REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

FOR THE YEAR ENDED 31 MARCH 1990

NO. 2 OF 1991

UNION GOVERNMENT
(SCIENTIFIC DEPARTMENTS)

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1. Administrative Module (AM)

Administrative module is a common module of the system in the larger Main Automatic Exchange (MAX) systems. Centralised functions like routing in large exchange systems is done at Administrative Module (AM) which is a single frame situated in the same cabinet as the Central Module (CM).

2. Advanced Integrated Manufacturing Systems (AIMS)

This is a package usable in manufacturing companies involved in the manufacture of electronic systems.

3. Base Module (BM)

The base module is the basic building block of the large MAX switching system. The base module can terminate upto 512 lines/trunks in a non-connectivity mode and upto 2000 lines in a concentrating mode. The BM handles most of the call handling related functions.

4. Busy Hour Call Attempts (BHCA)

BHCA is the number of call attempts made during the busy hour. The busy hour refers to the traffic volume or number of call attempts in the continuous one hour period lying wholly in the time interval concerned for which this quantity (i.e. traffic volume or call attempts) is the greatest.

5. Centrifuge

Centrifuge is a device in which solid or liquid particles of different densities are separated by rotating them in tube in a horizontal circle.

6. Chromatograph

Chromatograph is a machine used for analysing or separating mixures of gases, liquid etc.

7. Computer Inter-working

With high level of computerisation, there is a growing need for the computers located at geographically distant locations to share data, facilities and computing power in accomplishing common goals. All these computers are said to interwork to complete a task. Computer interworking will need an efficient data communication mechanism for sending and receiving data between the machines.

8. Central Module (CM)

This is the module which does the function of interconnecting the Base Modules in the large C-DOT DSS. The CM is required in systems above 1500 lines. The CM also does some of the centralised functions like central path establishment in the larger C-DOT MAX switches.

9. 24 Cell Scheme

It is a power supply arrangement using 24 battery cells for the exchange.

10. Committee Consultative International Telephone And Telegraph(CCITT) NO.7

This is the latest set of recommendations from CCITT on the common channel signalling between telephone exchanges. The CCITT is the international body under United Nations for all the communications related standards. CCITT No.7 is an intelligent form of computer communication (signalling scheme) providing great flexibility in order to realise advance communication features and achieve efficient network administration and management.

11. CHILL

CHILL is a high level language for programming stored programme control telephone exchanges, developed by CCITT. CHILL is a language which falls into the class of strongly typed and concurrent languages.

12. 'C' Language

This is a popular language, which is also part of UNIX environment. Some of the modern switches are designed using 'C' language. 'C' language is considered to be suitable for system programming and for writing efficient programmes.

13. Compiler

This is a software programme which translates programmes written in high level language into machine executable form.

14. Component Approval Centre for Telecommunications (CACT)

This is a test centre for Department of Telecommunications where various types of components are tested for their performance. Causes of component failure are also analysed. This centre is located at Bangalore.

15. Digital Switching System (DSS)

DSS is the telephone exchange system employing stored programme control and digital technology. DSS provides a full digital telecommunication capability. Analog signals are normally converted into a digital form as the input of DSS. Modern switching systems are generally digital and DSS is the basic framework on which integrated services digital network can be built. Therefore, a DSS can be described as "a switching system that switches information in digital form through its switching devices".

16. E10B Technology

E10B is the digital switching system technology acquired from the French multi-national company CIT-ALCATAL. This is one of the earliest digital switching technology. E10B is manufactured by Indian Telephone Industries at the ESS-1 factory at Mankapur.

17. Heavy Water

Heavy Water is water in which Hydrogen atoms H are replaced by the heavier isotope Deuterium. Its physical properties differ from those of normal water.

18. Input Output Processor (IOP)

The IOP is the front end processor which gives accessibility for the exchange operators. Commands controlling the system can be given from the IOP and the system messages are displayed or printed by the IOP.

19. Integrated Service Digital Network (ISDN)

ISDN is an integrated digital network in which the same digital switches and digital paths are used to establish connections for different services, for example, telephony, data.

20. Laser

Laser is a device generating intense beam highly coherent monochromatic radiation in one direction by stimulation of emission excited atoms (optical maser).

21. Magneto Hydro Dynamics (MHD)

MHD is the study of the interactions between a conducting fluid and a magnetic field. It is a system of direct conversion of heat into electricity

22. Microdensitometer

It is an instrument measuring accurately small diameters, thickness etc.

23. Modular Systems

Compiled systems are normally designed to be "modular". Modularity helps reduce the complexity of large systems by helping to realise them as a member of smaller sub-systems. The smaller sub-systems by themselves can be modular and can be made up of still smaller systems.

24. Oncology

Oncology is study of tumours.

25 Operational Requirement(OR)/Qualitative Requirement (QR)

This is a document which brings out the specifications laid out by the customer before the design of a

product is undertaken. It brings out the issues involving the operational environment of the system and spells out the behaviour of the system under such environment. It also specifies the quality requirement to be met by the system during its regular service life under the defined environment.

26. Plasma

Plasma is a highly ionised gas in which the number of free electrons is approximately equal to the number of positive ions.

27. Parallel Computing System

This is a new computer architecture which is suitable for solving highly intensive computational jobs. Parallel computing system evolves the principle of using a number of computing elements in parallel in solving problems. Problems like the weather forecasting etc. present themselves to be made into parallely computable tasks. Till recently high power computing systems were not available for import into India. Parallel computing system may provide an answer for this problem.

28. 16 PE System

It refers to 'Parallel Computing System'. A 16PE system is a parallel processing system with 16 processing elements.

29. 64 PE System

It is a parallel processing system with 64 processing elements.

30. 128 PE System

It is a parallel processing system with 128 processing elements.

31. 128 port PABX (Private Auxiliary Branch Exchange)

This is another spin-off product of the MAX family of switches. It is similar to the 128 port Rural Automatic Exchange (RAX). But, it supports a different set of features and is meant for the office environment. 128 port PABX also essentially consists of the terminal unit hardware of the MAX switches.

32. 512 port MAX

The smallest product in the MAX (Main Automatic Exchange) family is called 512 port MAX. This can terminate 512 lines/trunks in a non-concentrated mode. However, with concentration, this switch can terminate more than 1500 subscriber lines.

33. 4000 port MAX

It is a switching system which can terminate upto 4000 circuit (lines plus trunks).

34. 16000 port MAX

It is a switching system which can terminate upto 16000 circuits (lines plus trunks).

35. 128 port RAX

This is the smallest member of C-DOT switching system family. 128 port RAX essentially consists of the terminal unit hardware which goes into the larger MAX family of switches.

36. Remote Switching Unit

It is a switching unit associated with and controlled by an exchange in a different location.

37. Silvi

Silvi is growing and tending of trees as branch of forest.

38. Space Switch Controller (SSC)

The space switch controller is a Motorola 68,000 based processor which is responsible for path establishment at the central module. Some of the centralised system maintenance functions also reside in the SSC.

39. Teletex

It is a telematic service enabling subscribers to exchange correspondence via telecommunication networks.

40. Televideo System

This is a family of personal computing systems manufactured by the Televideo Corporation, USA.

41. Trunk Automatic Exchange (TAX)

TAX is an exchange which is used as switching point for traffic between different cities/towns in the national network.

42. UV-Radiation

UV-Radiation means electromegnetic rediation having certain wave lengths.

PREFATORY REMARKS

This Report for the year ended 31 March 1990 has been prepared for submission to the President under Article 151 of the Constitution. It relates mainly to matters arising from test audit of the financial transactions of the Scientific Departments of the Union Government and the Autonomous Bodies under these Departments.

2. This Report includes, among others, reviews on

(a) National Wastelands Development Board

(b) National Dairy Research Institute, Karnal

(c) Centre for Development of Telematics

(d) Central Drug Research Institute, Lucknow

3. The cases mentioned in this Report are those which came to notice in the course of audit during the year 1989-90 as well as those which came to notice in earlier years but could not be dealt with in previous Reports. Matters relating to the period subsequent to 1989-90 have also been included wherever considered necessary.

This Audit Report for the year ended 31 March 1990 contains 44 paragraphs including four reviews. The points highlighted in the Report are given below:-

Ministry of Agriculture

I. National Dairy Research Institute, Karnal

National Dairy Research Institute, Karnal, a constituent unit of the Indian Council of Agricultural Research, was conferred the status of 'Deemed University' under the University Grants Commission Act, 1956. It conducts basic and applied research in all branches of dairy science and technology connected with milk production, breed improvement and milk processing.

During 1985-90, non-plan expenditure exceeded budget provision by Rs.358.96 lakhs and there was under utilisation of plan funds to the extent of Rs.43.64 lakhs indicating inadequate budgetary control.

Staff Research Council which is responsible for monitoring the progress of research activities and giving clearance to continuance of ongoing research projects and undertaking new ones met only once in a year resulting in inadequate monitoring of research projects and utilisation of research facilities.

Scientists who joined the Institute after the annual meeting of the Staff Research Council, or whose projects were completed after the meeting, could not be assigned any research project till the next meeting, which was held after one year. In 1988, no fresh project was approved and many scientists could not be assigned any project resulting in under utilisation of scientific manpower. Seventy one scientists were not engaged on any research project for periods ranging from 6 months to 3 years.

Fourteen research projects involving 37 scientists were prematurely terminated, due to transfer, deputation, resignation or retirement of scientific personnel and lack of finance rendering the expenditure of Rs.26.99 lakhs infructuous.

Inspite of declining response there was an 'effort to discourage farmers from other States' for the training programmes organised at the Krishi Vigyan Kendra of the Institute.

Model dairy demonstration units proposed by the Krishi Vigyan Kendra, for adoption by villages, were not proving economically viable.

'Lab to land' programme for transfer of technology was discontinued due to shortage of funds eventhough it had a definite impact, resulting in denial of research benefits to the society.

There was under-utilisation of the experimental dairy plant even after procuring milk from outside and the purpose of earning profit for the 'Revolving fund' was not likely to be achieved.

Inadequate monitoring of the work of production and maintenance workshop caused difficulty in commercialisation of the equipment designed and developed.

(Paragraph 19)

II. Indian Institute of Horticultural Research, Bangalore

There was delay of over five years in commissioning a cold storage plant built at a cost of over Rs.20 lakhs.

(Paragraph 20)

Ministry of Communications

III. Centre for Development of Telematics

Centre for Development of Telematics (C-DOT) was set up in August 1984 as a national centre for research and development of a new generation of digital switching system. Based on the new technology, to be developed by C-DOT within three years, a new switching factory was proposed to be established. Initially, development of a 40,000 line exchange with provision for eight lakh Busy Hour Call Attempts (BHCA) was envisaged which was scaled down to 20,000 lines in November 1984, as designing a system of 40,000 lines was considered a 'really difficult and ambitious task'. C-DOT planned (March 1985) for 16,000 lines at 2.60 lakh BHCA. The field trial was to be conducted by August 1987 and productionisation stablised in another 2 to 2 1/2 years, i.e, within the Seventh Plan period. In May 1988, it was realised that the theoretical overall capacity of the system could be expected to be around 1.80 lakh BHCA only.

Against the objective of 16,000 lines exchange by August 1987, C-DOT could commission a 512-port ex-

change with 345 lines in Delhi in August 1988. Another exchange with 800 lines was commissioned in August 1989 at Ulsoor (Bangalore) which was upgraded to 2,400 lines in October 1989. Neither of the two exchanges have got technical clearance of the Department of Telecommunications (January 1991). The basic product of C-DOT was still under trial. The proto-type built by C-DOT would cater to exchanges upto 5,000 lines.

About 1.68 lakh lines were to be met by C-DOT type exchange equipment (128-port and 512-port) during 1988-89 and 1989-90 as stated by Department of Telecommunications. In 1988-89, 400 RAX were to be installed under RAX-A-DAY programme. Only 180 units of 128-port RAX (about 15,800 lines) were commissioned till end of March 1990.

Objectives of C-DOT included development of a Trunk Automatic Exchange and undertaking R&D work for introduction of Integrated Services Digital Network (ISDN) which would be the main vehicle for future ISDN services. But, no work had been undertaken so far in this direction (January 1991).

C-DOT was to develop its technology in a high level language known as 'CHILL'. C-DOT entered into an agreement with Tata Research and Design Development Centre in April 1987 to develop software for 'CHILL' after which the technology developed in 'C' language would be converted to CHILL. The software was yet to be demonstrated.

C-DOT took up, in March 1988, a project "Parallel Computing System" sponsored by Department of Science and Technology for Rs.4.00 crores for completion by September 1989. An amount of Rs.1.95 crores had been spent by C-DOT till March 1990 on the incomplete project.

C-DOT engaged 13 consultants; one on monthly retainer basis and others on hourly basis. Out of the total expenditure of Rs.189 lakhs on consultants upto March 1989, Rs.89 lakhs accounted for fee, reimbursement of income-tax, travel expenses and hotel charges of the USA-based full time consultant. He was required to submit monthly reports on work done by him. He did not submit any monthly report nor did C-DOT keep any record of his achievements against the milestones as desired by the Steering Committee/Governing Council.

With the objective of using indigenous components as already available in the design and further indigenous development for replacement of imported components, C-DOT had launched Vendor. Development Programme. The components used in C-DOT's products could be used in other electronic items as well thereby giving a boost to the electronic industry.

C-DOT had embarked upon independent systems of 128-port and 256- port PABX, 128-port RAX, 512-port MAX for transfer of technology for bulk producion by the licensees. No system had been evolved to assess the cost involved in development of each product. The details of staff deployed on each product and other inputs were not being kept and the technology transfer fee and royalty were fixed on ad-hoc basis.None of the products had been patented.

C-DOT had adopted the system of Project Evaluation and Review Technique (PERT) to monitor its project activities. No attention was being paid towards achievement of targets as laid down in the PERT charts nor were the reasons for delay/failure to achieve the objectives analysed for corrective measures and towards reallocation of resources. Department of Telecommunications stated that due care would be taken by C-DOT while monitoring in future.

Procedures had been laid down to allot activities to individuals and monitor their progress. The stipulated documentation was not maintained properly. Department of Telecommunications stated that modified schedules for various programmes were being worked out and these were proposed to be monitored closely.

The Governing Council of C-DOT, which was to meet at least once in a year met 13 times in the six years upto July 1989. There were shortfalls, from the prescribed periodicity, in the number of meetings of the Steering Committee and the Project Board. Department of Telecommunications mentioned that the Project Board often met informally; however, in future more attention would be given to formal monitoring.

C-DOT's purchase procedures were flexible but even these were not adhered to. While indenting for an equipment or components, indentors neither mentioned the purpose of the indent nor indicated the reasons for asking for a particular make. Materials were generally purchased on single quotation basis without proprietary article certificates. Proper record of receipt of stores as regards quantity and good condition was not maintained. Department of Telecommunications stated that instructions were being issued to ensure that requirements of purchase procedure were complied with.

Stores accounts had not been maintained properly. Prior to April 1990, no system had been developed to ascertain the total issues and receipts of individual items. Physical verification of stores and assets served no purpose as C-DOT was not working out the closing balances as per Stores Accounts with which the actual available stores/assets could be compared. Department of Telecommunications stated that the question of streamlining store accounting was under review.

C-DOT had created a reservoir of young (average age about 30 years) and talented scientists for research and development acitivities in the field of digital switching system. There was high level of motivation and enthusiasm among the scientists and other staff. Added to these were increased use of personal computers, less of file and paper work etc. However, the staff position ratio of non-technical staff when compared with technical staff had been gradually increasing.

C-DOT was to fulfill its mandate in three years at a cost of Rs.35 crores. C-DOT was allowed to adopt liberalised rules and procedures to preempt hindrances to the time-bound programme. An extension by three years with additional outlay of Rs.32 crores was granted. After six years of its existence, C-DOT had not achieved the mandate, set out for the first three years, though procedures were liberalised and there was no problem of funds and foreign exchange.

