtained on request from scientists of research institutes/universities as well as

for international trials to be conducted in India. Exports were made on the basis of requests received by NBPGR/ICAR from institutes/agricultural universities in India and under various protocols, work plans or memoranda of understanding with different countries.

Feedback reports on the establishment, multiplication and evaluation of imported germplasm were not received in many cases from the indentors and it was not clear whether the samples served the purpose for which they were imported. NBPGR stated (December 1994) that efforts were being made to ensure that feedback was obtained from the indentors.

9.1.9 Division of Germplasm Evaluation

The division is responsible for preliminary evaluation, characterisation, maintenance, multiplication and identification of promising germplasm in agri-horticultural crops, their documentation and cataloguing as well as breeder's seed production of some of the released varieties and seed supply to user agencies. It was observed that the evaluation and maintenance of accessions had decreased in various stations during 1989-94. At New Delhi the accessions decreased from 20000 to 12000; at Amaravati from 3000 to 1500; at Jodhpur from 3268 to 1800; at Shimla from 4000 to 2000; at Bhowali from 5110 to 1473. It was further observed that Akola centre had evaluated and maintained 21000 accessions during 1992-93 but in the preceding and succeeding years, the evaluation and maintenance was of the order of only 12000 - 13000 per year. Thus the utilisation of resources did not appear to be optimum. NBPGR stated (December 1994) that the number of lines grown from year to year varies, depending on availability of materials and need

for multiplication. The steady declining trend in various stations was, however, not clarified.

Crop catalogues

Based on preliminary field and laboratory observation and characterisation, germplasm accessions are catalogued by the Division of Germplasm Evaluation to facilitate selection of material by the breeders. It was observed that from 1984 onwards, although more than 1000 accessions have been developed in each crop stored in the national gene bank, catalogues have not been prepared in respect of some of the important crops like wheat, paddy, brassica, peas, groundnut, finger millet, cluster millet, green gram, cotton, barley etc. NBPGR stated (December 1994) that while wide publicity is given to the promising accessions of different crops through publications and presentation of information during the workshops, seminars, symposia etc, detailed cataloguing is a pre-requisite for promoting utilisation of genetic resources and NBPGR would focus more on this aspect.

9.1.10 Division of Germplasm Conservation

The primary responsibility of this division is medium and long term conservation of seed of orthodox species of agri-horticultural crops and documentation of stored accessions to facilitate easy retrieval and utilisation. The total capacity of the national gene bank for long term conservation of plant genetic resources is approximately 200000 accessions. The base collection in the national gene bank was 129199 accessions as on 31 March 1994.

The year-wise accessions received for long term storage at the national gene bank for the period 1989-94 were as under:

Year	Year-wise accessions stored
1989-90	17493
1990-91	16973
1991-92	9670
1992-93	13559
1993-94	11140

The contribution from regional stations/base centres of NBPGR and from ICAR's institutes and universities etc showed a declining trend during 1989-94. NBPGR clarified (December 1994) that the materials sent for base collection are not accepted unless they meet certain strict quality standards and that is why the number accepted for storage may vary from year to year.

Medium term storage facilities were to be created at all institutions, including Agricultural Universities which had good collection of germplasm and where seed materials are to be maintained for a few years. No such facilities had been provided at the concerned institutions. Without storage facilities, the germplasm accession may lose their essential characters or viability as happened at the Directorate of Wheat Research, Karnal, where seeds of many accessions, when planted, did not germinate. NBPGR stated (December 1994) that efforts were being made to help some institutions to develop such facilities under the Indo-US PGR project. Other institutes and State Agricultural Universities were likely to develop such facilities on their own after learning from their experience of working with NBPGR.

9.1.11 Accounts

The statement of assets attached with the annual accounts of NBPGR did not include the book value of assets (land, buildings, equipment, vehicles etc.) held by NBPGR as on

April 1976 at the time of bifurcation from the Indian Agricultural Research Institute **(IARI)**. This also did not include the assets held by the Bhowali regional station transferred to NBPGR from IARI in 1986. The value of assets shown in the annual accounts could not be verified as the asset register was incomplete. NBPGR stated (December 1994) that efforts were being made to obtain the information relating to book value of these transferred assets.

No information regarding internal audit of regional stations and base centres was furnished to audit. NBPGR stated (December 1994) that due to paucity of trained staff, internal audit of regional stations and base centres could not be conducted but that efforts would be made to conduct internal audit of the regional stations and base centres. No internal inspection during the period under review was conducted by ICAR.

9.1.12 Other interesting points:

(i) NBPGR paid an advance of Rs 16.55 lakhs to CPWD in December 1989 for construction of 56 staff quarters. The work of construction of staff quarters had not been started so far for want of clearance of the layout plan from the Municipal Corporation of Delhi **(MCD)** and Delhi Development Authority **(DDA)**. NBPGR had also paid Rs 11 lakhs towards the cost of land to IARI during 1988-90. Rs 27.55 lakhs remained blocked for over five years. NBPGR stated (December 1994) that clearance had since been accorded by MCD/DDA but the notification and final official communication were awaited.

(ii) An amount of Rs 10.40 lakhs, paid to various officers of NBPGR between 1986-87 and 1993-94 for purchase of store items and for organising workshops etc, was pending adjustment till June 1994. The advances were

required to be adjusted within one month of the date of drawal. In many cases adhoc advances were being sanctioned without adjusting the earlier advances. NBPGR stated (December 1994) that all adhoc advances to staff upto 1992-93 had since been adjusted and a strict watch was being kept over such advances.

To sum up, the National Policy Planning and Review Committee on Plant Genetic Resources under the Chairmanship of Director General, ICAR, which was to decide on priority areas in national context did not meet since 1986. The quinquennial review team did not furnish the final report of the review conducted on the working of NBPGR for the period upto December 1990. Annual progress report of the research projects were not being sent to ICAR. Neither had any targets been set for the evaluation of germplasm accessions nor were records maintained for receipt of accessions for evaluation at Issapur farm. Funds received from IBPGR for seven projects had not been acccounted for. Equipments costing Rs 3.10 crores were not accounted for. Number of explorations fell short and feed back on the evaluation and multiplication of imported germplasm was not received in many cases. There was a steady decline in the number of accessions evaluated at various stations. Catalogues of some important crops like wheat, paddy, groundnut etc had not been prepared. Contribution from regional stations, base centres and other institutions to the national gene bank showed a declining trend. No facility had been created for medium term storage of germplasm in the concerned institutions. No internal inspection during the period under review was conducted by ICAR.