Department of Telecommunications stated, in March 1991, that the task undertaken by C-DOT was to design, develop and productionise a sophisticated digital electronic switch with a specification of 40,000 lines capacity to handle 20 BHCA per line. They further said that even systems of lower capacity are known to have taken as long as six years even though fully established R&D facilities have been in full-scale operation. As against this, C-DOT had started from scratch and set up an organisation of highly motivated young engineers to undertake the developmental activities. According to the Department, there are only 8 to 10 organisations in the world who have successfully developed digital switch technology on their own.

The Department added that all efforts were being made to remove the lacunae pointed out in the audit. It further stated that the modular approach adopted by C-DOT and progressive product development would result in bridging the shortage of switching equipment in the range of 500 to 10,000 lines in a quicker and more cost effective manner. On a conservative basis, these products will cover 50 per cent of the requirements in the country.

(Paragraph 23)

Ministry of Energy

IV. Infructuous spending of foreign loan

Foreign loan repayable in foreign exchange to the tune of Rs.20.68 crores was obtained and a total expenditure of Rs.24.71 crores incurred, by Department of Non-Conventional Energy Sources, for installing an imported garbage incineration plant in Delhi without detailed reliable analysis of the quality of garbage which was to be the raw material for the plant. The raw material was subsequently found unfit for the plant resulting in winding up of the project and rendering the entire expenditure infructuous.

(Paragraph 2)

V. Magneto Hydro Dynamics Research Project

Department of Non-Conventional Energy Sources took up a research and development project for creating indigenous capability for economic generation of power using coal as the fuel. Reasons for selecting coal as the fuel were its abundance in the country and the fact that the technology once mastered with coal could subsequently be developed with natural gas but the reverse would not naturally follow. The project had still to realise its objectives after 13 years of its inception and incurring an expenditure of Rs.26 crores. Test runs have been carried out with liquified petroleum gas even though the fuel option had been foreclosed in 1976.

(Paragraph 4)

VI. Release of grants-in-aid

Department of Non-Conventional Energy Sources sanctioned the proposal of Punjab Agro Industries Corporation for installation of a 1.5 MW power generation plant at a total outlay of Rs.2.9 crores (50 per cent share to be borne by the Department) and released an amount of Rs.1.00 crore without proper appraisal of the project. As a result, an amount of Rs.1.00 crore had been lying unutilised with the Government of Punjab for nearly three years besides wasteful expenditure of Rs.10 lakhs.

(Paragraph 4)

VII. Windmill demonstration project

Department of Non-Conventional Energy Sources had undertaken the Wind Pump Demonstration Programme in Andhra Pradesh at a cost of Rs.23.59 lakhs, to obtain a more extensive user response, to create awareness in newer areas and to provide inputs for a subsequent extension programme. Against the sanction of 150 wind mills, 73 were not procured and

out of the 77 procured only 29 were reportedly in working order rendering the money spent (Rs. 7.49 lakhs) on the remaining 48 as unproductive. Due to large scale failure of these windmills user response would have been adversely affected.

(Paragraph 5)

Ministry of Environment and Forests

VIII. National Wastelands Development Board

To control the expansion of wastelands and regenerate existing lands being subject to degradation, National Wastelands Development Board was constituted in 1985. The main aim of the Board was to launch a massive programme of afforestation by securing people's participation. It was also to monitor all afforestation efforts of various governmental and non-governmental agencies and formulate and fund some schemes in furtherence of its own objectives.

The Board had undertaken the National Wastelands Identification Project for a comprehensive identification and categorisation of various degraded land units in the country and development of data base on related aspects of afforestation. The Board has not yet developed a data base on related aspects of wastelands development nor maps showing different types of wastelands have been fully prepared.

The Board which was constituted to give fresh direction and present new approach to afforestation programmes realised in 1988-89 that the approach underlying the setting up of the Board had not been translated into action thereby resulting in restructuring of its programmes.

The Board, which was responsible for coordinating and monitoring the entire afforestation activities could not create a set up for effective monitoring after spending Rs.51 lakhs. The Computer Cells which were to be set up in each State/Union Territory were either not put to any use or were not used meaningfully. In a few States these cells were not created at all. Thus, the information for effective and close monitoring of the scheme did not reach the Board.

One of the objectives of the schemes of the Board, to create people's movement, was not realised as the traditional approach adopted by the implementing agencies failed to involve people. The local community's needs were seldom taken into account while selecting species for plantation and raising of seedlings.

Some of the States received excess grants amounting to Rs.352.24 lakhs because of incorrect reporting of achievement and incorrect application of norms fixed for relase of grants by the Board. Also, funds to the tune of Rs.189.77 lakhs were diverted for works not connected with the schemes of the Board.

The scheme, Rural fuelwood plantation and afforestation of eco-sensitive non-Himalayan areas, was implemented in the same set of districts where the earlier Sixth Plan scheme for augmentation of fuelwood and fodder was operated without redefining the selection criteria. At many places, species of high timber value were planted defeating the objective of increasing fuelwood and fodder supply. Some of the districts selected by the State Goverrntments for operation of the schemes were not approved by the Board yet an expenditure of Rs.394.73 lakhs was incurred for afforestation. Apart from these, an expenditure of Rs.20.66 lakhs on advance work became wasteful as no plantation was carried out subsequently in the areas where advance work had been done.

Seedlings worth Rs. 159.70 lakhs grown under the Decentralised people's nursery scheme could not be utilised for plantation. The objective of providing income opportunity to the beneficiary nursery owners suffered set backs as the Forest Departments of the State Governments, in some States, distributed seedlings either free of cost or at a subsidised rate to the planters. The target of seedlings to be raised was not based on realistic assessment of the demands, generated by afforestation activities in the area. Also, schools could not be involved in the scheme to the extent envisaged in raising decentralised nurseries.

In the scheme for establishment of silvi-pasture farms, Rs.4.65 crores were released to the implementing agency against the Seventh Plan outlay of Rs.13 crores and the scheme was merged with another scheme after four years of operation. In Orissa, during 1986-88, farm production worth Rs.7.52 lakhs could not be sold to the consumers in the absence of any mechanism for marketing and stray browsing by cattle. In three districts of West Bengal, plantations valuing Rs. 18.63 lakhs, of which Central share was Rs.9.32 lakhs, failed. Karnataka Forest Development Corporation was paid an excess amount of Rs.63.84 lakhs. Out of Rs.112.50 lakhs released to National Dairy Development Board in 1987- 88, Rs.67.31 lakhs had remained unspent in March 1989 and no further progress was reported.

Ministry of Agriculture had stipulated, in May 1983, that a successful plantation must have 75 per cent survival of plants. But the survival of plantation in the States of Haryana, Orissa, Uttar Pradesh and West Bengal ranged from 10 to 72 per cent. The survival of plantation and seedlings have been very poor in Gujarat

and Rajasthan under the scheme of Grants-in-aid to voluntary agencies. The scheme was not evaluated at all in Tamil Nadu.

(Paragraph 6)

Ministry of Health and Family Welfare

IX. Delay in installation of laser equipment

Institute of Cytology and Preventive Oncology procured a laser equipment in April 1988 worth Rs. 9.00 lakhs which could not be installed due to lack of proper space.

(Paragraph 24)

X. Construction of animal house and laboratory building

Indian Council of Medical Research sanctioned the construction of an animal house, to replace the existing wooden structure, in National Institute of Virology, Pune at an estimated cost of Rs.4.56 lakhs. The estimate was revised to Rs.40 lakhs after three months, to Rs.90.97 lakhs after three years, to Rs.132.39 lakhs after another four years and to Rs.154.88 lakhs after one more month. The civil works were completed in 1987 but possession could not be taken as there were many defects which had not so far been rectified and the animal house could not be properly used resulting in blocking of funds to the tune of Rs.1.32 crores for over six years besides affecting adversely the research work for which the building was being constructed.

(Paragraph 27)

Ministry of Science and Technology

XI. Central Drug Research Institute, Lucknow

Central Drug Research Institute, a national laboratory under Council of Scientific and Industrial Research (CSIR), was established in 1951 to undertake research and development work in the field of drugs and pharmaceuticals.

Since its establishment in 1951, the Institute had developed technology for 75 processes . Of these, 50 processes could be released and only nine were reported to be under com mercial production.

A number of projects were dropped for reasons such as resignation of project leaders, non-availability of materials etc. 53 projects including those in thrust areas were going on for more than five years. Most of the projects in the thrust areas were continuing for 10 to 15 years.

Out of the eight projects undertaken in the area of technology for drugs and intermediates, biologicals and fermentation products, only three projects had been developed, one of which was under field trial.

Shortcomings in observance of prescribed purchase procedure leading to supply of damaged/defective equipment and non- installation/delay in installation of scientific equipment not only resulted in delay/hindrance to the research work but also caused blocking of funds and infructuous expenditure. It also resulted in avoidable payment of customs duty/demurrage and warehousing charges and over-stocking of materials.

National Information Centre for Drugs and Pharmaceuticals, which was one of the national facilities, was to earn 10 per cent of the budgetted expenditure. But the income generated fell far short of the anticipated receipt.

(Pragraph 28)

XII. Setting up a photosynthesis unit

Department of Science and Technology sanctioned a project for setting up a photosynthesis unit at an estimated cost of Rs.59.92 lakhs and released a sum of Rs.43 lakhs immediately. The project was shortclosed after spending Rs.49.80 lakhs frustrating the purpose for which it was sanctioned. Out of this amount, Rs.25.23 lakhs were spent on procuring equipment and the Department was still exploring the possibility of using the same.

(Paragraph 8)

XIII. Serial on astronomy

Department of Science and Technology released a sum of Rs.6 lakhs in May 1986 for production of a serial on astronomy but it had not so far received the research material and information of the progress made so far was also not forthcoming.

(Paragraph 9)

XIV. Equipment lying idle

Survey of India imported a photogrammetric instrument costing Rs.12.53 lakhs which was received in March 1982 in damaged condition. Eight years have since elapsed and the instrument has not been repaired and commissioned.

(Paragraph 10)

XV. Unfruitful expenditure

Central Mechanical Engineering Research Institute, Durgapur, a unit of Council of Scientific and Industrial Research, initiated a project for developing a comparable indigenous prototype and design for manufacture by Indian industry. An amount of Rs.8.91 lakhs was incurred on the project out of which equipment worth Rs.8.49 lakhs was received in June 1987. The equipment was lying idle and the project was dropped rendering entire expenditure as wasteful.

(Paragraph 29)

Another project undertaken by the Institute for developing software packages to be used by industries was foreclosed after spending about Rs.10 lakhs because of lack of interest by the user industry rendering the entire expenditure unproductive. Council of Scientific and Industrial Research stated that a separate division had been formed to devote completely to this aspect of research and development.

(Paragraph 30)

The Institute approved an in-house project in September 1983 for power production at an estimated cost of Rs.25 lakhs against which an amount of Rs.11.42 lakhs was spent and the project was dropped in December 1988 as a detailed survey indicated very poor market demand and acceptability for this project.

(Paragraph 31)

XVI. National Institute of Oceanography, Goa

National Institute of Oceanography, Goa, a unit of Council of Scientific and Industrial Research, purchased a nuclear magnetic resource spectrometer at a cost of Rs. 13.71 lakhs which was put to minimal use for over two years and not used at all for the last over 2 1/2 years.

(Paragraph 32)

The Institute while awarding the work of construction of Science Centre (guest house), deleted the electrification work on the ground that the rates quoted were disproportionate. This work was subsequently got done at an extra cost of Rs.9.40 lakhs. This also resulted in delay in the construction of the Science Centre by about three years.

(Paragraph 33)

Department of Atomic Energy

XVII. Nugatory investment

Department of Atomic Energy approved the proposal of the Heavy Water Plant, Baroda to participate in a joint captive power plant to overcome frequent powercuts by Gujarat Electricity Board. Interest free loan of Rs.16.66 lakhs was paid towards purchase of land and an amount of Rs.3.57 lakhs also released towards free consultancy charges etc. to the joint sector company. Subsequently, it was decided to withdraw participation and a request was made for refund of the amount paid which was not refunded. The decision to invest in the joint captive power plant and subsequently to withdraw from it resulted in nugatory expenditure of Rs.20.23 lakhs.

(Paragraph 11)

XVIII. Development of an alloy

Heavy Water Project, Bombay placed a work order in March 1981 on a public sector undertaking for development of an alloy for commercial production which was developed and despatched, in September 1986, to Nuclear Fuel Complex but they could not produce any tube so far. Department of Atomic Energy stated that it was a developmental effort and if developed successfully, dependance on import of tubes would be overcome.

(Paragraph 12)

XIX. Excess purchase of spares

Rajasthan Atomic Power Station had imported spares worth Rs.1.43 crores on proprietary basis which were lying unused for nearly six years and without any prospect of their use in the near future.

(Paragraph 13)

XX. Unrealistic assessment of electricity requirement

Atomic Minerals Division, Bangalore contracted much higher demand of electricity than the consumption at any point of time resulting in avoidable payment of Rs.5.48 lakhs towards electricity during September 1986 to December 1989.

Department of Electronics

XXI. Inadequate appraisal and monitoring of a project

Department of Electronics purchased a printed circuit fabrication facility reduction camera at a cost of Rs.7.22 lakhs in 1986 which could not be used for the project for which it was purchased and was still lying with the Department. It was opined that the camera be given to some other project for use.

(Paragraph 16)

Department of Space

XXII. Procurement of propellant tanks

Department of Space imported four propellant tanks and paid extra amount of over Rs.6 lakhs as bank commission to the bank for opening a letter of credit.

(Paragraph 17)

Autonomous Bodies

XXIII. Accounts and Utilisation Certificates

As on 31st March 1990, there were 34 Central autonomous bodies of Scientific Departments whose annual accounts were to be audited by the Comptroller and Auditor General of India. During 1989-90, grants/loans amounting to Rs.538.65 crores were paid by the Union Government to 17 bodies. The annual accounts for 1989-90 in respect of the remaining 17 bodies had not been received (March 1991). Of these, 15 had received grants/loans amounting to Rs.41.27 crores in 1989-90.

As per information furnished by the concerned Pay and Accounts Offices, utilisation certificates for Rs.779.51 crores were outstanding. These were outstanding since 1976-77 onwards as had been brought out in the Reports, for the last three years, of the Comptroller and Auditor General of India : Union Government (Scientific Departments) - No.7 of 1988, No.7 of 1989 and No.2 of 1990.

(Paragraph 18)

CHAPTER 1

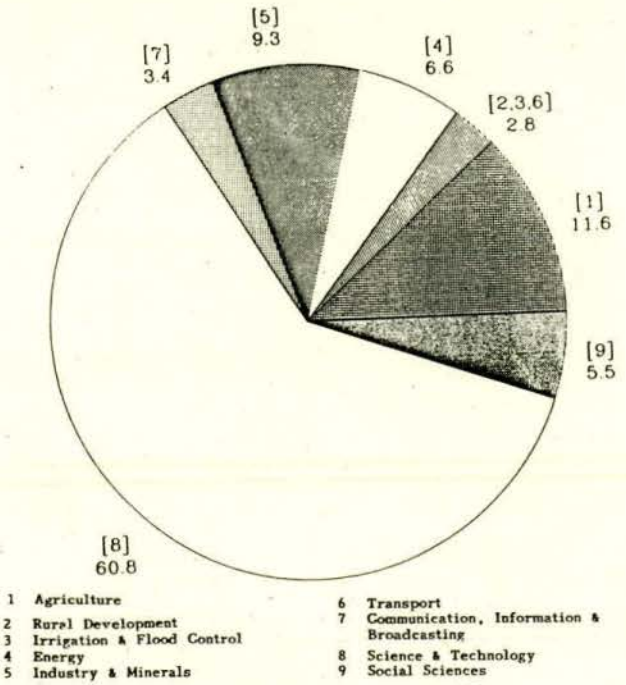
1. Financial Aspects

1.1 Science and Technology are the key to national development and prosperity. The Scientific Policy Resolution adopted in 1958 realised that "it is an inherent obligation of a great country like India, with its traditions of scholarship and original thinking and its great cultural heritage, to participate fully in the march of science, which is probably mankind's greatest enterprise today". The objectives of the Resolution are fostering, promoting and sustaining the scientific research and to develop scientists of highest quality so as to secure for the people of the country all benefits from the application of scientific knowledge. The Technology Policy Statement was adopted in 1983 for attaining technological self-reliance and to cover development, assessment, forecasting, import, absorption, adaptation etc. of technology.