9.2 Blocking of funds

The Central Inland Capture Fisheries Research Institute **(CICFRI)**, Barrackpore approached the CPWD in November

1987 to prepare an architectural plan for construction of a building on the campus. In March 1990, CICFRI insisted on a preliminary estimate or a letter indicating the approximate amount required for construction to facilitate payment before the close of the financial year so as to prevent lapse of funds.

Pending finalisation of the preliminary estimate, CPWD intimated on the same day that the rough cost of the project would be about Rs 70.90 lakhs including departmental charges. On the basis of this rough estimate, CICFRI deposited Rs 15.73 lakhs with CPWD in April 1990.

CPWD sent a preliminary estimate for Rs 83.05 lakhs in May 1990 for administrative approval and expenditure sanction. The proposal was in deviation from the one submitted earlier. ICAR did not approve the advance action taken by CICFRI and desired that CPWD should be informed not to issue any work order for execution of this work. In February 1994, CPWD submitted a revised preliminary estimate for Rs 1.11 crores for which ICAR accorded administrative approval and expenditure sanction in March 1994.

Thus, unauthorised payment of Rs 15.73 lakhs to CPWD by the Institute did not even have the effect of accelerating the progress of the project besides blocking of funds without any resultant benefit.

The Council stated in November 1994 that Director CICFRI had been suitably advised not to deposit funds in advance in future without getting sanction from the Council.

9.3 Delay in installation of equipment

Between June and December 1990, the Central Research Institute for Jute and Allied Fibres (CRIJAF) Barrackpore, procured a walk-in cooler, a dehumidifier, a heat recovery system and seed dryers valued at Rs 8.66 lakhs for a gene bank to be set up under the Special Jute Development Programme. However, action for installing uninterrupted and stabilised appropriate power supply was initiated only in June 1993. The essential instruments required to be purchased for the gene bank were identified only in April 1994, but were still awaiting procurement action.

The Institute stated in June 1994 that the cooler-dehumidifier system had been installed. In the absence of the essential instruments, the equipment obtained in 1990 was not actually operational and the expenditure of Rs 8.66 lakhs has so far remained unfruitful.

The case was referred to the Council in October 1994; their reply is awaited (December 1994).

CHAPTER X

Council of Scientific and Industrial Research

(Department of Scientific and Industrial Research)

10.1 Central Fuel Research Institute

10.1.1 Introduction

The Central Fuel Research Institute **(CFRI)**, Dhanbad was established as a constituent unit of the Council of Scientific and Industrial Research **(CSIR)** in April 1950 to undertake research, both fundamental and applied, on India's fuel resources, specifically on coal and lignite, to assess their quality and their potential uses in the most efficient manner. The Institute is concerned with all activities for dissemination of knowledge and providing technical assistance on coal fuels to industries, Government and the public.

10.1.2 Scope of Audit

The Institute is audited under Section 20(1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The present review on the working of the Institute covers the period 1989-94.

10.1.3 Organisational set up

The Institute is headed by a Director and managed by a Research Council **(RC)** and a Management Council **(MC)**. External experts, representatives of Scientific Departments and agencies of Government of India and the Director of the Institute are members of RC. In addition to the RC and the MC, there is an Internal Management Committee **(IMC)** which is a broad based committee

comprising all Heads of Divisions and looks after all matters relating to research and administration of the Institute.

As on 31 March 1994, CFRI had 1073 personnel consisting of 866 scientific/technical and 207 non-technical personnel against the sanctioned strength of 1069 and 241 respectively.

10.1.4 Receipt and expenditure

The Institute is mainly financed through funds released by CSIR. The provision of funds and expenditure during the period 1989-94 is indicated below :-

(Rs in crores)

Year	Grants from CSIR	Receipts from other agencies and miscellaneous receipts	Revenue expenditure
1989-90	6.71	1.02	5.71
1990-91	6.45	1.00	6.09
1991-92	6.70	0.84	6.74
1992-93	8.24	1.13	7.85
1993-94	9.41	1.70	9.10

10.1.5 Research projects

Projects undertaken by the Institute fall into 4 categories i.e. in-house, grants-in-aid, sponsored and consultancy. In-house projects are wholly financed by the Institute. Grants-in-aid projects are partly funded by the Institute and partly by Government departments. Funds are provided by the sponsoring agencies for the sponsored projects and for consultancy projects, consultancy fee is realised from the concerned parties at rates prescribed by CSIR.

In-house projects

The position of in-house projects undertaken by the Institute during 1989-94 was as under :

	1989-90	1990-91	1991-92	1992-93	1993-94
Carried forward	15	4	9	13	10
Taken up	1	6	7	1	2
Completed	11	1	3	3	3
Kept in abeyance/ merged	1	-	-	1	2
On-going	4	9	13	10	7

There was time overrun of 3 to 36 months in 9 out of the 21 in-house projects completed during 1989-94.

The Council stated (December 1994) that only in one case was the time overrun three years mainly due to much larger number of samples required to be studied; in the remaining 8 cases, the time overrun was between 3 and 15 months due to various factors including redefinition and enlargment of the scope of work.

During the period 1989-94, the Institute spent Rs 2.19 crores on 25 projects including the projects kept in abeyance or merged with others. In 18 cases knowledge was generated and expertise/technology was developed in two cases but research findings of only 12 completed projects (cost Rs 1.43 crores) were utilised in the Institute or released to the industry. Out of 25 projects, there was no feedback from the industry or entrepreneurs in case of 13 projects (cost Rs 1.53 crores) nor were the results utilised in the Institute. Non-utilisation of these research findings were for one or more of the following reasons:

(i) there was lack of interest from the industry/entrepreneurs;

(ii) improved research findings had become available elsewhere for commercialisation; and

(iii) the research findings could not be scaled up further.

Sponsored projects

The position of the sponsored projects undertaken by the Institute during the period from 1989-90 to 1993-94 was as under :

Carried over from 1988-89	Taken up 1989-94	Completed 1989-94	Carried over to 1994-95
6	30	30	6

Except in one case, the Institue was not aware of the reaction of the sponsors to the research findings of the completed projects nor were the results utilised by the sponsors. The Council stated (December 1994) that lab's obligation ends after submitting the report and its acceptance by the sponsor and there is no way of knowing the reaction unless the sponsor further interacts with the laboratory. In the absence of any feedback, the usefulness of the end results could not be assessed.

Grants-in-aid projects

The position of the grants-in-aid projects pursued by the Institute during the years 1989-94 is indicated below :

Carried over from 1988-89	Undertaken during 1989-94	Completed during 1989-94	Kept in abeyance	Carried over to 1994-95
9	3	6	1	5

Of the 6 completed projects, the final reports/results had been submitted in 4 projects costing Rs 158.37 lakhs

(excluding salary component). The extent of usefulness of the findings to the end users and feedback were not available for three of these projects. In respect of the fourth one, the knowledge generated was intended to be used in the next phase of the programme. In one of the remaining two projects, completed at a cost of Rs 29.73 lakhs (exclusive of salary component), field trials were on and transfer of technology was under negotiation in respect of the other. Some of the completed projects are discussed below :

(i) A National Mission project on "Process Development for Conversion of Non-coking Coal/Lignite/Washery Middlings to a Coking Agent by Solvent Refined Coal **(SRC)** Technology" at an estimated cost of Rs 2.08 crores and funded by Mission Management Board **(MMB)** of the Ministry of Steel was taken up by the Institute in December 1988. The duration of the project was 4 years in two phases of two years each. The Ministry sanctioned Rs 2.08 crores (Rs 56.10 lakhs for phase-I including certain overlapping work of phase-II and Rs 151.40 lakhs for phase-II). Phase-I of the project was completed in January 1991 and the project report was submitted in May 1991. The project proposal for phase-II for Rs 5.35 crores was submitted in May 1991, and again a revised proposal for Rs 8.07 crores was submitted in June 1992 due to escalation in price of foreign equipment to be procured. Finally a modified proposal of Rs 3.75 crores was submitted in April 1993, under a new concept in which 95 **per cent** of the equipment to be used was to be indigenous. The sanction of the MMB for the revised second phase of the project has not yet been received and the second phase of the programme has not been started.

As phase-II of the programme was not approved, techno-economic feasibility study of the process developed in phase-I could not be carried out: The Institute stated (June 1994) that the efficiency of the project and the technical viability as established in phase-I study of the process are not sufficient to attract any entrepreneur. Only after successful completion of phase-II of the project, may the sponsoring authority utilise the expertise developed. In spite of pursuance by the Institute, phase-II of the project has not been approved by the funding agency though phase-I had been completed in June 1991. Thus, an expenditure of Rs 56.10 lakhs incurred on phase-I of the project did not yield any return so far. The Council stated (December 1994) that the Expert Committee constituted by the Scientific Advisory Committee **(SAC)** of the Ministry of Steel had agreed to provide the funds for phase-II.

(ii) To obtain increased availability of desired quality of coking coal for use in blast furnace coke making by developing improved beneficiation technology indigenously, the Mission Management Board of the Ministry of Steel sanctioned the project "Beneficiation of finely crushed coal by heavy medium cyclone-cum-oil agglomeration technique" in two phases and approved funding of Rs 22 lakhs for phase-I. The Institute took up phase-I of the project in December 1988 and completed it in November 1990. During this phase, a process was developed in bench scale for effective beneficiation of difficult to wash sub-standard coking coal. However, till June 1994, there was no information from the funding agency regarding the utilisation of the process. Expenditure of Rs 22.22 lakhs was incurred by the Institute on phase-I of the project. The proposal for phase-II of the programme was sent to MMB in August 1991. Approval of the Ministry was not received till June

1994. However, at the instance of the Institute, Department of Coal had agreed to the modernisation of the existing pilot plant and installation of a pilot plant having flexible washing circuits (in which "Heavy medium cyclone-cum-oil agglomeration" was included) for the beneficiation of difficult to wash sub-standard coking coal from Jharia coal fields and sanctioned an amount of Rs 4.78 crores for the purpose. The first instalment of Rs 50 lakhs was received by the Institute in March 1994. Thus, in this case there was absence of feed back on the process developed in the first phase of the project and delay in putting in further efforts necessary to make the process viable for commercial exploitation.

Similar was the position with the grants-in-aid project "Synthesis of olefin chemicals and selected fractions of hydrocarbons from synthesis gas". The project was taken up by the Institute in July 1985 and continued till June 1992. Expenditure of Rs 56 lakhs (exclusive of salary component) was incurred on the project and an active, selective and stable catalyst was developed for the synthesis of lower olefins in the laboratory scale. Further work on scale-up studies on the project which was required for commercialisation of the process could not be taken up so far for want of funds.

(iii) A grants-in-aid project "Design and installation of two coal fired inert gas generators for combating mine fire" of the Department of Coal with an estimated cost (excluding salary component) of Rs 10.37 lakhs (revised to Rs 22.30 lakhs) was taken up in August 1987. Phase-I of the project was to be carried out by CFRI and phase-II by Central Mining Research Stations **(CMRS)** and Bharat Coking Coal Ltd **(BCCL)**. The funding agency released Rs 20.30 lakhs during 1987-90 and remaining Rs 2 lakhs in August 1993. Instead of two units of gas generators only one was fabricated by January 1990. The funding

institution, Central Mine Planning and Design Institute Limited **(CMPDIL)** did not take delivery of the fabricated unit and insisted (June 1990) on the Institute's fabricating the other unit according to the original programme of work. The fabrication of the second unit was completed and demonstrated only in February 1994, four and a half years after the target date of completion. An expenditure of Rs 21.88 lakhs (except the salary component) was incurred on the project. Though the demonstration of both the units was successfully completed in February 1994, no action has been taken by the BCCL to dismantle, transport and re-instal the unit at the site (June 1994) in order to undertake the next phase of the project.

The time overrun of 4 years in completing the project could have been avoided, had the Institute fabricated both the units as per original programme of work for which funds had been allocated by the funding agency well in time. The Institute stated (June 1994) that it was difficult to calculate the consequential cost overrun on salaries as the staff members associated with this project were diverted to some other projects during the period.

Regarding fabrication of one unit instead of two, the Institute stated (August 1994) that work on one unit was taken up based on an informal understanding with CMPDIL and till the demonstration stage, CMPDIL had not insisted upon a second unit also being installed. The reply is not tenable as the project had been funded for fabrication of two units.

10.1.6 Monitoring and evaluation

As per directives issued by CSIR in May 1984, a Project Monitoring and Evaluation Cell (PMC) was required to be

constituted in each institution functioning under the Council of Scientific & Industrial Research (CSIR) for monitoring and evaluation of on-going projects at regular intervals. The Cell was required to submit a statement of progressive expenditure incurred on each project along with its physical progress to the Internal Committee for review. As stated by the Institute (June-July 1994), the Internal Committee was discontinued from September 1992 and in its place a broad based Internal Management Committee was formed in January 1993 to look after matters relating to research and administration of the Institute. Since then the Project Monitoring and Evaluation Cell is not discharging its earlier role. The Institute stated that the monitoring and evaluation of the on-going projects was being done and information was directly communicated to the project leaders for taking follow up action. No records showing monitoring and evaluation of projects and communication of suggestions to the project leaders were, however, made available to Audit. The Institue did not clarify the reasons for CSIR's instructions about PME Cell not being followed.