1.2 In 1971, National Committee of Science and Technology(NCST) was constituted for preparing, for the first time, a separate Science and Technology plan document for the country. On the advice of NCST, the Department of Science and Technology was set up in 1971 as a nodal agency for implementing and co-ordinating activities of multi-disciplinary nature. NCST was later reconsituted in 1981 as the Science Advisory Committee to the Cabinet.

1.3 On the basis of the recommendations of the Science Advisory Committee, a large measure of autonomy has been granted to scientific departments/institutions in administrative and financial matters,with a view to accelerate the pace of development in the country by application of science and technology at a faster rate.

1.4 Allocation on Science and Technology has been increasing and it went upto an estimated Rs.7568 crores(2.4 per cent of the public sector outlay) in the Seventh Five Year Plan from Rs.20 crores (0.5 per cent of the public sector outlay) in the First Five Year Plan. India is among a few countries in the world spending over one per cent of its Gross National Product on Research and Development. The national allocation of funds on Science and Technology in the Seventh Five Year Plan and its percentage share in different socio-economic sectors were as under:-



(Source : Research and Development Statistics published by Department of Science and Technology.)

1.5 The provision of funds under Seventh Five Year Plan (1985-90) for scientific departments/organisations covered in this Report was as under :

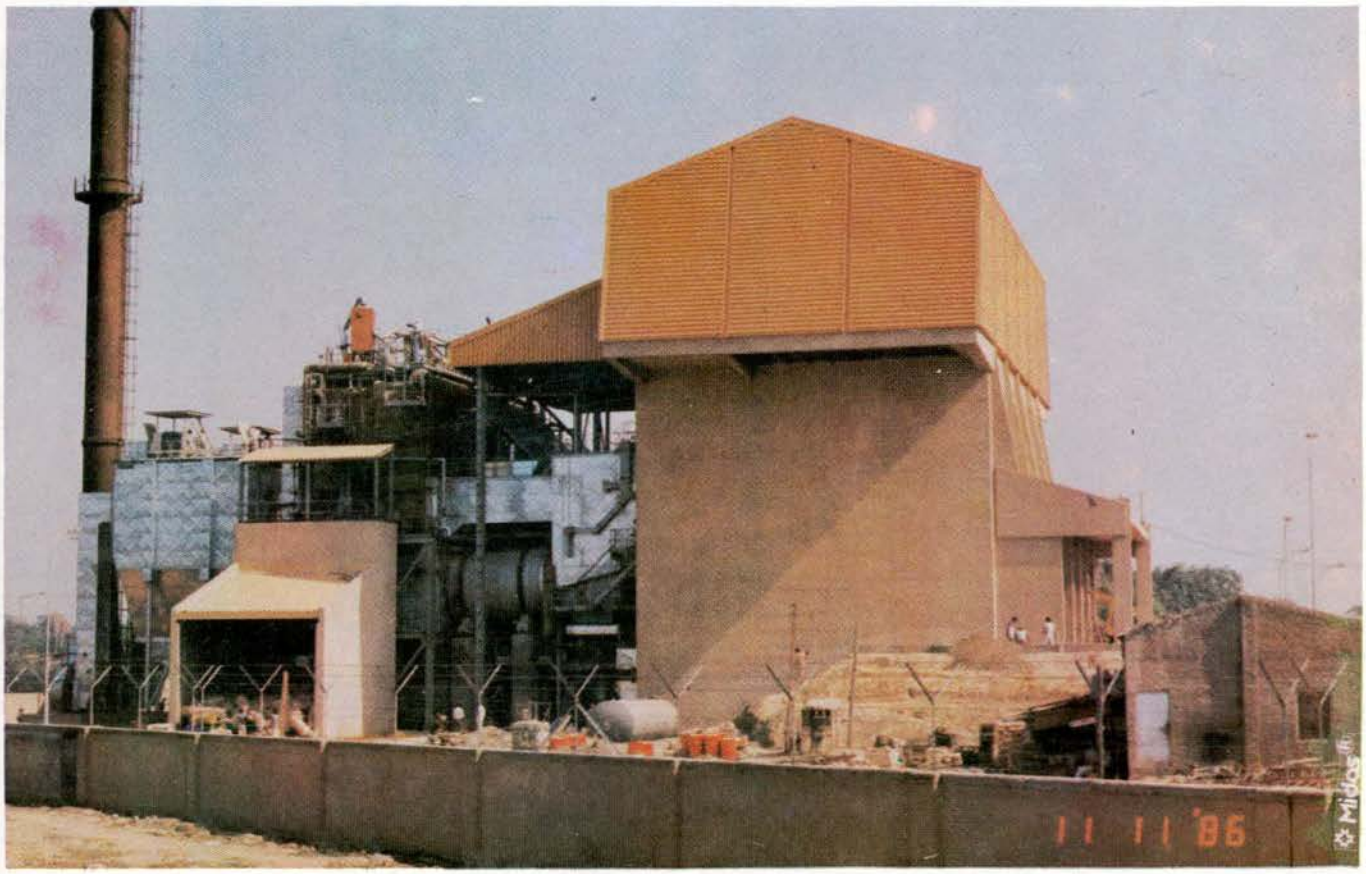
S.No.	Department/Organisation	Provision Rupees in crores)
(i)	Atomic Energy	3400.00
(ii)	Space	1760.00
(iii)	Electronics	409.00
(iv)	Non-conventional Energy Sources	412.35
(v)	Bio-technology	170.27
(vi)	Ocean Development	110.00
(vii)	Science and Technology including Survey of India, India Meteorological Department and Department of Scientific and Industrial Research	671.78
(viii)	Environment and Forests including Zoological Survey of India and Botanical Survey of India	797.00
(ix)	Indian Council of Agricultural Research 436.13	
(x)	Indian Council of Medical Research	146.20
	Total :	8312.73

1.6 The expenditure during Seventh Five Year Plan period was as under:

S.No	Department/Organisation	(Rupees in crores) 1985-86	1986-87	1987-88	1988-89	1989-90	1985-90
(i)	Atomic Energy	963.03	1098.58	1110.09	1202.20	1178.13*	5552.03
(ii)	Space	229.10	310.00	347.08	434.26	398.56*	1719.00
(iii)	Electronics	110.91	100.87	127.61	149.42	104.91	593.72
(iv)	Non-conventional Energy Sources	119.79	124.80	99.36	115.32	110.68	569.95
(v)	Bio-technology	0.04	14.32	24.43	41.49	53.82	134.10
(vi)	Ocean Development	14.12	16.29	16.24	25.09	31.21	102.95
(vii)	Science and Technology	294.54	320.02	337.19	402.61	442.96*	1797.32
(viii)	Environment and Forests	79.51	121.72	153.24	193.41	210.41*	758.29
(ix)	Indian Council of Agricultural Reserach	250.44	284.23	320.12	377.55	252.71	1485.05
(x)	Indian Council of Medical Research	39.90	38.52	43.14	63.34	45.80	230.70
	Total	2101.38	2429.35	2578.50	3004.69	2829.19*	12943.11

* Includes charged expenditure.

1.7 During the course of test audit of schemes/projects, cases of deficiencies in planning at conceptual stage, project stage etc have come to notice. Audit has come across cases of inadequate monitoring, feed-back, controls and timely corrective measures. Cases of abrupt cancellation and termination of projects and delays in providing infrastructure etc. leading to idling of considerable investment, manpower, equipment - both indigenous and imported, have also been noticed. These cases have been included in the subsequent chapters of this Report.



THE INCINERATION PLANT

Ministry of Energy

Department of Non-Conventional Energy Sources

2. Infructuous spending of foreign loan

Foreign loan, repayable in foreign exchange, to the tune of Rs.20.68 crores was obtained and a total expenditure of Rs.24.71 crores incurred on installing an imported garbage incineration plant in Delhi without detailed reliable analysis of the quality of the garbage which was to be the raw material for the plant. The 'raw material' was subsequently found unfit for the plant resulting in winding up of the project and rendering the entire expenditure infructuous.

In view of the problems faced in disposing off the garbage through conventional methods, it was decided in a meeting in Planning Commission, in September 1981, to install an incineration plant in Delhi with burning capacity of 300 tonnes of garbage per day. The plant would burn the garbage and the heat generated would be used for production of electricity.

In pursuance of the discussions in the Planning Commission, the Department of Science and Technology (where the subject matter was being dealt with, prior to the formation of the Department of Non-Conventional Energy Sources (DNES) in September 1982) requested a Danish firm called Volund Miljoteknic A/S (VOLUND), which had developed a technology for production of energy from city garbage, to submit a feasibility report for a plant of burning capacity of 300 tonnes of garbage per day. A project report prepared by VOLUND was evaluated, in February 1983, by a consulting engineer deputed by the Government of Denmark , which had shown interest in the project. The consultant concluded inter alia that the character of Delhi garbage, with an assumed average calorific value of 1500 KCal/Kg in the dry season, was close to being unfit for incineration but with time, the quality would improve and it should be collected from specific areas to ensure proper quality.

Meanwhile, the Danish International Development Agency (DANIDA) sent an expert team, in late 1982, to study the quality of garbage and other requirements. This team suggested, in February 1983, certain technical additions to the plant on the basis of a detailed analysis. After discussions with Department of Economic Affairs (DEA) and DNES, DANIDA agreed to give financial assistance for the project.

In June 1983, in an expert committee meeting held in DNES, doubts were raised regarding the calorific value of Delhi garbage. A representative of the Indian Institute of Technology (IIT), Delhi who was present at the meeting, informed that there would be no difficulty in getting garbage having the requisite average calorific value of 1500 KCal/Kg. On the other hand, Delhi Electric Supply Undertaking (DESU) and other consultants expressed their apprehensions about the sampling done by IIT Delhi in arriving at the calorific value and about suitability of the garbage for combustion. But, the Municipal Corporation of Delhi (MCD) assured that there would be no problem in sorting out good quality of garbage for use in the plant and said that the humidity which could be upto 40 per cent could also be controlled by drying the garbage in the sun before sending it for incineration. Not satisfied with the assurances given, DESU had felt that the question of drying of garbage should be thoroughly examined before a decision in regard to the erection of the plant was taken. IIT Delhi had been entrusted, in May 1982, with analysis of municipal solid waste of Delhi. Despite repeated reminders from DNES, IIT was yet to submit its report. DNES stated, in November 1990, that the work of garbage analysis entrusted to IIT was closed in April 1985 as the report had been unduly delayed and having awarded the work to VOLUND, there was hardly any necessity of awaiting the report.

Notwithstanding the uncertainties regarding suitability of Delhi garbage for the incineration plant and without getting the garbage analysis report from the IIT, a note for the Cabinet proposing installation of the plant at Timarpur, Delhi was submitted by DNES in May 1984. Apart from burning 300 tonnes of garbage per day, the plant was to produce nearly 2.11 crore units of electrical power per annum at 69.5 per cent plant utilisation factor. The plant was to be commissioned at a total cost of Rs. 231.78 lakhs within a period of 24 months from the effective date of contract, signed on 24th July 1984, between DNES and VOLUND . According to the note for the Cabinet, the Government of Denmark had agreed to provide interest free loan of 125 million Danish Kroners (Rs.13.75 crores approximately) repayable in fifty half- yearly equal instalments commencing in 1994. The terms provided that the work was to be done by a Danish firm only. The amount of foreign loan was raised to 153.50 million Danish Kroners by the time the agreement was signed with VOLUND in 1984 and finally the Government of Denmark gave 160.11 million Danish

Kroners (Rs.20.68 crores approximately), as loan, by 1989. They also gave an outright grant amounting to Rs.1.066 crores in 1989-90.

According to the contract, scope of work was to "construct and put into satisfactory operation the solid waste disposal and energy recovery facility". Bharat Heavy Electricals Limited (BHEL), a public sector undertaking, was made implementing agency to DNES, which was responsible for funding, coordination, direction and monitoring of progress of the work. MCD was entrusted with providing garbage of the desired quality. The plant was to be handed over to MCD after two years of controlled operation by BHEL. Land for the project was provided by Delhi Administration free of cost.

VOLUND completed installation work of the project by March 1987, delayed by eight months, after which the trial runs were started. DNES stated, in November 1990, that there was no delay on the part of the firm as the land at the selected site was made available by Delhi Administration only in February 1985. The plant has been put on trial runs on several occasions since March 1987 but could never operate for desirable length of time. It could not be proved during these test runs due to "nonavailability of the specified quality of garbage". DNES felt that "there are inherent defects in the plant which need to be immediately rectified under warranty." The test runs were also conducted, in April 1988, in the presence of consultants from West Germany, appointed by DANIDA, who concluded that the average calorific value of the garbage received was between 550-850 KCal/kg and improvement in the quality of the garbage was required for bringing it to 1462.50 KCal/kg.

As VOLUND was reporting that the plant was not running because of poor quality of garbage which could not negotiate satisfactorily for incineration, a meeting was held, in January 1989, in DEA with DANIDA. An agreement was signed between DNES, DEA and DANIDA, in January 1989, according to which plant would be taken over from VOLUND not later than 28th February 1989 and would be handed over to the Indian firm for maintenance, management and operation from March 1989 for a period of one year and the cost for the same would be mainly met by DANIDA.

The 72-hour test runs commenced on 21st February 1989. No definite conclusions could be reached on the basis of these runs. Nevertheless the plant was handed over to the Indian firm in April 1989. The Indian firm partially operated the plant with manually screened and sun-dried garbage but was not able to smoothly operate the plant due to (a) excess quantity of silt (b) absence of moisture free garbage and (c) certain defects in the turbine. DNES stated, in November 1990, that there were no defects in the turbine.

The original agreement provided for claiming liquidated damages from the VOLUND at the rate of 0.25 per cent of the total contract price for each week of delay and not exceeding 7.5 per cent of the total contract price, if it failed to successfully complete the trial operation of the facility within the time fixed. DNES did not claim the amount of liquidated damages of Rs.1.35 crores due from VOLUND for not completing the trial operation successfully within the stipulated time frame. DNES stated, in November 1990, that liquidated damages had not been levied on the firm as it was not solely responsible and the trial operations could not be completed due to non-availability of required quality of garbage.

The estimated cost of the entire project including the power generation component and infrastructure facility was Rs.18 crores. In the event of the total expenditure exceeding original estimate by 20 per cent or more, Cabinet approval was required to be sought again. The total expenditure on this project till November 1990 was Rs.24.706 crores. A note on the subject was submitted to Cabinet in June 1990 and the Cabinet finally decided to wind up the project .

Audit scrutiny revealed :

- *Although the quality of the garbage which was the raw material for the plant, was one of the crucial factors for this project, without doing any detailed reliable analysis of the garbage, a foreign loan was obtained with the condition that the project would be executed only through a foreign firm. The 'raw material' was later found unfit for the plant.*

- *DNES took over the plant from VOLUND at a stage when it was not operating satisfactorily.*

- *DNES did not claim the liquidated damages amounting to Rs.1.35 crores from VOLUND.*

- *After more than three years of its setting up and spending Rs.24.706 crores, the plant had been inoperative and it has been decided to wind up the project rendering the whole expenditure infructuous.*

3. Magneto Hydro Dynamics Research Project

A research and development project for creating indigenous capability for economic generation of power through Magneto Hydro Dynamic process, using coal

THE MHD PILOT PLANT

as fuel, had still to realise its objective even after 13 years of its inception and incurring an expenditure of Rs 26 crores. Test runs have been carried out with liquefied petroleum gas (LPG) eventhough the fuel option was foreclosed in 1976.