The Council stated (December 1994) that PMC continued as a part of technical information in the reorganised structure. Subsequently it became part of the Business Development Group, which was created to make the Institute more effective in terms of self-sufficiency.

10.1.7 Performance indicators

CSIR had identified a few performance indicators to evaluate the performance of any research institute. Based on those indicators (number of publications, patents etc.), the performance of the Institute for the last five years is indicated below :-

(Numbers)

	1989-90	1990-91	1991-92	1992-93	1993-94
Papers published	16	12	23	22	13
Papers published in Science Citation Index Journal out of above	8	3	5	4	0
Scientists available	321	304	346	314	295
Patents filed	7	4	3	4	5
Patents sealed/ Commercialised out of above.	Nil	Nil	Nil	Nil	Nil

(Average ratios: 68 scientists for each patent filed and 18 scientists for each paper published)

council stated (December 1994) that during 1989-94, 8 process know-how were released to 13 parties directly by the Institute and 2 patented processes were also released to 5 parties through National Research and Development Corporation. The Institute received royalty of Rs 7.47 lakhs on this account.

10.1.8 Stores

(i) Physical Verification

Physical verification of stores was last conducted in 1989.

(ii) Idle equipment

The Institute procured one JY-38 Plus Sequential Spectrometer for Rs 20.47 lakhs from France in April 1990, against the grants-in-aid project of the Department

of Coal on "Characterisation studies on coal and lignite ashes for promoting the rational utilisation of coal and lignite". After its installation in August 1991, certain problems developed in the system and the unit could not be operationalised. The defects could not be rectified by the agent/supplier till June 1994. This hampered the project work and the purpose for which the unit was purchased was defeated.

(iii) In order to provide infrastructure facilities, the Institute, in May 1988, procured one Nitrogen Liquifier with accessories for Rs 8.56 lakhs from USA The unit was installed only in February 1990 as the pre-installation facilities were not ready till then. The unit was hardly utilised upto August 1990 and thereafter the plant went out of order due to non-functioning of its chiller unit. Attempts were made to get it repaired through a local firm but without success. In June 1992, the Institute contacted the supplier, who stated that the local attempts to repair it had damaged the chiller and gave an estimate for Rs 0.51 lakh for its repair. Due to paucity of funds this could not be carried out and the plant worth Rs 8.56 lakhs procured in May 1988 remained practically unutilised till date (June 1994). Council stated (December 1994) that the Institute was making efforts to get the equipment repaired.

(iv) Three instruments worth Rs 10.05 lakhs were procured for the project "Beneficiation of finely crushed coal by heavy medium cyclone-cum-oil agglomeration technique" after completion of phase-I of the project in November 1990. Out of the above, one Surface Area Analyser worth Rs 4.06 lakhs was procured in July 1991 although a similar instrument was available in the Institute. The Institute stated (June 1994) that as the Analyser available in the Institute was heavily utilised, it was decided to procure one more instrument

for use in the aforesaid project. However, the new Analyser remained uninstalled till date (June 1994) as a few parts of the instrument were found to be defective. Council stated (December 1994) that efforts were being made to rectify and install the equipment.

10.1.9 To sum up, audit of CFRI revealed cases of delay in completion of projects and absence of feedback from the end users on the processes developed in the Institute. There was no systematic monitoring and evaluation of projects after September 1992. Equipments costing Rs 33 lakhs remained idle for periods ranging from 36 to 51 months for want of repairs.

10.2 Delay in installation of a fermentor

Regional Research Laboratory (RRL) Jorhat, placed an order in February 1990 on a foreign firm for supply of a Fermentor with Labo-controller and Air Pump at a cost of Rs 3.77 lakhs.

The equipment arrived at Calcutta Airport in July 1991 but was cleared only in February 1992, due to delay in completing customs formalities. The equipment could not be installed as some components were (February 1992) damaged/missing. RRL approached the supplier (May 1992) for replacement of the damaged parts and supply of the missing ones on "no charge basis", with a copy to the insurance company for treating it as provisional claim. However, RRL lodged an insurance claim of Rs 0.20 lakh only in July 1993. The claim was rejected on the ground that the insurance cover was only for a period of 30 days after discharge of the goods from the aircraft and there was no evidence that the damage occurred during the period of coverage, as the survey had been conducted late.

RRL placed a fresh purchase order with the supplier in January 1994, for supply of the damaged/missing parts and spent Rs 0.21 lakh on their procurement. Even after importing replacement parts for the damaged/missing parts in August 1994, the equipment worth Rs 3.77 lakhs had been lying uninstalled at RRL since February 1992. Thus an amount of Rs 3.77 lakhs has remained blocked for more than three years besides the avoidable expenditure of Rs 0.21 lakhs towards replacement of damaged/missing parts. The Council stated in November 1994 that replacement of damaged/missing parts had been received by the Laboratory and the matter had been taken up with the Indian agent to install the equipment.

10.3 Infructuous expenditure on acquisition of equipment

In March 1988, Central Salt & Marine Chemicals Research Institute **(CSMCRI)** Bhavnagar undertook a two-year research and development project in carbonylation of olefins by utilisation of syn-gas ($CO+H_2$), at an estimated cost of Rs 19.46 lakhs, including cost of equipments to be used during the progress of the project and for collection of data. Accordingly, CSMCRI imported two equipments at a cost of Rs 8.37 lakhs during January-March 1989.

Due to delay in completion of compressor room, the equipments could not be installed by February 1990 when the project was completed. These equipments were installed during May-August 1990 and since then these were lying idle.

Accepting the facts, CSMCRI stated in June 1994 that the basic research and the results achieved did not require

use of equipment. It was also stated that there was no approved programme requiring these equipments.

Thus, the equipment which were not required at all for the project were procured and the expenditure of Rs 8.37 lakhs remained infructuous.

Admitting the facts, the Council stated (January 1995) that the Institute was examining the possibility of gainful use of these items.