Department of Science and Technology in a note for the Cabinet in November 1976, recommended creation of a Research and Development (R&D) facility for generation of energy through coal based Magneto Hydro Dynamics (MHD) process. The need for such an R&D project was felt in the light of the acute energy crunch the world was facing and the rate at which the existing energy sources were depleting. The note for the Cabinet inter alia stated that as coal is considered to be the primary source of energy by the Fuel Policy Committee for power generation in the country and considering its abundance, the national economic advantage lay in evolving technologies that would exploit this source better. It was also felt that if MHD technology is mastered with coal it could subsequently be developed with natural gas, but the reverse would not naturally follow.

MHD is a system of direct conversion of heat into electrical energy and if it is coupled with a conventional power plant, the efficiency of recovery of electrical power can be stepped up to as much as 50 to 60 per cent as against 37 to 38 per cent in the conventional processes . Apart from this the MHD process has the advantages of low consumption of water and lesser discharge of pollutants . The note for the Cabinet indicated that besides the environmental benefits, this process could result in the saving of one million tonnes of coal annually at a generation level of 1000 megawatts (MW) of electricity.

The project consisted of an R&D facility and an experimental coal based MHD power plant of 5 MW thermal input (one of the most important input parameters) at the Bharat Heavy Electricals Limited (BHEL) complex at Tiruchirappalli in Tamil Nadu. The work was to be jointly executed by Bhabha Atomic Research Centre (BARC) , Bombay and BHEL with technical consultation provided by the Institute for High Temperature, Moscow, as per the agreement reached between the Government of India and the Government of USSR. The formal sanction was accorded in May 1977 with a financial outlay of Rs 11.78 crores and the project was to be completed by 1980-81. The project cost provided, at June 1975 prices, inter alia for (a) data recording and processing systems, (b) centralised control panels and automated control systems, (c) certain advanced simulation experiments, (d) certain special facilities for testing combustors, air preheater,materials etc and (e) built in provision in the layout for increasing the rating. The sanction also envisaged the constitution of a Steering Committee headed by the Secretary, Department of Science and Technology (DST) which would be responsible for monitoring and allocating resources .DST , which was dealing with the subject prior to the formation of the Department of Non- Conventional Energy Sources (DNES) in September 1982 was also to make a detailed review on the completion of two years, examining the question of continuance and revision of the outlay before committing resources for major items of equipment, to the extent possible.

In the first meeting of the Steering Committee,held in October 1977,the Chairman was informed by the representative of the BHEL that a Blue Water Gas (BWG) plant would be installed at the project site to provide fuel to the experimental MHD plant. In March 1978 , the Project Director prepared a status report detailing the project outline. While contending that the project was fully based on coal technology he stated that in view of the experiences gained by the other countries using clean gaseous fuel and direct coal combustion experiments , the Indian approach would consist of using coal gas in the first phase of development, i.e, setting up of MHD pilot plant with 5 MW thermal input and carrying out experiments. It was also claimed that because of the high ash content in the indigenous coal the coal gasification route would be preferred which would eliminate the problems associated with slag and ash but yield useful data on coal gas as fuel.

A BWG plant at the BHEL complex at Bhopal was selected for fuel supply (blue water gas is a fuel gas which is generated by reacting steam with burning coal). This plant was being phased out as BHEL had planned to switch over to LPG for their activities. The BWG plant from Bhopal was brought and installed at the project site at Tiruchirappalli at a cost of Rs.49.53 lakhs after certain modifications . The BWG plant was considered to be sufficient for providing heat requirements of the MHD plant. However, after installation it was discovered that the plant could operate only at 70 per cent of the rated capacity and could not fully meet the energy requirement of the plant.

The Steering Committee decided, in November 1984, that the objective of the project, as set out in the original document approved by the Cabinet, was to develop a 5 MW thermal input MHD pilot plant, its commissioning with the generation of plasma could be treated as completion of the project, disregarding the input parameters set for the completion. It was also decided that the two years' experimentation would not form the part of the original project. The expenditure on the project upto January 1984 had climbed to Rs.16.20 crores and it was decided by the Steering Committee

that certain capital assets of the project should be transferred to BHEL and BARC so that "there may not be any need for seeking Cabinet's approval". BHEL agreed to adjust Rs.2 crores worth of material against the future grant and an adjustment of Rs.1.75 crores was proposed from the future grants for BARC against acquisition of material development laboratory and other equipment. In March 1985, the first run of the experimental MHD plant was carried out with successful generation of plasma, although at greatly reduced input parameters and no power was generated, but the project was declared as completed, by the Steering Committee, with revised outlay of Rs 13.91 crores.

The Department contended (December 1990) that a review of the expenditure incurred revealed that funds were spent by BARC on many items not originally included in the estimates and also on certain items which were needed in the post commissioning phase of the project. Likewise, BHEL had also charged the expenditure on buildings for the oxygen plant and simulation test facility to the project cost. These items of expenditure were transferred to them and the total expenditure was brought within 20 per cent over the original outlay. It was also stated that since the total expenditure was within 20 per cent over the outlay, Cabinet's approval was not required. The Department further claimed that treating generation of plasma only as completion of the project was not contrary to the goals approved by the Cabinet.

The note approved by the Cabinet had however clearly spelt out the target of the project as commissioning of a 5 MW MHD pilot plant and not for a pilot plant of reduced capacity. Also, more trial runs were carried out and in April 1986 the plant was operated at full rated parameters which included 5 MW thermal input and generated three Kilo Watt of electricity. Thus, the essential parameter, 5 MW thermal input was achieved only in April 1986 and, therefore, release of funds during 1985-86 amounting to Rs 3 crores could not rightfully be kept out of the project cost. It is apparent that in 1984 the Steering Committee started the efforts to limit the project cost so that Cabinet's approval for the continuation of the project was avoided. Treating plasma generation as successful completion of the project also helped in restricting the cost.

The Steering Committee in the meanwhile had begun to harbour fresh doubts on the fuel option adopted for the project. The Chairman of the Committee felt, in 1984, that BWG would not be the fuel for the future MHD programme and was selected for initial experimentation based on certain considerations in the beginning of the project. Now, in view of the changed circumstances other fuels such as LPG, natural gas, naptha or direct burning of coal should be examined. Selection of gas as the fuel for future plans had already become a foregone conclusion as the Steering Committee had already accepted in their meeting held in August 1982 that immediate aim of this project was to commercialise a natural gas fired MHD plant in 1986-90 and a coal based plant in 1990-2000. On the advice of the Chairman of the Steering Committee enquiries were made about the availability of LPG and it was found that a change over was possible at a capital cost of Rs.60 lakhs. The Committee also felt that LPG equally served the objectives of the project. (In the note approved by the Cabinet in 1976, quite a contrary view had been expressed.) As a result of this decision, subsequent trial runs were carried out with LPG as fuel. Thus, the strategy for the development of a coal based MHD plant had been reversed and the course adopted was through a gas based plant.

In the meeting of the Technical Evaluation and Monitoring Committee, in 1987, it was observed that the project was still far from the final goal of a coal based MHD programme and the efforts needed to be intensified in this direction. In the Steering Committee's meeting, held in October 1989 , while discussing the future of this project in the context of Eighth Five Year Plan , it was decided that for full exploitation of MHD process, development of a 'retrofit' (system of interfacing a MHD generator at the top end of a conventional thermal power plant) appears to be the only logical course of action. Between 1986 and 1989 BHEL experts had submitted two project reports on the viability of a retrofit MHD plant in the Indian context. In the reports submitted to the Steering Committee it was felt that a stand-alone MHD plant would be viable only at a capacity of 200 MW of electricity generation and an investment of such a magnitude may not be advisable unless the commercial potential of the system was fully tested. With this view , proposal for retrofitting the MHD plant was mooted and Ennore Power Plant in Tamil Nadu was selected as the installation site.

As most of the large scale power plants in India are run on coal, development of MHD process by direct burning of coal was felt necessary. The Steering Committee had already changed the fuel option for the pilot plant and most of the trial runs were conducted with LPG as fuel. Also, the behaviour of the plant had not been tested with a direct coal combustor. Hence even for the retrofit development, the project was divided into two stages covering a 15 -year perspective plan, starting from 1986 ; the first stage involved installation of a gas fired retrofit system to be completed in a span of five years; in the second stage, development of direct coal fired MHD system was contemplated. The technology

which was being considered for retrofit application was based on LPG and the objective of developing a coal fired MHD system was not likely to be achieved in the near future, which was quite contrary to the mandate given by the Cabinet in 1976 when the gas option at the initial developmental stage had been rejected categorically. Appropriate approval for the change in fuel option had not been sought. The Department asserted, in their reply in December 1990, that ultimate aim of the project still continues to be the development of a coal based MHD power plant and this has to be achieved through successive stages.

In sum:

- *The project which started in 1977 with a total outlay of Rs.11.78 crores was to be completed in 1982. Contrary to the mandate of commissioning of a 5 MW MHD pilot power plant, the Steering Committee decided, in November 1984, that commissioning of a plant to generate plasma could be taken as achievement of the objectives. The plant was taken as commissioned in March 1985 with reduced parameters.*

- *The pilot plant was being run on LPG instead of coal contravening the approved project proposal in which it had been stated that MHD technology once mastered with coal could subsequently be developed with gas but the reverse would not naturally follow.*

- *The objective of the programme to set up coal-based MHD power plant, for creating indigenous capability for generating power economically, using MHD technology, is still a distant goal.*

4. Release of grants-in-aid

Punjab Agro Industries Corporation proposed, in September 1986, installation of a 1.5 MW power generation plant, using rice husk, at a total outlay of Rs.2.9 crores. In March 1987, the Department of Non-Conventional Energy Sources sanctioned the proposal with the Department's share being Rs.1.45 crores to be released as grants-in-aid to the Government of Punjab. This sanction stipulated that (a) further funds would be released only after the share of the Corporation and the Punjab Government were spent, (b) the consultants appointed by the Corporation for this project would be paid for by the Corporation and (c) any increase in cost will be borne by the Corporation or Government of Punjab. A sum of Rs.10 lakhs for meeting preliminary expenses during 1986-87 were also released to the State Government alongwith the sanction.

In February 1988, the Corporation informed the Department that (i) it would be economically more viable if the project capacity was increased to 2.5 MW with a total outlay of around Rs.4.5 crores and (ii) more funds were required as the initial amount of Rs.10 lakhs had been spent on tender preparation, departmental charges and part payment to the consultants. The Department was requested to increase their share to Rs.2.5 crores and release an amount of Rs.1.25 crores immediately as the initial share. Based on this, an amount of Rs.1.00 crore was released, in March 1988, by the Department.

In January 1990, the Government of Punjab informed that the cost of generation of 2.5 MW with eight tonnes producing steam would be nearly Rs.10 crores and asked the Department to increase their share correspondingly to Rs.5 crores. Under the new scheme proposed by the Corporation private promoters were also involved and import of technology was not ruled out. The Department stated, in November 1990, that they did not agree to the proposal in view of the considerable increase in the capital cost and a proposal to introduce private sector tehcnical/financial collaborator. It was decided to withdraw the financial support to this project and ask the State Government to refund the money with interest.

Thus, the Department committed itself to the project and released a sum of Rs.1.10 crore without proper appraisal of the viability of the project. As a result, Rs.1.00 crore has been lying unutilised with the Government of Punjab for nearly three years besides wasteful expenditure of Rs.10 lakhs.

5. Windmill demonstration project

Department of Non-Conventional Energy Sources had undertaken the Wind Pump Demonstration Programme during the Seventh Plan to obtain a more extensive user response, to create awareness in newer areas and to provide inputs for a subsequent extension programme. Under the programme, the Department sanctioned a project, in January 1987, for 150 water pumping windmills in Andhra Pradesh. The cost of the project was Rs.23.59 lakhs and it was to be completed by September 1987.

The project was assigned to Non-Conventional Energy Development Corporation of Andhra Pradesh. The Department released Rs.18 lakhs, in January 1987, to the Corporation.

In June 1989, the Corporation informed the Department that out of 150 windmills sanctioned, 77 windmills had been procured and transported to site. It added that 12-PU-500 model water pumping windmills (procured under this project) were not functioning well even though necessary precautions had been taken for maintenance. A request was made to allow the Corporation to import certain wind pumps. In July 1989, the request was repeated by the Corporation.

In September 1989, the Corporation stated that in view of frequent failures and maintenance problems, the beneficieries were reluctant to come forward for the particular model of windmill where the failure rate was about 90 per cent whereas other models were functioning well. The Corporation was not keen to put up these windmills and terminated, in July 1989, the supply orders for the remaining 73 windmills which were yet to be procured.

The Department stated, in September 1990, that out of 77 windmills already procured, 29 of the 67 installed were found to be in working order. It was also stated by the Department that they had obtained refund from the Corporation of the unutilised funds to the extent of Rs.5.98 lakhs. The Corporation was also asked to refund Rs.1.57 lakhs being the cost of the 10 uninstalled windmills.

Thus, against a sanction for 150 windmills for the demonstration programme, 77 were procured at Rs.12.02 lakhs. Out of the 77, only 29 were reportedly in working order and the money spent on the remaining 48 (about Rs.7.49 lakhs) was unproductive. Besides, because of the large-scale failure of the windmills in the demonstration programme, the beneficieries were not coming forward for the windmills. Obviously, user response and awareness in newer areas of energy sources would have been adversely affected.

Ministry of Environment and Forests

Department of Environment, Forests and Wildlife

6. National Wastelands Development Board

6.1 Introduction

Out of the total land mass of 329 million hectares only about 35 million hectares of land in the country is estimated to be under good forest cover. National Forest Policy has prescribed that 33 1/3 per cent should be under forests for maintenance of ecological balance and meeting basic needs of fuelwood, fodder and water. While the area under tree cover is declining at an estimated 1.5 million hectares per annum, lands under agriculture and common use are also getting degraded due to pressure of population, over-grazing and unscientific land use. As much as 175 million hectares of land in the country is subject to some form of degradation and is in need of attention. In order to overcome the ecological and socio-economic crisis, the National Wastelands Development Board (Board) was set up in May 1985 in the Ministry of Environment and Forests.

6.2 Scope of Audit

The Board is audited under Section 13 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971. Records relating to the schemes of the Board were test checked in the office of the Board as well as in 20 States namely Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Sikkim, Uttar Pradesh and West Bengal. The time frame selected for review covered the Seventh Plan period (1985-90).

A draft review was sent to the Ministry, in October 1990, for confirmation of facts and figures and comments, if any. The reply of the Ministry, received in February 1991, has been taken into account in finalising this review.

6.3 Organisational set up

The National Land use Board under the Ministry of Agriculture and Rural Development was reconstituted in May 1985 as National Land use and Wastelands Development Council under the chairmanship of the Prime Minister. The Council is the highest policy planning agency for all issues concerning management of country's land resources. Under the Council, National Land use and Conservation Board was constituted within the Ministry of Agriculture and Rural Development and National Wastelands Development Board was constituted within the Ministry of Environment and Forests for formulating, funding and coordinating schemes for scientific land use and regeneration of wastelands. Recommendations of these Boards which involve larger policy issues are placed before the Council for taking a final view.

The National Wastelands Development Board has a Chairman, a Vice Chairman and 20 members. Union Minister for Environment and Forests and Union Minister of State for Environment and Forests are the ex-officio Chairman and Vice Chairman respectively of the Board. The Secretary to the Government of India,

Department of Environment and Forests is the Member-Secretary of the Board. There are nine ex-officio members and ten nominated members. The Board's office is located in New Delhi with a sanctioned strength of 141 personnel.

At the national level, the Board functions as the nodal agency to coordinate and monitor the wastelands development projects being implemented by the States and Union Territories under the Centrally sponsored schemes of the Board, the Department of Rural Development and the Department of Agriculture and Cooperation and also the schemes taken up under the State plans.

In most States, the Principal Chief Conservator of Forests or the head of the Forest Department is the nodal authority for the implementation of the schemes of the Board.

6.4 Highlights

- *Even after five years of the commencement of the National Wastelands Identification Project, no reliable data base has been developed on related aspects of wastelands development nor maps showing different types of wastelands have been fully prepared.*

- *The Board which was constituted to give fresh direction and present new approach to afforestation programmes, realised in 1988-89 that the approach underlying the setting up of the Board had not been translated into action thereby resulting in restructuring of its programmes.*

- *The Board is responsible for monitoring and overseeing all afforestation activities. But, it finances only about 10 to 15 per cent of the afforestation activities.*

- *Funds for the activities of the Board are provided by the Central Government. Against the plan provision of Rs.295 crores, the actual expenditure incurred by the Board during the Seventh Five Year Plan period (1985-90) amounted to Rs.250.98 crores including Rs.27.43 crores as loans to State Governments. An analysis of the grants released by the Board during the Seventh Plan period indicates that the ratio of grants received by a State to the total area of wastelands in that State varied widely from State to State; from Rs.4.93 per hectare of wastelands in Rajasthan to Rs.93.69 in Sikkim. Apparently, there is a need for greater awareness in a number of States to avail of the facilities provided by the Board for the important activity of reclamation of wastelands especially in view of the under utilisation of the Plan funds.*

- *Due to incorrect reporting of progress of achievements under the schemes, the States obtained an excess Central assistance of Rs.99.16 lakhs from the Board. Also, Central assistance of Rs.253.08 lakhs was incorrectly released to Himachal Pradesh, Madhya Pradesh, Mizoram and Uttar Pradesh.*

- *Funds to the tune of Rs.189.77 lakhs were diverted/utilised for works not relevant to the schemes of the Board.*

- *The Rural fuelwood plantation and afforestation of eco-sensitive non-Himalayan areas scheme was implemented in the same set of districts where the Sixth Plan scheme for augmentation of fuelwood and fodder was operated, without redefining the selection criteria for the new scheme. The scheme was operated, in some States, in districts which were not approved thereby incurring unauthorised expenditure of Rs.394.73 lakhs. Contrary to the objectives of the scheme, species planted either had more timber value than fuel or were slow growing. In some cases, plantation was not carried out in areas where advance works had been done at an expenditure of Rs. 20.66 lakhs.*

- *Under the Decentralised people's nurseries scheme, targets of seedlings were not based on a realistic assessment of afforestation and other like activities being carried out by other departments. It was noticed that seedlings worth Rs.159.70 lakhs were either damaged or unutilised. Also, contrary to the guidelines of the scheme, the Forest Department of the States distributed seedlings free of cost or at subsidised rates to the planters thereby making it very difficult for the nursery owners to market seedlings and earn returns. Amounts spent on school nurseries in some States were far below the prescribed norm of 30 per cent of the total outlay.*

- *The scheme 'Establishment of silvi pasture farms' had the objective of making available nutritious grass and fodder at reasonable price*

in rural areas. As the scheme did not prove popular, it was merged with another scheme namely 'Fuelwood and fodder project scheme' from April 1990 after spending Rs.4.65 crores against the plan outlay of Rs.13 crores. In Orissa, the farms were allowed to be browsed and grazed by the local cattle resulting in non-harvesting of the produce and estimated loss of Rs.7.52 lakhs during 1986-88. In three districts of West Bengal, plantations were failure resulting in nugatory expenditure of Rs.18.63 lakhs of which Rs.9.32 lakhs was Central share. In Karnataka, the scheme was implemented through the Karnataka Forest Development Corporation which was paid an excess amount of Rs.63.84 lakhs. Out of Rs.112.50 lakhs released to the National Dairy Development Board (NDDB) in 1987-88, Rs.67.31 lakhs had remained unspent in March 1989 and no further progress report and utilisation certificates were furnished by NDDB.

- *The Board released a sum of Rs.20.48 crores during 1985-90 as grants to voluntary organisations in respect of 336 projects. In Gujarat, Forest Department's evaluation (June 1989) of two projects implemented by non government organisations revealed that survival of seedlings raised was as low as eight per cent. In Tamil Nadu, implementation of project through non-government organisation had not been evaluated while in Rajasthan the survival of plantation by a voluntary organisation was poor due to faulty planting technique.*

- *According to norms laid down by the Ministry of Agriculture in May 1983, a successful plantation must have at least 75 per cent survival. But, the survival rates of plantation under the schemes of the Board in the States of Haryana, Orissa, Utter Pradesh and West Bengal varied from 10 per cent to 72 per cent. In some cases, the loss of plants was attributed to sandy soil, white ants and drought.*

- *One of the objectives of the schemes of the Board was to create people's movement for afforestation activities as against wage earning in plantation work. There was little progress in this direction as the implementing authorities adhered to their normal or traditional methods of work which failed to evoke enthusiasm. Species of plants, trees etc. for plantation were generally chosen with little regard to what the local communities would need and most often on the basis of what was readily possible. People's participation was being secured only through employment for wage earning.*

- *-The Board is to act as the nodal point for monitoring various programmes related to afforestation and wastelands development. Inspite of the investment of Rs.51 lakhs in creating computerised monitoring and evaluation system, the aim of timely receipt of detailed information was not achieved and the reports furnished by the State Governments continued to present data/information in the traditional way broadly indicating the physical achievement and not mentioning crucial detailed information like the socio- economic status of beneficiary, species of tree planted, income generated through sale of seedlings, fodder etc. There was no mechanism to detect or check misreporting.*

6.5 Functions

The Board was entrusted with the following main functions :

(i) formulate perspective plan and programmes within the overall national policy for the management and development of wastelands;

(ii) identify wastelands in the country to be covered under the programme of the Board;

(iii) promote, encourage and finance development of wastelands in the country through the active involvement of non-government organisations, voluntary agencies and the public at large including the landless;

(iv) collaborate with the Central and State Government departments, agencies, local bodies and voluntary agencies for mobilising manpower, funds and other inputs;

(v) create a reliable data base and documentation on related aspects of wastelands development;

(vi) interact with financial institutions for funding wastelands development programmes;

(vii) create general awareness through education for wastelands development and

(viii) act in collaboration with the National Land use and Conservation Board for matters of common concern.

Apart from these broad functions, the Board, in its endeavours to create a public movement for wastelands development, is also to review and monitor all such projects, sponsor development of appropriate technology and management practices and promote studies by expert groups on specific subjects and schemes.

6.6 Identification of wastelands

There is no well accepted definition or categorisation of wastelands. Different categories of lands are considered as wastelands by different groups. In order to attempt a uniform categorisation of wastelands in the country, a task force was set up by the Board which submitted its report in 1986. According to this report wasteland is that land which is degraded and is lying unutilised except as current fallow.

The National Commission on Agriculture had estimated, in 1976, that approximately 1750 lakh hectares of land was affected by the problem of soil erosion and soil degradation. This included 1046.70 lakh hectares of cultivable land (including 870 lakh hectares of eroded land and permanent pastures), 194.90 lakh hectares of forest land, 79.10 lakh hectares of uncultivable non-forest land and 430 lakh hectares of land with special problems (saline, alkaline, desert, ravines etc).

In order to make a systematic study of wastelands for supporting wastelands development schemes, a National Wastelands Identification Project was started by the Board, in December 1986, in 147 districts of 19 States which were estimated to have more than 15 per cent of the area as wastelands. The project was executed in technical collaboration with the Department of Space and the Survey of India. Under this project, maps showing different types of wastelands in 147 districts covering an area of 239.10 lakh hectares, had been prepared with the help of remote sensing techniques and made available to State Governments during 1989-90. Steps were also initiated to map another 75 districts which were estimated to have 10 to 15 percent of their area as wastelands.

After five years of the formation of the Board, one of the objectives of the Board, viz., to identify the wastelands in the country had not been fully achieved. The National Wastelands Identification Project which was to provide information for the formulation of other projects of the Board had not been completed and socio-economic and tenancy status of various degraded land units had not been determined till the end of Seventh Plan. Also, the Board had not been able to achieve the objective of creating a national data base and documentation centre on related aspects of wastelands development.

The Ministry stated, in February 1991, that the National Wastelands Identification Project could be carried out only in a phased manner as per the resources available in the Board. It added that it took some time in the initial stages in the creation of infrastructure, training the staff and imbibing the new technology relating to production of wasteland maps based on remote sensing data. The Ministry also accepted that the yearly target set by it were not based on the information derived from these maps. A gross estimate of wastelands derived from different sources already existed and targets were set keeping overall picture in view and past performance of the States. It also stated that the estimates of wastelands made by the Society for Promotion of Wastelands Development were available but these were guess estimates which differed considerably from similar estimates made by other organisations. According to the Ministry, these cannot, therefore, be relied upon to a very great extent for field work, but may be used as one of the inputs for planning purposes at the national level, until a more reliable data base is available. Mapping of wastelands area in 84 districts was expected to be ready by the end of 1991.

Thus, the planning for regeneration of wastelands was not based on reliable data.

6.7 Strategy for wastelands development

Prior to Seventh Plan, the strategy for management and reclamation of wastelands was to grow more trees. A sample survey conducted, in 1988, by Indian Institute of Public Opinion, in Gujarat, Karnataka, Tamil Nadu, Uttar Pardesh and West Bengal showed that 50 per cent of trees grown under social forestry programme, continued to be eucalyptus which is unsuitable for meeting fuelwood and fodder needs. Instead of providing fuelwood and fodder, the afforestation programme had largely provided raw material to paper, pulp and building industry, by-passing the rural poor and further exposing the land to degradation caused by commercial exploitation. The new strategy, therefore, was to develop a people's movement for afforestation by involving landless and mar-

ginal farmers. This was to be achieved through (a) involvement of people in afforestation programmes especially marginal farmers and the landless poor, (b) wide-spread involvement of government and other non-government agencies, (c) greater emphasis on development of fuel-wood and fodder and (d) evolving ways of securing institutional support.

The Board reviewed its programmes carried out over the four years, i.e., 1985-89, and noticed that the approach underlying the setting up of the Board had not been effectively translated into action since the programmes had remained confined in strait jackets of Sixth Plan schemes and concentrated on the implementation of social forestry programmes. The Board, therefore, restructured its programmes during 1989-90 and adopted an integrated approach to wastelands development.

6.8 Activities of the Board

6.8.1 During the Seventh Plan period, the Board took up the following programmes/schemes:-

(a) Rural fuelwood plantation and afforestation of eco-sensitive non- Himalayan areas;

(b) Soil, water and tree conservation in the Himalayas (Operation Soilwatch);

(c) De-centralised people's nurseries;

(d) Establishment of silvi pasture farms;

(e) Aerial seeding programme;

(f) Area oriented fuelwood/fodder scheme;

(g) Minor forests plantation scheme;

(h) Seed development scheme;

(i) Integrated wastelands development projects;

(j) Grants-in-aid to voluntary agencies and

(k) Margin money assistance to autonomous bodies/ corporations.

6.8.2 Besides the programmes taken up by the Board, following schemes, covering inter alia afforestation, were being implemented by the Department of Rural Development:

(i) Jawahar Rozgar Yojna

(ii) Drought Prone Area Programme

(iii) Desert Development Programme

Also, the following externally aided social forestry projects were under implementation:

(i) Social forestry projects supported by Swedish International Development Agency (SIDA) in Andhra Pradesh, Bihar, Orissa and Tamil Nadu;

(ii) Social forestry projects supported by World Bank in Karnataka, Kerala, Rajasthan, Uttar Pradesh and West Bengal;

(iii) Maharashtra social forestry project supported by US-AID and

(iv) Social forestry project supported by World Bank/ Danish International Development Agency (DANIDA) in Haryana and Jammu and Kashmir.

The Board was made responsible for monitoring and overseeing all the afforestation programmes in the country.

The Board's share in the overall afforestation activities in the country during the Seventh Plan period was as follows:

TYPICAL WASTELANDS – RAJASTHAN DESERTS

	1985-86	1986-87	1987-88	1988-89	1989-90	Total
Targets(in million hectares)	1.45	1.71	1.79	2.00	1.71	8.66
Actuals(in million hectares)	1.51	1.76	1.77	2.10	1.72*	8.86
Outlays(Rupees in crores)	384.94	492.48	540.83	620.48	504.00	2542.73
Board's share	48.00	52.48	66.50	66.00	72.56	305.54**

* Final figures awaited.

** Note - These figures have been taken from the mission document for the Integrated Wastelands Development Project. The actual provision of funds for the Seventh Plan period, however, was Rs.295 crores

It may be seen that though the Board is responsible for monitoring and overseeing all afforestation activities, it finances only about 10 to 15 per cent of the afforestation activities.

6.9 Plan outlay and expenditure

Funds for the activities of the Board are provided by the Central Government The Seventh Plan outlay was Rs.295 crores. The actual expenditure incurred by the Board during 1985-86 to 1989-90 amounted to Rs.250.98 crores as indicated below:-

Scheme/Programme	Seventh Plan Outlay	Expenditure
Central Sector	(Rs. in crores)	
1. Establishment of the Board	4.80	3.08
2. Professional and special services	1.30	0.66
3. Advertising and publicity	5.00	0.65
4. Grants-in-aid to voluntary agencies	58.00	20.48
5. Monitoring and evaluation	5.00	4.58
6. Margin money assistance to autonomous bodies etc.	32.00	0.92
7. Central Support Unit	0.00	1.38
	76.10	31.75
Centrally Sponsored Schemes		
1. Operation Soil Watch	50.00	59.07 *
2. Rural fuelwood plantation	108.00	85.47
3. Silvipastural farms	13.00	3.50
4. Decentralised People's Nurseries	47.90	56.44
5. Aerial seedling	0.00	1.59
6. Minor Forest Produce	0.00	3.24
7. Area Oriented Fuelwood and Fodder Project Scheme	0.00	0.62
8. Seed Development	0.00	1.46
9. Integrated Wasteland Development Project (IWDP)	0.00	7.84
Total	218.90	219.23
Grand Total	295.00	250.98

* This includes Rs.27.43 crores as loans to the State Governments.

It would be seen from the above table that utilisation of Plan funds was to the extent of 85 per cent.

Break-up of the grants component of the above expenditure (Centrally sponsored schemes) alongwith areas of wastelands, State and Union Territory wise, has been given in Appendix-I to this Report. An analysis of the grants released indicates that ratio of grants received by a State to the total area of wastelands in that State varied widely from State to State. The average amount of grants released per hectare of wastelands in the country, during the Seventh Plan period, was Rs.14.66. Against the all India average of Rs.14.66, grants released per hectare of wastelands to Rajasthan was Rs.4.93 and to Sikkim Rs.93.69. With uniform guidelines and parameters for release of grants to the States, the wide variation indicates that the proportion of wastelands brought under afforestation under the schemes of the Board, to the total wastelands area in the State varied widely from State to State. States like Andhra Pradesh, Bihar, Kerala, Madhya Pradesh, Maharashtra and Rajasthan received grants below the all India average. Apprently, there is need for greater awareness in the States to avail of the facilities provided by the Board for reclamation of wastelands. The Board may organise greater interaction with them in order to elicit more attention and involvement especially in view of underutilisation of Plan funds earmarked for the important activity of reclamation of wastelands.

6.10 Excess and incorrect release of grants

6.10.1 Excess grants

Due to incorrect reporting, funds were released by the Board for various schemes, which were in excess of the amounts due as per the norms.

Himachal Pardesh: The State had reported plantation of 10671.33 hectares during 1985-88 under Rural fuelwood plantation scheme against the plantation of

10007.27 hectares as per brochure on forest plantation. The excess Central assistance claimed from the Board amounted to Rs 15.95 lakhs.