(U.BHATTACHARYA)
Principal Director of Audit
Scientific Departments

New Delhi
The 28 MAR 1995

Countersigned

(C.G.SOMIAH)
Comptroller and Auditor
General of India

New Delhi
The 29 MAR 1995

Appendix I

Grants paid to Autonomous Bodies

(Reference - Paragraph No. 1.1.11)

S. No.	Ministry/Department Name of Body	Amount of grants received in 1993-94
		(Rs in crores)
Department of Atomic Energy		
1.	Tata Memorial Centre, Bombay	26.40
2.	Saha Institute of Nuclear Physics, Calcutta	8.13
3.	Institute of Physics, Bhubaneswar	3.77
4.	Atomic Energy Education Society's School, Bombay	2.28
5.	Tata Institute of Fundamental Research, Bombay	45.68
	Total	86.26
Department of Electronics		
6.	Centre for Development of Advance Computing, Pune	7.78
7.	Society for Applied Microwave Electronics Eng. Research, Bombay	3.15
8.	Electronic Research and Development Centre, Calcutta	0.65
9.	National Centre for Software Technology, Bombay	0.58
10.	Centre for Electronics Design and Technology, Imphal	0.30
11.	Centre for Electronics Design and Technology, Aurangabad	0.10

12.	Centre for Electronics Design and Technology, Srinagar	2.40
13.	Software Technology Park, Bhubaneswar	0.18
	Total	15.14

Department of Environment, Forests and Wildlife

14.	Central Pollution Control Board, New Delhi	7.65
15.	Indian Institute of Forest Management, Bhopal	3.00
16.	Wild Life Institute of India, Dehradun	4.10
17.	Society for Promotion of Wasteland Development , New Delhi	Nil
18.	Central Zoo Authority of India, New Delhi	1.65
19.	Padmaja Naidu Himalayan Zoological Park, Darjeeling	0.06
	Total	16.46

Department of Science and Technology

20.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum	11.03
21.	National Institute of Immunology, New Delhi	7.53
22.	Raman Research Institute, Bangalore	5.45
23.	Bose Institute, Calcutta	4.24
24.	Indian Institute of Tropical Meteorology, Pune	3.00
25.	Indian Association for Cultivation of Science, Calcutta	4.50
26.	Indian Institute of Astrophysics, Bangalore	5.99

27.	Indian Institute of Geomagnetism, Bombay	2.52
28.	Indian National Science Academy, New Delhi	6.94
29.	Birbal Sahni Institute of Palaeobotany, Lucknow	2.17
30.	Wadia Institute of Himalayan Geology, Dehradun	2.43
31.	S.N.Bose National Centre for Basic Sciences, Calcutta	2.47
32.	Maharashtra Association for Cultivation of Science, Pune	1.93
33.	Indian Academy of Science, Bangalore	0.52
	Total	60.72

Department of Space

34.	National Remote Sensing Agency, Hyderabad	21.41
35.	Physical Research Laboratory, Ahmedabad	10.00
	Total	31.41

Department of Agriculture Research and Education

36.	Indian Council of Agricultural Research, New Delhi	423.75
	Total	423.75

Ministry of Health & Family Welfare

37.	Indian Council of Medical Research, New Delhi	53.54
	Total	53.54

Department of Scientific and Industrial Research

38.	Council for Scientific and Industrial Research, New Delhi	316.07
	Total	316.07

Department of Telecommunications

39.	Centre for Development of Telematics **(C-DOT)**	60.00
	Total	60.00
	Grand Total	1063.35

Appendix II

Outstanding Utilisation Certificates

(Reference - Paragraph No. 1.2)

Ministry/Department	Period to which grant relates	Number of utilisation certificates outstanding at the end of March 1993	Amount **(Rs in lakhs)**
Atomic Energy	1985-86	1	1.50
	1987-88	5	1.97
	1988-89	5	7.06
	1989-90	9	7.06
	1990-91	17	12.76
	1991-92	17	20.64
	1992-93	41	47.51
	Total	95	98.50
Environment and Forests	1980-81	25	33.90
	1981-82	85	48.31
	1982-83	92	165.75
	1983-84	256	271.53
	1984-85	257	428.18
	1985-86	286	799.07
	1986-87	274	1970.82
	1987-88	611	11683.53
	1988-89	594	3775.40
	1989-90	779	492.19
	1990-91	177	303.44
	1991-92	112	1748.64
	1992-93	297	3471.44
	Total	3845	25192.20

Non-Conventional Energy Sources	1983-84	153	214.99
	1984-85	240	535.36
	1985-86	372	752.73
	1986-87	347	673.85
	1987-88	528	1228.03
	1988-89	680	1258.39
	1989-90	643	1356.77
	1990-91	297	863.61
	1991-92	373	1298.26
	1992-93	165	1338.22
	Total	3798	9520.21
Ocean Development	1983-84	27	251.02
	1984-85	33	34.00
	1985-86	48	53.70
	1986-87	66	131.66
	1987-88	49	436.00
	1988-89	97	212.18
	1989-90	181	840.00
	1990-91	66	625.78
	1991-92	124	1724.03
	1992-93	24	68.92
	Total	715	4377.29
Space	1976-77	1	0.05
	1977-78	1	0.15
	1978-79	2	0.08
	1979-80	3	0.33
	1980-81	5	0.72
	1981-82	6	4.58
	1982-83	24	7.69
	1983-84	15	4.07
	1984-85	37	10.44
	1985-86	19	4.47
	1986-87	20	6.84
	1987-88	21	9.89
	1988-89	12	7.07
	1989-90	20	12.24

	1990-91	19	13.02
	1991-92	16	20.79
	1992-93	26	59.01
	Total	247	161.44
Science and Technology	1976-77 to 1980-81	696	1135.00
	1981-82	387	611.00
	1982-83	607	745.00
	1983-84	600	518.00
	1984-85	709	1353.00
	1985-86	911	1535.52
	1986-87	1416	2443.41
	1987-88	2179	3413.95
	1988-89	1708	4377.32
	1989-90	2439	5895.62
	1990-91	2505	9010.27
	1991-92	2750	13178.43
	1992-93	3124	16027.64
	Total	20031	60244.16
Geological survey of India Department of Mines	1991-92	5	0.45
	1992-93	4	0.30
	Total	9	0.75
Electronics	1979-80	58	113.71
	1980-81	75	142.39
	1981-82	110	155.03
	1982-83	40	72.22
	1983-84	87	243.34
	1984-85	126	939.16
	1985-86	86	578.24
	1986-87	89	858.65
	1987-88	98	2848.21
	1988-89	148	3883.36
	1989-90	262	5140.29
	1990-91	224	4832.21
	1991-92	277	6117.71

1992-93	308	4418.34
	1988	30342.86
Grand Total	30728	129937.41

Appendix III

Trends in re-appropriation of funds

(Ministry of Environment and Forests)

(Reference - Paragraph No 5.3)

Head	Year	Original grant	Final grant	Actuals	Reasons for excess or savings
(1)	(2)	(3)	(4)	(5)	(6)
			(Rs in lakhs)		
2406 B.1(3)(1) Survey and utilisation of Forest Resources	1989-90	280.00	234.38	249.12	Saving was due to less purchase and curtailment of non-essential tours due to economy instructions.
	1990-91	380.00	325.89	309.06	Saving was due to non-filling up of vacant posts.
	1991-92	348.00	256.53	257.67	Saving was due to economy measures and non-finalisation of puchases.
	1992-93	360.98	321.30	301.12	Saving was due to non-finalisation of contract agreement for cartography computer system.
B.3(1)(1)(2) Monitoring and Evaluation	1990-91	150.00	245.00	245.37	Excess was due to enlargement of scope of scheme.
	1991-92	200.00	100.00	98.91	Saving was due to non/late submission of proposals by implementing agencies.
	1992-93	150.00	52.00	51.49	
	1993-94	150.00	55.00	54.85	