Karnataka: Against 1771.39 lakh seedlings raised under Decentralised people's nurseries scheme, during 1986-89, raising of 1827.46 lakh seedlings was reported and thus excess Central assistance of Rs.25.23 lakhs (at the rate of 45 paise per seedling) was obtained from the Board.

Madhya Pardesh : Against 1545 hectares of plantation actually covered in Bhopal, Indore and Ratlam districts during 1988-90 under Rural fuelwood plantation scheme, coverage of 3020 hectares was reported to the Board thereby claiming an excess Central assistance of Rs.44.08 lakhs. Similarly, against 149.75 lakh seedlings actually raised in seven social forestry Divisions during 1986-89, raising of 180.64 lakh seedlings was reported to the Board and excess Central assistance of Rs.13.90 lakhs claimed by the State.

The Ministry stated, in February 1991, that excess Central assistance had since been adjusted from the grants of subsequent years.

6.10.2 Incorrect grants

Central assistance of Rs.253.08 lakhs was released incorrectly as indicated below:

Himachal Pradesh : Rates laid down for afforestation under the scheme 'Operation Soilwatch' were inclusive of maintenance cost. However, Rs.9.29 lakhs on account of maintenance of 240 hectares under afforestation during 1987-88 were claimed (May 1988) from the Board though not admissible.

Madhya Pardesh : Against the admissible expenditure of Rs.43.72 lakhs, as per the norms, Bhopal, Indore and Ratlam districts incurred Rs.51.50 lakhs in 1987-88 on the plantation of 825 hectares under Rural fuelwood plantation scheme. Similarly, Bhopal district incurred Rs.15.40 lakhs in 1986-87 on plantation of 300 hectares against the admissible expenditure of Rs.14.40 lakhs. The excess Central assistance claimed worked out to Rs.4.39 lakhs.

Mizoram : The National Council of Applied Economic Research, New Delhi in their evaluation of the Rural fuelwood plantation scheme in the Sixth Plan period, conducted in 1988, had commented that there was no fuelwood shortage for the villagers in the State and implementation of the scheme in the State was not appropriate. Inspite of these observations, the Board released a sum of Rs.170 lakhs during 1988-90.

Uttar Pradesh : The component of farm forestry under which assistance was given by the Board for raising and distribution of seedlings free of cost was dropped from the Rural fuelwood plantation scheme in 1986-87. The Forest Department raised 419.63 lakh seedlings in 1986-87 at a cost of Rs.138.80 lakhs and obtained a Central assistance of Rs.69.40 lakhs which was not admissible.

The Ministry stated, in February 1991, that excess Central assistance to the States of Madhya Pradesh, Mizoram and Uttar Pradesh has since been adjusted from the grants of subsequent years.

6.11 Diversion of funds

Funds to the tune of Rs.189.77 lakhs were diverted to or utilised in works, which were not connected with the schemes.

Haryana : Divisional Forest Officer, Forest Division, Ambala purchased one fire tender valuing Rs.5.21 lakhs during 1988-89 under Operation Soilwatch eventhough the scheme did not provide for it.

Maharashtra : Out of Rs.933.81 lakhs released by the Board during 1986-90 for Decentralised people's nurseries scheme, the State Government incurred in Akola, Kolhapur, Nagpur and Nasik circles, expenditure of Rs.30.15 lakhs for transportation of seedlings, Rs.31.53 lakhs for their maintenance and Rs.28.82 lakhs on purchase of sprinklers and implements resulting in diversion of Rs.90.50 lakhs for the purposes not intended under the scheme.

Manipur : Central assistance of Rs.2 lakhs released to a Divisional Forest Officer during 1987-88 for Rural fuelwood plantation scheme was utilised under Economic plantation scheme by the Forest Department.

Orissa : In Rayagada Division, Rs.21.79 lakhs and Rs.39.29 lakhs were spent during 1985-86 on plantation of 1640 hectares and 2700 hectares of land under National Rural Employment Programme and Rural Landless Employment Gurantee Programme respectively. The amounts were kept under 'suspense head' and during 1986-87, the Division charged this expenditure to Rural fuelwood plantation scheme and obtained an assistance of Rs.30.54 lakhs though these two Divisions were declared fuel deficient in 1988-89 only. During 1986-90, an amount of Rs.69.45 lakhs, including Central assistance of Rs.34.18 lakhs, was spent by Chief Conservator of Forests to meet the cost of establishment of 191 staff who were not connected with the implementation of the scheme as the im plementation of the scheme had actually been entrusted to Orissa Plantation Development Corporation in 1985-86.

In Baripada Afforestation Division, sabai grass plantation over 125 hectares of land was raised during 1988-89 at a cost of Rs.3.11 lakhs under State plan scheme of commercial plantation. After release of

Central assistance under the scheme 'Minor Forest Produce Plantations', Orissa Plantation Development Corporation allowed the expenditure of Rs.3.11 lakhs to be charged to the Centrally sponsored scheme, thus diverting the funds to State plan scheme.

Uttar Pradesh : The scheme of raising of seedlings for free distribution under Rural fuelwood plantation scheme was discontinued from 1986-87. Allotment of Rs.13.20 lakhs was still made (1986-90) for raising seedlings in Jhansi Division. The Division spent Rs.13.10 lakhs on raising 18.97 lakh plants and maintenance of 78.83 lakh plants, though no provision was made in the scheme. An allotment of Rs.30 lakhs was made to Azamgarh Division during 1985-86 and 1986-87 for raising and maintenance of plants under Rural fuelwood plantation scheme. The Division incurred an expenditure of Rs.23.63 lakhs on raising and maintenance of 96.59 lakh plants. The remaining Rs.6.37 lakhs was invested on purchase of stock material. The Azamgarh Division sold 15.87 lakh plants to people during 1986-87 and 1987-88 for Rs.4.76 lakhs though the said scheme did not provide for sale of plants. The amount was utilised towards some other schemes instead of crediting it to the Centrally sponsored scheme.

6.12 Rural fuelwood plantation and afforestation of eco-sensitive non Himalayan areas

6.12.1 Outline of the scheme : The Seventh Plan scheme "Afforestation of eco-sensitive non-Himalayan areas" was combined in 1986-87 with another ongoing scheme of Sixth Plan namely "Social Forestry including Rural Fuelwood Plantation"(SFRFP) and the integrated scheme was called "Rural fuelwood plantation and afforestation of eco-sensitive non-Himalayan areas". SFRFP was initiated in 1980-81 in 101 fuelwood deficient districts and later extended to 157 such districts in 1982-83. This was largely a social forestry scheme with emphasis on fuelwood plantation and with farm forestry component, seedlings were raised and distributed free to the planters. The farm forestry component was dropped and a new component of soil and conservation works was introduced in the integrated scheme. But, the integrated scheme, was, implemented in the same set of districts which were earlier selected for SFRFP scheme. Thus, it may be seen that Board's scheme for regeneration of wastelands in the eco-sensitive non-Himalayan areas was being carried out in districts which were selected on the basis of fuelwood deficiency.

Central assistance was provided at the rate of 50 per cent of the estimated expenditure in respect of States and 100 per cent for Union Territories. The estimated expenditure per hectare was fixed by the Board from time to time. The cost norm for plantation on one hectare of land was Rs.4800 in 1986-87 which was revised every year and stood at Rs.6300 in 1989-90. The unit cost included expenditure on soil conservation works, maintenance of plantation and establishment. Number of plants to be planted in unit hectare was 2000 including not more than 500 plants from coppice, cuttings or seed.

6.12.2 Against the Seventh Plan outlay of Rs.108 crores, an amount of Rs.85.10 crores was released to States and Union Ter ritories upto 1989-90. The scheme was implemented through Forest Departments of State Governments and the progress was watched by the Board through quarterly progress reports. These reports did not indicate the details of districts, location and species planted and the Board had very little information about and control over the manner of implementation of the scheme.

The Ministry stated, in February 1991, "the State Governments were expected to implement the scheme as a model scheme as per the guideline and report its successful implementation. The result of the implementation is being evaluated by independent agencies, and modifications, if any, are being incorporated in the scheme on the basis of the evaluation."

6.12.3 Expenditure in areas not covered by the scheme:- The selection of districts to be covered under the scheme was to be made on the basis of dearth of fuelwood and the programme was to be implemented in the districts identified as fuel deficient by the Ministry of Agriculture and Rural Development. However, these conditions were not adhered to in the following cases resulting in unauthorised expenditure of Rs.394.73 lakhs.

Himachal Pradesh : The State Government incurred Rs.16.43 lakhs on plantation in three non-identified districts (Bilaspur:Rs.4.97 lakhs, Solan: Rs.11.43 lakhs and Una: Rs.0.03 lakh) during 1985- 90.

Maharashtra : Instead of selecting fuel deficient districts, one fuel sufficient district, Sindhudurg was selected for operation of the scheme and the State Government incurred an expenditure of Rs.25.84 lakhs during 1985-90 for plantation in a fuel sufficient district.

Nagaland : The Ministry introduced the scheme in three chronically fuel deficient districts, i.e, Kohima, Phek and Tuensang. The State Government, however,

spent the funds meant for the scheme, in all its seven districts since 1985-86. During 1985-90, the Forest Department incurred an expenditure of Rs.277.48 lakhs on four districts not covered by the scheme.

Punjab : The State Government spent an amount of Rs.57.55 lakhs during 1987-88 for plantation in three districts. These districts were not cleared by the Ministry for implementation of the scheme.

Uttar Pradesh : Although no provision was made for the operation of the Rural fuelwood plantation scheme in Uttar Kashi district, a sum of Rs. 17.43 lakhs was spent during 1987-89.

The Ministry stated, in February 1991, that apart from the fuelwood deficit districts identified by the Board, State Governments had also identified some other districts as fuelwood deficient. In order to ensure that the scheme was implemented in only fuelwood deficient areas,all the State Governments had been asked to report such areas before the expenditure could be sanctioned.

6.12.4 Plantation of non-fuelwood species:- Under the scheme fast growing fuelwood species suitable to the locality were to be planted on community land and wastelands. The preference for fast growing species over the plantation of timber value was given in consideration of the fact that plants of fast growing nature could be ready for harvesting at the end of the eighth year so that the fuelwood would be available to the rural poor early. However, species planted had more timber value and were slow growing species which did not conform to the objectives of the programme. Planting of trees of commercial value further exposed the land to the threats of commercial exploitation.

Madhya Pradesh : In Durg district, teak trees were planted in 275 hectares during 1985-87. Similarly in Raipur Territorial Division, non-fuelwood species, viz., Termanalia arjun plants were planted in 50 hectares of land during 1988-89.

Maharashtra : The Social Forestry Department undertook the plantation of cashewnut, tamarind and teak having more commercial value. The expenditure incurred on these plantations was not available.

Manipur: Out of 1240 hectares of plantations done in 20 plantation centres, pines and eucalyptus were planted over 1190 hectares in 19 plantation centres.

Orissa : In Berhampur, Bhawanipatna and Rayagada Divisions, 33.71 lakh trees of non-fuelwood species like teak, siso, sal, mango, guava and cashew were planted during 1986-87 and 1988-90 at a cost of Rs.37.50 lakhs on 2107 hectares of land.

Punjab : Out of 139.72 lakh trees planted in Amritsar, Ludhiana and Patiala districts, 46.84 lakh trees were either ornamental or had more timber value than fuel. The cost of these plantations worked out to Rs.157.07 lakhs (Amritsar: Rs.98.61 lakhs, Patiala: Rs. 46.17 lakhs and Ludhiana : Rs.12.29 lakhs).

Uttar Pradesh : In Almora, Pauri and Uttar Kashi Divisions, out of 2003.75 hectares of land planted under the scheme, slow growing species puil (chir) was planted in 1254.25 hectares at a cost of Rs.52.81 lakhs.

The Ministry stated, in February 1991, that a rigorous monitoring of species planted was being done in order to ensure that the species planted yield more of fuel wood even if they have multiple uses and quick growing nature.

6.12.5 Avoidable/wasteful expenditure :- During the test check in some of the States it was noticed that avoidable expenditure to the tune of Rs.20.66 lakhs was incurred for advance work on land on which no plantation was subsequently carried out.

Madhya Pradesh : In Bilaspur, Bhopal and Durg districts, 11.41 lakh pits and 3092 contour trenches were dug during 1986-90 on 790 hectares of land at a cost of Rs.6.45 lakhs and Rs. 0.13 lakh respectively. The actual plantation was, however, carried out in 9.94 lakh pits, thus rendering an expenditure of Rs.0.81 lakh as wasteful on digging 1.48 lakh pits. With a view to effecting economy in plantation, the Chief Conservator of Forests prescribed (May 1982) size of pit for plantation of fuelwood species as 30x30x30 centimetres. However, during 1986-89 five lakh pits of size 45x45x45 centimetres were dug in Ratlam district at a cost of Rs.3.55 lakhs resulting in an extra expenditure of Rs.2.49 lakhs.

The Ministry stated, in February 1991, that it was being ensured that the planting work is carried out wherever advance work has been done.

Meghalaya : Against the advance work on 11073 hectares of land done during 1985-89 the corresponding plantation in the following years (1986-90) was done in 10556 hectares. Thus, no plantation was done on 517 hectares of land till 1989-90 though the advance work had been completed at a cost of Rs.7.59 lakhs. The Department attributed this to lack of funds and stated that left over area would be covered in coming years. The Ministry stated, in February 1991, that the State Government has been asked to ensure plantation in such areas at the earliest.

Mizoram : As per progress report for the year 1985-86 submitted to the Board, advance work was carried out on 5100 hectares of land at a cost of Rs. 38.25 lakhs.

Against this 3797 hectares of land was planted during 1986-87 and no further plantation was undertaken during subsequent years. Thus, expenditure of Rs.9.77 lakhs for taking up advance work on 1303 hectares of land had become wasteful. The Ministry stated, in February 1991, that while sanctioning expenditure during a particular year, the amount already sanctioned towards advance work is taken into account.

6.12.6 Other points: The Rural fuelwood plantation scheme envisages that seedlings required for plantation have to be obtained from decentralised people's nurseries. Under the scheme, 179.22 lakh seedlings (2000 seedlings per hectares) were required for plantation of 8961 hectares of land during 1986-87 to 1989-90 in Karnataka. These seedlings were procured departmentally. If these seedlings had been procured from nursery growers, under the decentralised people's nurseries scheme, it would have fetched an income of Rs.89.61 lakh to the rural people. The Forest Department stated that due to non-availability of these nurseries in the vicinity of rural fuelwood plantation area and lack of appropriate seedlings in these nurseries, the seedlings were not procured from nursery growers. The contention of the Department is not correct as nurseries raised in rural areas and species raised were generally silver oak and casuarina etc., which could be obtained from nursery growers.

The Ministry stated, in February 1991, that the State Governments were using seedlings available nearest to the planting site to keep the cost of raising plantation within the prescribed norms.

In Madhya Pardesh, in Indore district, 900 hectares of plantation allotted under Rural fuelwood plantation scheme during 1985-86 was carried out by Territorial Division, Indore (200 hectares) and Social Forestry Division, Indore (700 hectares). The expenditure incurred, on 700 hectares by Social Forestry Division was, however, charged and intimated to Chief Conservator of Forests under the scheme US-AID. As the expenditure on 700 hectares was also shown by Chief Conservator of Forests (Development) in the achievement of the year 1985-86 and reported to the Board , the claim of grant of Rs.7 lakhs overlapped between the two schemes.

The Ministry stated, in February 1991, that the Government of Madhya Pradesh was requested to look into the matter and furnish their report and that it would be the endeavour of the Board to avoid such instances in future.

In Uttar Pradesh, in Agra, Almora, Azamgarh, Lalitpur, Mirzapur, Pauri, Uttarkashi and Tehri districts, the departmental plantation was carried out in 7135 hectares of reserve forest areas at a cost of Rs. 258.03 lakhs, even- though the scheme did not provide afforestation in reserve forest area.

The Ministry stated, in February 1991, that as these reserve forest areas were closer to villages, basic objective of providing fuel wood and fodder had been achieved. In that case it will be difficult to protect the reserve forest areas from unauthorised felling of trees.

6.13 Decentralised people's nurseries scheme

6.13.1 Outline of the scheme:- The scheme of decentralised people's nurseries was introduced in 1986-87 with the objective to produce maximum possible seedlings through people's participation. The scheme envisaged making locally available seedlings of desired species in adequate number. The scheme aimed at setting up village nurseries, each producing 25000-50000 seedlings with the help of small farmers, schools, women groups, voluntary agencies and cooperatives. The subsidy of 45 paisa per seedling was to be paid in cash and kind to nursery persons by the Forest Departments of State Governments. The species to be raised was to be decided jointly by the Forest Department and the nursery owner on the basis of the local requirements. On seedlings being ready, the Forest Department was to inspect and determine the number of good quality seedlings for making payment of subsidy. The involvement of the Forest Departments under the scheme was upto the level of raising seedlings only and nursery owners were to market the produce at the prevailing rates but in no case at less than the price the Government nurseries were charging for the seedlings. The unsold seedlings were to be taken by the Forest Department after adjusting the price at the rate of 45 paise per seedling against the subsidy originally given to the nursery owners.

6.13.2 This scheme was funded by the Board at the rate of 100 per cent of the estimated expenditure to be released to the States and Union Territories. Against the Seventh Plan outlay of Rs.47.90 crores, the expenditure amounting to Rs.55.82 crores had been incurred by the Board upto 1989-90.

6.13.3 The test check conducted in different States revealed that there were certain inherent deficiencies. The nursery owners could not market the seedlings on account of lack of demand. Most of the seedlings were either picked up by the Forest Departments or became

useless by becoming oversized. Often the Forest Departments lifted the seedlings after the plantation season had already ended. Forest Departments were also distributing seedlings free to the planters making the marketing task even more difficult for the nursery owners. Also, the terms at which the Forest Departments promised to lift the unsold seedlings did not provide enough motivation to the nursery owners to intimate the Forest Departments about the unsold seedlings in time.

The scheme has a strong forward linkage with the afforestation activities being carried out in an area. However, it was noticed that the Board while approving the demands and targets furnished by a State did not assess the requirements of the seedlings on the basis of targets or scientific projection of the volume of afforestation to be carried out by other departments and agencies. Similarly, the Forest Departments also did not carry out scientific assessment of areawise demands for seedlings.

Accepting the facts, the Ministry stated, in February 1991, that an evaluation of the scheme in some States, conducted at the instance of the Board, revealed **inter alia** that (i) many States have continued free distribution of seedlings in disregard of the guidelines, (ii) seedlings production in the nurseries was not need based and as a result surplus seedlings could not find proper outlets/use, (iii) quality control was not given proper attention and (iv) training and extension activity was neglected. The Ministry added that a modified scheme has been prepared and sent to the Planning Commission and the Plan Finance for approval.

6.13.4 Damaged seedlings/unutilised seedlings:- A test check of records revealed that seedlings were damaged/remained unutilised in the following cases resulting in loss of Rs.159.70 lakhs as indicated below-

Karnataka : Out of 1827.46 lakh seedlings raised during 1986-89, 193.19 lakh seedlings valuing Rs.86.93 lakh remained unutilised (May 1990).

Madhya Pradesh: Records of Chief Conservator of Forest (Social Forestry), Madhya Pradesh revealed that 138.51 lakh seedlings raised during 1986-89 remained unsold at the close of March 1989 on the ground that the seedlings were not in demand in the market. The seedlings were also not gainfully utilised in departmental plantations. As a result, the subsidy of Rs. 62.33 lakhs paid for the unutilised stock had gone waste.

Mizoram : Although 25.92 lakh seedlings were raised during 198687, nothing could be marketed by the nursery owners as public were not interested in the scheme as reported by the Forest Department. The Department, lifted 7.36 lakh seedlings leaving out the balance 18.56 lakh seedlings at nursery stock. Thus, the objective of the scheme that the nursery owners should get the additional remuneration from the sale of seedlings could not be fully achieved.

Orissa : Out of 104.51 lakh seedlings raised during 1986-89 by the people's nurseries in seven Divisions, 26.36 lakh seedlings were damaged, the cost of which worked out to Rs.10.44 lakhs. Divisional Forest Officer stated that there was less demand for the seedlings by the local people and there was no provision of funds for their maintenance.

6.13.5 Free distribution of seedlings/sale at subsidized rate:- One of the necessary conditions of the scheme was that there would be no free distribution of the seedlings in areas where nurseries have been raised. A test check of the records revealed that in the following States,seedlings were distributed free of cost contrary to the guidelines of the scheme:

Karnataka : It was seen that the entire 21.18 crore seedlings raised during 1986-90 at a cost of Rs.9.38 crores with full Central assistance were either distributed free of cost to the public or taken over by the Forest Department and the seedlings raised by the rural people were not marketed as planned in the scheme.

Maharashtra : During 1986-87, the State Government supplied seedlings to the public free of cost and thereafter at a subsidized rate of 20 paise per poly pot seedling during Van- mahotsava programmes. As minimum sale price of seedling fixed under the scheme was 45 paise, sale at subsidized rates made seedlings from the nurseries incompetitive and only 1350.54 lakh seedlings could be sold by the nursery persons. The Department also purchased 409.22 lakh seedlings at the cost of Rs.81.84 lakhs requiring further expenditure of Rs.30.15 lakhs on their transport and Rs.60.35 lakhs on maintenance. The free/subsidized sale of seedlings during Vanmahotsava resulted in avoidable expenditure of Rs.172.34 lakhs.

The Ministry stated, in February 1991, that free distribution of seedlings was made in accordance with the direction issued by the Government of Maharashtra for Vanmahotsav. However, the Government of Maharashtra had issued direction to all departments to purchase seedlings only through decentralised people's nurseries.

Manipur : During 1986-87, 12.39 lakh seedlings were raised by three Forest Divisions through 30 nurseries. The seedlings were taken over by the Forest

Department and 10.79 lakh seedlings were distributed to the public free of cost. The remaining 1.20 lakh seedlings were utilised for their own plantation and 0.40 lakh remained unutilised.

Orissa : In Bhawanipatna and Puri Divisions, 12.81 lakh seedlings were distributed free to the public. The Divisional Forest Officers could not produce any records in support of actual plantation of the seedlings by the persons to whom seedlings were distributed free. This irregular distribution of seedlings resulted in wasteful expenditure of Rs.5.00 lakhs.

West Bengal : Out of 321.50 lakh seedlings raised during 1986-87, 75.9 lakh seedlings valuing Rs.34.16 lakhs were distributed free of cost to the public by nursery persons (including 12.10 lakh taken over by Forest Department).

6.13.6 Raising of school nurseries :- While allocating the funds for 1987-88, instructions were issued (May 1987) by the Board that 30 per cent of the grant should exclusively be spent on school nurseries so that students got involved in social forestry programme at a young age. But the said instruction was ignored in the following cases as revealed during test check of records:-

Gujarat : The Forest Department had not maintained records to show beneficiarywise expenditure and output of the nurseries, i.e., kissans, schools, women, youth groups and tribes etc. The information from the Department revealed that school nurseries constituted only 14 to 17 per cent of the total nurseries raised upto 1989-90.

The Ministry stated, in February 1991, that raising school nurseries suffered from certain constraints such as lack of care during vacations and absence of enough land and water facilities. They were , therefore, trying to motivate residential schools to participate in the scheme.

Maharashtra : School nurseries were not set-up in Auarangabad, Kolhapur, Nagpur and Nasik circles. The Forest Department attributed this to lack of water sources, non-availability of land with the schools and reluctance of schools to take up nursery.

The Ministry stated, in February 1991, that out of the 4228 nurseries raised in the State, 406 were school nurseries and 22 nurseries were raised in Kolhapur. In rest of the districts, schooi nurseries could not be raised due to non-willingness of the school for want of water sources and non-availability of land with the schools.

Mizoram : The seedlings were raised only in private nurseries after selection of nursery owners by the Department.

Orissa : As per information furnished by the Orissa Plantation Development Corporation (June 1990) only 19 and 12 per cent of the grants under the scheme were utilised for school nurseries in the year 1987-88 and 1988-89 respectively and the balance was used in people's nurseries. Divisional Forest Officer attributed this to the summer vacation and poor response from schools to undertake nursery work.

Punjab : Out of the expenditure of Rs.15.97 lakhs incurred in six test checked Divisions, only a sum of Rs 1.94 lakhs (12 per cent) was spent, against the prescribed norm of 30 per cent, in raising school nurseries during 1987-88.

6.13.7 Raising of nurseries by the department:- The scheme did not envisage raising of nurseries departmentally and as such the expenditure did not qualify for Central assistance. Seedlings valuing Rs.41.18 lakhs were raised departmentally.

Orissa : In Puri Afforestation Division, 3.48 lakh seedlings were raised departmentally in seven nurseries in 1988-89 at a cost of Rs.1.22 lakhs. The Divisional Forest Officer attributed raising the seedlings departmentally to the people's apathy.

Meghalaya : Out of Rs.41.95 lakhs allocated by the Board during 1986-89 for decentralised people's nurseries, Rs.39.96 lakhs were spent by the State for raising departmental nurseries.

6.13.8 Size of nurseries : The scheme envisaged setting up village nurseries, each producing 25,000 to 50,000 seedlings through small farmers, schools, womengroups, voluntary agencies and cooperatives. During test check it was found that the nurseries were not being set up according to the prescribed size, resulting in either unviable units or lopsided distribution of benefits.

Maharashtra : In four districts, it was noticed that nurseries set up during 1986-90 were to raise, on an average, 10,000 seedlings and in certain cases as low as 2000 to 5000 seedlings. Sixty five to seventy per cent beneficiaries backed out every year. The department stated that less targets were fixed to accomodate more beneficiaries. The lowering down of the production target was contrary to the objective of providing gainful employment as it undermined the economic viability of the nurseries.

Manipur : In two Forest Divisions, eight nursery persons were selected, during 1986-87, to raise more

than maximum limit of seedlings varying from 50171-96700 seedlings.

West Bengal : 78 nurseries in three districts were found to produce 2500 to 10,000 seedlings. The norms were modified by the State Government in the operational guidelines as 10,000 to 20,000 for eligibility verification.

The Ministry stated, in February 1991, that lower targets were fixed keeping in view the capacity of the marginal or landless farmers to provide land and water.

6.13.9 Other points :- In Himachal Pradesh, the identification of small and marginal farmers and rural poor was not conducted under the scheme and no separate nurseries were raised. State Government financed the existing kissan nurseries and entire expenditure of Rs 100.48 lakhs for 1987-90 was incurred on kissan nurseries without the approval of the Board. Thus, it was not ensured that the scheme benefitted the small and marginal farmers and rural poor.

During 1987-90, 28.44 lakh seedlings were purchased by 11 Forest Divisions from kissan nurseries at different rates fixed by respective Conservators of Forests and entire cost was met out of the funds of 'Umbrella project'. On receipt of Central assistance under Decentralised people's nurseries, a sum of Rs.21.49 lakhs was charged to the scheme instead of Rs. 12.80 lakhs chargeable as per norms, at the rate of 45 paise per seedling, resulting in excess debit of Rs.8.69 lakhs to the scheme.

6.14 Establishment of silvi pasture farms

6.14.1 Outline of the scheme :- The scheme was started in 1986-87 as a Centrally sponsored scheme with the objective of making available nutritious grass and fodder at reasonable price in rural areas. The scheme envisaged raising of fodder trees, shrubs, legumes and grasses on degraded land of marginal/submarginal farmers. Improvement of living conditions of the rural poor through additional income by sale of the produce was also contemplated. Central assistance under the scheme is given to the State Governments at 50 per cent of the reckoned cost subject to a ceiling of Rs.1250 per hectare. The assistance under the scheme is also given to non-government organisations.

6.14.2 The scheme was operated in Karnataka and Orissa during 1986-87. It was extended to West Bengal in 1987-88. During 198990, it was under implementation in Andhra Pradesh, Gujarat, Karnataka, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal. Against the Seventh Plan outlay of Rs.13 crores, the grants released under the scheme to various State Governments and private organisations like National Dairy Development Board (NDDB) amounted to Rs.3.50 crores. As the scheme did not prove popular, it was merged with another scheme namely "Fuelwood and fodder project scheme" from Ist April 1990, specially for incorporating an area approach.

6.14.3 Orissa : Though the scheme aimed at making available adequate quantity of better quality cattle fodder at a reasonable price to the dependent rural areas, it was seen from the records that the Forest Department did not evolve any mechanism for sale of grass and grass seeds, legume and leaf fodder etc. No instruction was issued to the Divisions for ensuring harvesting of the grass and legume and their sale. As a result, no protective measures were taken by the Divisions by engaging watch and ward and the silvi pasture farms were allowed to be browsed and grazed by the local cattle. According to the cost model circulated by the Board, in November 1987, to the State Government, the expected income from the silvi pasture produce should be Rs.650 per hectare in the first year of operation and Rs.960 per hectare in the second year of operation.

During 1986-87 and 1987-88, taken as preliminary years of operation, silvi pastural farms were raised on 264.50 hectares and 500 hectares respectively in Orissa and as per cost model issued by the Board the expected income was to be Rs 7.52 lakhs. However, grass and legume could not be sold.

The Ministry stated, in February 1991, that while there were certain expectations about income generation, collection of produce without payment by the villagers, for their bonafide needs, could not be ruled out.

6.14.4 West Bengal : The Conservator of Forests, Social Forestry, South Circle, West Bengal fixed the yield rate of ten tonnes per hectare as the standard for fodder. In the operational guidelines, plantation yielding less than the fixed norm was to be treated as failure. It was noticed that the yield rate of fodder in respect of 733 hectares of land in Bankura, Burdwan and Midnapur districts covered in 1988-90 were between three and 6.7 tonnes per hectare. The shortfall in the yield rate was attributed to poor soil condition, biotic interference and vagaries of nature. The plantations were thus failure and resulted in nugatory expenditure of Rs.18.63 lakhs of which Central share was Rs.9.32 lakhs.

The Ministry stated, in February 1991, that the loss thus suffered should be treated as notional as they were attributable to natural causes.

Although the silvi pasture farms were to be established on lands owned by the farmers, test check of records revealed that out of 206 hectares of land brought under the scheme in 1989-90 in Burdwan, Hooghly and Purulia districts of West Bengal, 166 hectares belonged to the Forest Department. The deviation resulted in an inadmissible expenditure of Rs.4.15 lakhs of which Central share was Rs.2.08 lakhs. Accepting the fact the Ministry stated, in February 1991, that although prime aim of the scheme was to augment fodder production, such instances would be avoided in future.

6.14.5 Karnataka : Although the scheme was to be implemented in backward rural poor and mostly tribal areas to provide adequate quantity of quality fodder with people's participation and to supplement people's earnings, an amount of Rs.64.77 lakhs was released (March 1987) to the Karnataka Forest Development Corporation for development of farmland in 4000 hectares. The estimated cost of Rs.129.54 lakhs for the two years (of which 50 per cent share was released by the Board in advance) included Rs.48 lakhs towards the cost of drilling 100 borewells. Progress of work was not reported by the Corporation till July 1988. In the progress report for August 1988, the Corporation informed the Board that 54 borewells had been drilled and 74.41 hectares of land had been developed at a cost of Rs.38.18 lakhs. The Corporation further informed that target of development of 4000 hectares of land was unmanageable due to non-participation of villagers and hence submitted a revised project proposal of covering 1205 hectares during a period of four years. A scrutiny of the report revealed that the cost of development of the land was only Rs.6.10 lakhs and the balance was spent on creation of capital assets or payment of salary and wages of staff, which was not permissible under the scheme. The Corporation was actually entitled to receive only Rs.0.93 lakh for 74.41 hectares of land at Rs.1250 per hectare. The amount of Rs.63.84 lakhs had thus been paid in excess. The Ministry stated, in February 1991, that action was being initiated to resolve the issue with the Government of Karnataka.