B.3(1)(5) Fuel and Fodder Projects.	1992-93	10.00	-	-	Entire provision remained unutilised due to non/late submission of proposals by implenting agencies.
	1993-94	15.00		-	-do-
B.3(1)(1)(3) Margin Money Assistance Autonomous Bodies Corporations.	1990-91	290.00	65.00	65.01	Saving was due to non-clearance, sent for scrutiny by National Bank for Agriculture and Rural Development.
	1991-92	250.00	9.77	9.77	Saving was due to non/late submission of proposals by implementing agencies.
	1992-93	200.00	-	-	Entire provision remained unutilised due to non/late clearance of Plan schemes and delay in completion of administrative formalities.
B.3 (1)(6) Decentralised Nurseries	1989-90	300.00	62.00	62.00	Saving was due to less number of proposals from Voluntary agencies and autonomous Bodies.
	1990-91	100.00	70.61	63.50	Saving was due to less number of proposals approved for sanction.
B.1(2)(2) Indira Gandhi National Forest Academy.	1989-90	172.00	164.00	151.51	Saving was due to non filling up of vacant posts and curtailment of non-essential tours due to economy mea
	1990-91	246.00	144.80	107.88	Saving was due to economy measures and non-filling up of vacant posts.
	1991-92	245.00	161.45	146.50	Saving was due to non-engagement of casual workers, economy in tours etc.
	1992-93	201.00	209.00	208.06	

3435 C.3(4)(4) Field Action Programme Restoration of selected eco-system.	1989-90	22.00	14.50	17.41	Saving was due to less expenditure than anticipated.
	1990-91	25.00	18.36	18.90	Saving was due to less receipt of proposals from voluntary agencies.
C-4 (2) (7) National River Action Plan	1992-93	500.00	50.00	50.00	Saving was due to delay in obtaining the approval of competent authority.
C-4 (2) (3) Prevention and control of water	1989-90	640.00	739.00	733.53	Excess was due to more expenditure on account of the policy decision taken to make payment to the state pollution control Boards directly.
pollution (Cess)	1990-91	1340.00	637.55	630.48	Saving was due to less receipt of cess than anticipated owing to late process of cess cases by State Govts.
	1991-92	630.00	658.21	655.26	
C-4 (1) (1) Central	1989-90	6370.00	6006.72	5993.53	Saving was mainly due to economy measures.
Ganga	1990-91	7064.00	5184.15	5164.96	Saving was due to economy measures.
Authority	1991-92	6959.00	4974.92	4966.79	Saving was due to less demand received from the implementing agencies.
	1993-94	333.00	250.00	242.55	Saving was due to non-filling up of vacant posts ii) less number of proposals for grant-in-aid than anticipted iii) less expenditure on engagement of consultants than anticipated.
C-4 (1) (3) (1) (1) Externally	1992-93	500.00	----	----	Entire provision remained unutilised due to delay in obtaining the approval of Cabinet for rivers Yamuna and Gomti
Scheme	1993-94	1000.00	1595.80	1595.80	Excess was due to preparation of detailed project reports and acquisition of land for works.

C.5 (1) (7) Paryavaran Sudhar Vahini Clearance of plan scheme	1991-92	200.00	----	----	Entire provision remained unutilised due to revision of scheme.
	1992-93	200.00	16.90	16.85	Saving was due to non/late clearance of plan schemes.
	1993-94	380.00	30.00	27.25	Saving was due to non-launching of the scheme(s).
3601 D 1(1)(1)(1) Prevention of Pollution of River Ganga	1989-90	30.00	6.28	-	Saving was due to economy measures and less demand from the concerned States/Govt.
	1990-91	36.00	6.92	6.92	Saving was owing to less progress of various schemes implemented by State Govt.
	1991-92	41.00	5.00	4.24	Saving was due to less/no demand received from the concerned State Govt. and Boards etc.
	1992-93	35.00	6.88	6.88	Saving was due to less demand received from the implementing agenceis.
D. 1 (2) (1) Aerial Seeding	1991-92	90.00	160.00	160.00	Excess was due to more proposals received from the State Govts.
	1992-93	150.00	200.00	199.39	Excess was due to more proposals received from the State Govts.

Appendix IV

Savings/excess after re-appropriations. (Ministry of Environment and Forests)

(Reference - Paragraph No 5.3)

Head	Year	Original Grant	Final Grant	Actuals	Savings(-) Excess(+)
			(Rs in lakhs)		
2406 B.1 (2) (1) State Forest Service and Ranger's Colleges	1989-90	95.00	114.31	91.15	-23.16
B.3 (1)(1)(2) Monitoring & Evaluation.	-do-	30.00	75.33	104.68	+29.35
B.3 (1) (7) Integrated Wasteland Development Projects	-do-	200.00	137.00	90.82	-46.18
3435 C-Ecology & Environment C.1 (2) (3) Regional Offices	-do-	35.84	53.05	28.08	-24.97
C.3 (3) (1) Environmental Information system.	-do-	40.00	40.00	85.72	+45.72

C.5 (1) (2)- Environmental Policy and Law & Environmental protection Authority	1989-90	145.00	103.00	81.49	-21.51
3601					
D.2 (5) (1) Assistance for Development of National Parks	1989-90	215.00	156.00	189.46	+33.46
D 2(6)(4)(1) General Areas	1989-90	110.00	55.00	76.27	+21.27
3602					
E. 2 (3) (2) Assistance for Development of Sanctuaries.	1989-90	35.00	50.00	---	-50.00
E.2 (4) (1) Assistance for Development of National parks	--do--	35.00	25.00	---	-25.00
2406 B.1 (1) (1) (5) Institute of Wood Science and Technology	1990-91	98.50	84.50	62.34	-22.16
B.1 (2) (2) Indira Gandhi National Forest Academy	1990-91	246.00	144.80	107.88	-36.92
3435					
C.2 (1) (1) (Zoological C-2 (1) (1) Headquartens Office.	1990-91	100.42	105.89	80.72	-25.17

C.2 (3) (1) Headquarters Office	1990-91	344.18	281.20	211.45	-69.75
3435 C:Ecology Environment C:2 (3) (1) Headquarters Office.	1991-92	296.04	288.90	238.11	-50.79
C.4 (3) (1) Environmental Impact Assistance Programme.	1991-92	261.00	83.79	61.45	-22.34.

Appendix V

Trends in re-appropriation of funds

(Department of Space)

(Reference Paragraph No.8.1)

Head	Year	Original grant	Final grant	Actuals (Rs in lakhs)	Reason for excess or saving
3252	1991-92	3784	3077.82	3133.57	Delay in procurement of equipment
B.1(2)-INSAT-2	1992-93	5768	3409	3359.29	- do -
Satellite	1993-94	5515	4495	4348.74	Delay in delivery of equipments and non-materialisation of orders
3402					
C.2(1)(2)-ISRO	1991-92	204	229	229.88	Additional requirement for fabrication contracts
Inertial Systems	1992-93	113	271.50	272.14	- do -
Unit	1993-94	155	167	190.74	- do -
3402					
C.2(1)(4)-Polar	1991-92	1242	929	927.17	Reduced expenditure on fabrication/toolings
Satellite Launch					as per requirements
Vehicle (PSLV)	1992-93	631	542	543.85	Less requirement for materials and machinery
	1993-94	323	414	414.36	Spillover payments
3402					
C.2(1)(5)-Geo-	1991-92	6105	7391.93	7391.93	Additional requirement for contractual
Synchronous Launch					obligation
Vehicle (GSLV)	1992-93	11587	9446	9211.18	Poor response from foreign suppliers
Project	1993-94	14806	9282	9416.01	Delay and uncertainty for supply of material and delay in finalising fabrication contracts
3402					
C.2(1)(10)-INSAT-II	1991-92	4042	4924.35	4732.54	Spill over payments for machinery and
Test Spacecraft					equipment and payment of launch risk premium
Project	1992-93	934	3331	3245.02	Payment of insurance premium and requirement for equipment/material

	1993-94	2703	527	508.22	Preponement of payment of insurance charges to 1992-93
3402					
C.2(1)(11)-INSAT-II Launch Services	1991-92	1283	886.13	885.72	Non-exercise of "cash option" for launch contract
	1992-93	1044	410	484.34	- do -
	1993-94	150	45	45.20	- do -
3402					
C.2(1)(12)-Stretched Rohini Satellite	1991-92	124	23	22.72	Due to hold on SROSS 3 and 4 and delay in release of procurement orders
Series (SROSS)	1992-93	51	24	23.20	- do -
Continuation	1993-94	251	92	70.23	Delay in delivery of equipment
3402					
C.2(1)(17)-G-SAT	1991-92	50	NIL	NIL	Project not sanctioned
	1992-93	100	NIL	NIL	- do -
	1993-94	100	NIL	NIL	- do -
3402					
C.3(4)-National Natural Resources	1991-92	379	83.15	82.10	Transfer of expenditure on Central management to RRSSC and less requirement of support to states
Management System (NNRMS)	1992-93	244	469	467.51	Additional requirement for integrated mission sustainable development
	1993-94	371	128	124.89	Less requirement of support to states
5252					
AA.3.(1)-Indian National Satellite-1	1992-93	16	151	148.11	Payment of arbitration charges
	1993-94	20	145	133.04	Settlement of additional cost under contract
5252					
AA.3(2)-INSAT-2 Satellites	1991-92	1166	289	32.26	Non-finalisation of scope of civil works and slippage in delivery schedule of imported equipment
	1992-93	1074	321.71	318.97	Non-identification of additional works and delay in procurement of major equipments.
5252					
AA.4(1)-Indian National Satellite-I	1992-93	35	17	16.32	Non-utilisation of provision for civil works
	1993-94	84	126.58	108.12	Procurement of computer system

5402					
BB.2(1)(1)-Vikram Sarabhai Space Centre	1991-92	232.40	635	634.82	Unplanned spill over payments, essential facility augmentation.
	1992-93	732.10	411	411.01	Provision made for computers not utilised
	1993-94	154.10	994	996.32	
5402					
BB.2(1)(5)-Geo-Synchronous Launch Vehicle (GSLV) Project	1991-92	4174	553.08	546.82	Surrender of Rs 35.70 lakhs due to conscious approach in procurement action
	1992-93	3613	4350.42	4324.88	Procurement of long lead items of equipment
	1993-94	5920	4695.97	4691.47	Works at Mahendragiri not taken up
5402	1991-92	147	244.92	188.75	Replacement of data acquisition system and procurement computer system
BB.2(1)(6)-Liquid Propulsion Systems	1992-93	235	207.80	206.76	Non-utilisation of provision made for housing
(LPS) Centre	1993-94	184	309.66	245.22	Additional requirement for construction of Ground Level Reservoir at Bangalore
5402					
BB.2(1)(7)-ISRO	1991-92	440	583.12	274.69	Delay in construction work
Satellite Centre	1992-93	300.20	576.28	574.29	Progress of civil works and spillover payments for machinery
	1993-94	287.65	569.78	541.50	Augmentation of facilities for Laboratory for Earth Science observation systems
5402					
BB.2(2)(2)-	1991-92	320.20	103.22	101.66	Less requirement for augmentation of building
Sriharikota Centre	1992-93	63.10	172.68	173.31	Sanction of new works
	1993-94	75.40	194.82	168.34	Accelerated progress of work and unplanned spillover payments
5402					
BB.2(2)(3)-ISRO	1991-92	463	113.60	106.96	Re-location of facilities
Telemetry, Tracking and Telecommand Network (ISTRAC)	1993-94	320	247.13	247.18	Non-completion of works

5402					
BB.2(3)(2)-Sriharikota Centre	1991-92	273.30	247.79	246.35	Less requirement for construction of administrative building
	1992-93	120.40	390.47	387.04	Payment of establishment charges towards land acquisition
	1993-94	351.50	153.27	151.70	Deferment of payment of compensation
5402					
BB.3(1)(1)-Space Application Centre	1991-92	169.60	125.77	125.74	Non-utilisation of token provision for land
	1992-93	0.90	108.75	107.32	Procurement of computer systems
	1993-94	159.30	192.63	219.97	Additional requirement for extension of building
5402					
BB.3(4)-Regional Remote Sensing Service Centres (RRSSC)	1991-92	197	102.07	101.72	Restricting expenditure to essential items of equipments
	1992-93	140	149.30	151.80	Unplanned spillover payments
	1993-94	175	683.04	547.17	Additional requirement for procurement of computer systems

Appendix VI

Savings/excess after re-appropriations
(Department of Space)

(Reference Paragraph No.8.1)

Head	Year	Original grant	Final grant	Actuals	Savings(-) Excess (+)
			(Rs in lakhs)		
3451 - A-Secretariat	1991-92	110	127	119.96	(-) 7.04
A.1(1)-Department of Space					
3402 - C. Space Research					
C.2(1)(11)-INSAT-II Test Spacecraft Project	1991-92	4042	4924.35	4732.54	(-) 191.81
3402 - C.4-Space Sciences					
C.4(3)-ISRO-Geosphere Biosphere Programme	1991-92	130	124	110.88	(-) 13.12
C.4(4)-MST Radar	1991-92	150	129.20	117.16	(-) 12.04
3402 - C.5-Common Services					
C.5(1)-Civil Engineering Division	1991-92	337	382	350.31	(-) 31.69
5252 - AA.Capital Outlay on Satellite Systems					
AA.3(2)-INSAT-2 Satellites	1991-92	1166	289	32.26	(-) 256.74
5402 - BB.2-Space Technology					
BB.2(1)(7)-Liquid Propulsion Systems (LPS) Centre	1991-92	147	244.92	188.75	(-) 56.17
5402 - BB.2-Space Technology	1991-92	440	583.12	274.69	(-) 308.43
BB.2(1)(8)-ISRO Satellite Centre	1991-92	191	106.52	202.85	(+) 96.33
BB.2(1)(10)-INSAT-II-Test Spacecraft Project					
BB.2(1)(12)-IRS Continuation Project	1991-92	1171	1093.75	853.17	(-) 240.58
5402 - BB.2(2)-Facilities					
BB.2(2)(3)-ISRO Telemetry, Tracking and Telecommand Network (ISTRAC)	1991-92	463	113.60	106.96	(-) 6.64

3252 - B-Satellite Systems						
B.1(2)-INSAT-2 Satellite	1992-93	5768	3409	3359.29	(-)	49.71
3402 - C.Space Research						
C.2(1)(6)-Geo synchronous Launch Vehicle (GSLV) Project	1992-93	11587	9446	9211.18	(-)	234.82
C.2(1)(7)-Liquid Propulsion System (LPS) Centre	1992-93	1318	1449	1440.20	(-)	8.80
3402 - C.Space Research						
C.2(1)(11)-INSAT-II-Test Spacecraft Project	1992-93	934	3331	3245.02	(-)	85.98
C.2(1)(12)-INSAT-II Launch Services	1992-93	1044	410	484.34	(+)	74.34
3402 - C.2(3)-Ancillaries						
C.2(3)(2)-Sriharikota Centre	1992-93	1121.70	1346	1333.48	(-)	12.52
3402 - C.3-Space Applications						
C.3(1)(1)-Space Application Centre	1992-93	1336.40	1408.14	1378.24	(-)	29.90
C.3(1)(2)-Development & Educational Communication Unit (DECU)	1992-93	282	376	367.73	(-)	8.27
3402 - C.4(5)-Other Schemes	1992-93	227.35	172.42	160.60	(-)	11.82
3402 - C.5-Common Services						
C.5(1)-Civil Engineering Division	1992-93	400	430	416.19	(-)	13.81
5402 - Capital Outlay on Space Research						
BB.2 Space Technology	1992-93	3613	4350.42	4324.88	(-)	25.54
BB.2(1)(5)-Geo Synchronous Launch Vehicle (GSLV) Project						
5402 - BB.2-Space Technology	1992-93	538	494.88	453.66	(-)	41.22
BB.2(1)(11)-IRS Continuation Project						
3451 - A.Secretariat						
A.1(1) Department of Space	1993-94	157	178	160.65	(-)	17.35
3252 - B.Satellite Systems						
B.1(1)-Master Control Facility	1993-94	474	549	538.09	(-)	10.91
B.1(2)-INSAT-2-Satellite	1993-94	5515	4495	4348.74	(-)	146.26
B.1(3)-INSAT-2-Launch Services	1993-94	15000	15950	15809.28	(-)	140.72

3402 - C.Space Research						
C.2(1)(2)-ISRO Inertial System Unit	1993-94	155	167	190.74	(+)	23.74
C.2(1)(5)-Geo Synchronous Launch Vehicle (GSLV) Project	1993-94	14806	9282	9416.01	(+)	134.01
C.2(1)(9)-Indian Remote Sensing Satellite (IRS) Project	1993-94	247	196	185.83	(-)	10.17
3402 - C.Space Research						
C.2(1)(10)-INSAT-2 Test Spacecraft Project	1993-94	2703	527	508.22	(-)	18.78
C.2(1)(12)-Stretched Rohini Satellite Series (SROSS) Continuation	1993-94	251	92	70.23	(-)	21.77
3402 - C.2(2)-Facilities	1993-94	953.79	1138.50	1121.75	(-)	16.75
C.2(2)(2)-Sriharikota Centre						
3402 - C.2(3)-Ancillaries						
C.2(3)(2)-Sriharikota Centre	1993-94	1303.21	1583.50	1562.67	(-)	20.83
C.3(5)-Regional Remote Sensing Service Centres (RRSSC)	1993-94	166	182	172.29	(-)	9.71
C.4(3)-ISRO-Geosphere Biosphere Programme	1993-94	100	84	74.86	(-)	9.14
C.5(1)-Civil Engineering Division	1993-94	460	527	492.18	(-)	34.82
C.7(2)-Special Indigenisation	1993-94	450	2562	2442.87	(-)	119.13
5252 - Capital Outlay on Satellite Systems						
AA.3-Spacecrafts						
AA.3(1)Indian National Satellite-I	1993-94	20	145	133.04	(-)	11.96
AA.3(2)-INSAT-2 Satellites	1993-94	426	436.11	418.52	(-)	17.59
AA.4(1)-Indian National Satellite-I	1993-94	84	126.58	108.12	(-)	18.46
5402 - BB.Capital Outlay on Space Research						
BB.1-Machinery & Equipment						
BB.1(1)-Vikram Sarabhai Space Centre	1993-94	8.90	3.30	16.55	(+)	13.25
5402 - BB.2-Space Technology						
BB.2(1)(6)-Liquid Propulsion Systems (LPS) Centre	1993-94	184	309.66	245.22	(-)	64.44
BB.2(1)(7)-ISRO Satellite Centre	1993-94	287.65	569.78	541.50	(-)	28.28
BB.2(1)(10)-IRS Continuation Project	1993-94	256	344.53	236.97	(-)	107.56

5402 - BB(2)-Facilities						
BB.2(2)(2)-Sriharikota Centre	1993-94	75.40	194.82	168.34	(-)	26.48
5402 - BB.3-Space Applications						
BB.3(1)(1)-Space Application Centre	1993-94	159.30	192.63	219.97	(+)	27.34
BB.3(4)-Regional Remote Sensing Service Centres (RRSSC)	1993-94	175	683.04	547.17	(-)	135.87