6.14.6 National Dairy Development Board: Grants amounting to Rs.112.50 lakhs were released to National Dairy Development Board(NDDB) during 1987-88 for development of 9000 hectares of land under the scheme. But, till March 1989 only 4095 hectares of land had been developed. NDDB had expressed difficulties in getting the land for implementation of the scheme. In March 1989, NDDB had an unspent grant of Rs.67.31 lakhs, out of Rs.112.50 lakhs released during 1987-88. No further progress report and utilisation certificates were furnished by NDDB to the Board. The Ministry informed, in February 1991, that the National Dairy Development Board had utilised the amount but the formal utilisation certificate was awaited.

6.15 Minor forest plantation scheme

On receipt of Central assistance of Rs.32.70 lakhs in two instalments (November 1988 and March 1989), under the Minor forest plantation scheme, the Conservator, Social Forestry, Meghalaya sanctioned the amounts to all the Divisions in March 1989 for doing advance work on 2500 hectares during 1988-89. The scheme was not even known to one Division (Tura) till March 1989. The Division was asked to undertake advance work on 237 hectares and was sanctioned Rs.4.58 lakhs on 30th March 1989 to complete the work by 31st March 1989. Though there was nothing on record in the Tura Division to show that any prior survey and selection of area for such advance work for plantation was done, a sum of Rs.4.53 lakhs was shown to have been spent on 31st March 1989.

The Ministry stated, in February 1991, that the Principal Chief Conservator of Forests had given details of the plantations done in Tura Division. However, audit observations were being communicated to the State Government for their comments.

6.16 Grants-in-aid to voluntary agencies

6.16.1 The scheme of grants-in-aid to voluntary agencies was initiated during 1985-86 with a view to involve non-government organisations in the process of development of wastelands with people's participation. The scheme was drawn up to cover the activities directly connected with afforestation, i.e., nursery raising, afforestation training programmes, evaluation studies etc. Priority was to be given (i) for establishment of decentralised nurseries and school nurseries; (ii) for block plantation specially on community land and lands belonging to Scheduled Castes and Scheduled Tribes people living below the poverty line; (iii) to pasture development through the people's institutions and the people's involvement and (iv) for assistance in implementation of tree patta schemes.

The proposals for voluntary agencies are got appraised by the Social Forestry Department in the States or by nearest available consultants. Evaluation of the projects is also got done through State Forest Departments and other non- official consultants.

6.16.2 During 1985-90, an amount of Rs.20.48 crores was released by the Board as grants to voluntary agencies in respect of 336 projects.

6.16.3 In Gujarat, a project for raising and planting seedlings (project cost: Rs.39.36 lakhs) was implemented by Rural Labour Association Bardoli. Similarly, another project for raising and plantation of seedlings (project cost: Rs.49.07 lakhs) was implemented by Halpathi Sewa Sangh, Bardoli, Surat District. Evaluation of the two projects by the Forest Department (June 1989) revealed that out of the 23 to 37 per cent of seedlings raised in two districts and distributed, only seven to eight per cent of seedlings raised were surviving. Similarly, nine to fifty four per cent of the seedlings raised by another agency were surviving.

The Ministry stated, in February 1991, that they were not aware of any such evaluation by the State Government although the report submitted by the Operation Research Group found the activities to be satisfactory except for Soil and Water Conservation measure.

In Rajasthan, during 1985-86, a grant of Rs.18.18 lakhs was released to an organisation called Sewa Mandir, Udaipur for development of privately owned wastelands. The agency was to execute the project through 2000 farmers, each planting 500 trees on their own private wastelands. According to the report of the Assistant Inspector General of Forests at the Board, only 7.81 lakh trees had been planted against the target of 10 lakh of which only 3.74 lakh trees survived due to faulty planting technique and lack of aftercare. The health and vigour of the surviving plants was also not satisfactory. The unspent balance of Rs.2.33 lakhs had also not been refunded to the Board.

In Tamil Nadu, for afforestation and wastelands development of 400 hectares of land, the Board approved a project, in 1986-87, involving an outlay of Rs.30.73 lakhs to be implemented by Irula Tribal Women's Welfare Society, Madras over a period of three years. An amount of Rs 9.10 lakhs was released by the Board as grants-in-aid to the agency in January 1987 although the land which was identified for plantation was not owned by the agency. Only 147.4 hectares of land was obtained by the agency during 1988-89 and it reported utilisation of Rs.10.76 lakhs for developing 140 hectares of land by December 1988. The project implementation had not been evaluated by the Board so far.

The Ministry stated, in February 1991, that a mid-term evaluation was reported to have been carried out.

6.17 Poor survival of plants/ unsuccessful plantation

According to the instructions of the Ministry of Agriculture (Department of Agriculture and Cooperation) issued in May 1983 to all States and Union Territories, normally a successful plantation must have atleast 75 per cent survival. During test check of records the survival rates of the plantations were found to be poor as mentioned below:-

Haryana : In Saraswati and Pesowa ranges of Kurukshetra district, plantation in 385.90 hectares out of 498 hectares was unsuccessful resulting in loss of 6.41 lakh plants valuing Rs.2.89 lakhs.

Orissa: In Balasore, Cuttack, Dhenkanal, Ganjam, Puri and Rayagada Divisions survival of plantations during 1985-89 ranged from 15 to 72 per cent. The survival in respect of plantations done in four Divisions during 1986-87 ranged from 15 to 55 per cent whereas among plantations done in 1987-88 in five Divisions, the survival ranged between 40 and 70 per cent and in respect of plantations carried out in two Divisions during 1988-89 the survival rate was from 58 to 72 per cent.

In six Divisions viz Balasore, Berhampur, Cuttack, Dhenkanal, Puri and Rayagada the survival of fodder plantations during 1986- 90 under Silvi pasture scheme ranged upto 63 per cent.

Uttar Pradesh: In Agra Division, average rate of survival assessed by Conservator of Forests, in December 1989, in respect of 369.80 hectares of plantation carried out during 1986-87 and 1987-88 at a cost of Rs 3.71 lakhs was 39 and 16 per cent respectively. In five blocks consisting of an area of 186.40 hectares, plantation done during 1985-87 and 1989-90 at a cost of Rs.2.17 lakhs totally failed due to sandy soil, white ants and drought.

West Bengal : The average survival rate in silvi pasture farms in West Bengal had been estimated by its Forest Department to be between 60 and 95 per cent. However, test check revealed that the actual survival rates in farms established in the villages Bheria (1987-88) Beldeh, Bhagbandh, Gayalagara, Nutandih, Rehard, etc (1988-89) in Purulia district were 10 to 40 per cent.

The Ministry contended, in February 1991, that the main aim of the project was to create replicable model

and were likely to meet with either moderate or partial success which depended upon the quality of land and agro-climatic factors.

6.18. Participation of local people

One of the objectives of the scheme is to create a people's movement for afforestation activities as against mere wage earning in plantation work. This is due to the realisation that afforestation effort could not succeed without active participation of the public. But on test check it was noticed that people's involvement in the implementation was limited to formation of committees and wage earning.

In Karnataka, it was seen that Rural fuelwood plantation scheme had been implemented departmentally and no afforestation programme had been carried out by involving private agencies. It was stated by the State Government that local rural labour had been involved thereby generating employment of about 61 lakh mandays.

In Orissa, test check of records of seven afforestation Divisions of the State revealed that no village level implementation committee was formed by any of the Divisions. Thus, in the absence of formation of committees the objectives of Rural fuelwood plantation scheme of involving the people for better survival and protection of plants and inducing them to take up plantation on their own was not achieved.

In Punjab, under Rural fuelwood plantation scheme, social forestry wings of the State were to associate local organisations like panchayats, voluntary organisations, women's group etc. in fuelwood and fodder plantation on voluntary basis rather than as a departmental effort. No records were maintained in four Divisions of Punjab to show the extent to which people were involved in the scheme and plantation raised. In two Divisions, the local people were not involved in the implementation of the scheme 'Operation Soilwatch' and no soil conservation measures were undertaken by the villagers/farmers.

In Sikkim, protective works were executed through panchayat nominees (contractors) and afforestation, benching and pasture development were done departmentally engaging local people.

In West Bengal, people's involvement in the implementation of the schemes was limited to formation of protection committees. Motivation activities were done by District Officers through film and slide shows. No mechanism was worked out to direct the flow of benefits and distribution of intermediate and final produce to local people who were envisaged in guidelines for encouraging people's participation. Soil Conservation Division (North), Jalpaiguri and Halimpony Soil Conservation Division stated that people's participation was being secured only through employment.

6.18.2 There was little progress towards building up a people's movement. The Departments adhered to their normal or traditional methods of work and this had failed to evoke enthusiasm. There had been little realisation that fuel and fodder shortages could grow to critical dimensions and result in over-exploitation of the environment and eventually lead to ecological crisis. There was inadequate understanding of the importance of fodder grown locally for local needs. Tree species for plantation were generally chosen by the Departments with little regard to what the local communities would need and most often on the basis of what was readily possible. Even in the fourth year of the Seventh Plan, it was commonly found that Departmental nurseries did not raise planting stock of the species which were in demand by the local people. This is a reflection of the failure of the official machinery to get together and work with local communities and organisations.

The Ministry stated, in February 1991, that 'the procoess of people's participation is gradual and is expected to be achieved in stages'. It added that the Board constantly evaluates the schemes in the States to ascertain the level of people's participation. Also the Board provides various fora for exchange of views by holding workshops, seminars, etc.

6.19. Monitoring and evaluation

The Board is to act as a nodal point for monitoring various programmes related to afforestation and wastelands development. In November 1985, the Board decided to create a monitoring and evaluation cell to be manned by consultants with necessary skill and training in data processing and micro computer use and qualitative research methods for co-ordinating and managing studies and undertaking periodical review of progress of afforestation. Accordingly, computer cells were set up in 27 States/Union Territories upto the end of March 1990. Twenty nine training programmes were also organised upto March 1990 for imparting training to the field staff regarding collection and reporting of data under the computerised system. An amount of Rs.51.00 lakhs was spent by the Board during 1986-90 on setting up of computer based monitoring cells.

Inspite of the considerable investment in monitoring and evaluation system, the aim of timely receipt of detailed information was not achieved. The reports fur-

nished by the State units continued to present information in the traditional way and broadly indicated the physical achievement. The Board was, thus, deprived of crucial detailed information like the socio-economic status of beneficiary, species of tress planted, income generated through sale of seedlings and fodder etc. There was no mechanism to detect and check misreporting of achievement. The Board was also not in a position to review their plan according to the results because the reports presented only the very broad parameters such as area afforested, number of seedlings raised and expenditure.

Andhra Pradesh : Monitoring and evaluation was not done in Andhra Pradesh though a special cell existed for this purpose in the Forest Department.

Arunachal Pradesh : No separate monitoring and evaluation cell was set up (June 1990). The progress of the schemes was being monitored through the periodical reports received from the Divisional Forest Officers and the consolidated reports were being furnished by the Principal Chief Conservator of Forests to the Board.

Two computers were given to the State by the Board free of cost, in July 1987, with a view to coordinating and undertaking periodical review of progress of afforestation, mortality rates, survival rates etc. From the date of installation (July 1987), the computers were not utilised for compilation of various reports, returns or for monitoring purposes for which the computers were given by the Board.

Gujarat : The work is being attended by monitoring cell of the Forest Department in addition to other works relating to State schemes. No specific reports/returns were prescribed by the Department in respect of these schemes. There were no records to ensure periodical receipt of information.

Karnataka: The success of the schemes was discussed in the meeting conducted by the Department with the unit officers and also discussed in Karnataka development programme/ monthly multi level meetings conducted at taluk level and State level. Besides these meetings, physical verification at the field level was also done during the visit of field officers to the nurseries and plantations and their remarks recorded in the nursery register (plantation journals maintained in the range offices). No separate evaluation has been done by the Department other than in the meetings and inspections to assess the success of the schemes.

Madhya Pradesh : A computerised monitoring cell was set up in 1986-87 and an amount of Rs.2.14 lakhs was spent on that. The activities of production and distribution of saplings, rehabilitation of degraded forest lands, plantation along railway lines, roadside and canalbunds, survival rate among old and new plantations, people's participation in plantation effort were proposed to be monitored through the cell. However, the unit had not become functional (January 1991). Only a training programme in five districts was carried out during 1989-90. It was stated that software packages developed by CMC Limited was under revision. The Chief Conservator of Forests stated that work under various schemes is reviewed periodically through progress reports received from field offices. The reports, however, lacked the requisite information on the basis of which the progress of schemes could be effectively reviewed/ evaluated.

Maharashtra : No monitoring cell was created in Maharashtra.

Manipur: A cell was functioning under Deputy Conservator of Forests. In February 1989, Forest Department constituted monitoring committee headed by one Divisional Forest Officer who submitted an assessment report in March 1989. In July 1989, the State Government appointed five officers of the Forest Department to look after the progress and achievement of tree plantation covering the whole area of plantation. But, no report could be made available to Audit.

Meghalaya: No special cell for monitoring and evaluation of the schemes was set-up though Rs.1.07 lakhs had been shown as expenditure incurred on monitoring cell in the progress report of Rural fuelwood plantation scheme furnished by the State to the Board.

Mizoram : There is no separate monitoring cell in the Forest Headquarters. Maintenance of records relating to schemes by the statistical wing of the Department is far from satisfactory as most of the information like survival rates of the plantations, seedlings stock in the nurseries, category of the areas (forest land, community land) covered or being taken up districtwise etc. were not made available to Audit. No evaluation of the schemes had been done for the Seventh Plan period, although as per progress reports an amount of Rs.9.68 lakhs was spent during 1986-87 on the monitoring cell.

Orissa : The Forest Department did not reply to the Audit query as to the number of staff entertained for setting up/strengthening the monitoring cell, the amount of Central grants received/spent on the same and if the implementation of any of the Centrally sponsored schemes was evaluated by the cell.

Punjab: Although assistance of Rs.0.50 lakh was released by the Board in 1985-86 for creating a monitoring cell, no such cell had been created. The Principal Chief Conservator of Forests stated (March 1990) that their proposal for creating a monitoring and evaluation cell had not been approved by the State Government.

The Ministry stated, in February 1991, that to effect improvement in the system of monitoring, a Working Group, set up in 1990, had examined the existing formats and procedures and their recommendations were under examination by the Board.

7. Unutilised grant-in-aid

A project entitled "inter-disciplinary analytical evaluation of environmental aspects of river Subarna Rekha near Ranchi" was approved by the Department of Environment, Forests and Wildlife in March 1985. The project was to be conducted by Ranchi University at a total cost of Rs.5.66 lakhs and to be completed within three years. The first instalment amounting to Rs.2.92 lakhs, including Rs.2.40 lakhs for purchase of equipment, was released to the University in March 1985.

During 1985-86 , the University released Rs.0.25 lakh to the principal investigator. A further amount of Rs.0.50 lakh was released in May 1986. The balance amount of grant released to the University had been diverted for other purposes.

The Department did not pursue with the University for the consolidated half-yearly reports, due in October 1985 and April 1986, for review of the progress and for advice by the special monitoring committee constituted by the Department as per terms of the sanction.

Principal investigator informed that the University had not advertised for the post of research associate, research scholars and field assistants and that two research fellows joined the project in September 1985. Further, the University had selected wrong candidates with the result that they were not able to do much work in the project.

On receipt of this information from the principal investigator, the Department wrote to the University, in September 1986, to transfer the fund to a separate project account within 30 days failing which the project would be deemed as closed and the balance of funds should be refunded to the Department. As no reply was received, the Department informed the University in January 1987 that the project be closed down and requested to refund the balance alongwith statement of expenditure and utilisation certificate. The unutilised amount of Rs.2.17 lakhs remained blocked with the University.

The Department stated, in December 1990, that the University has since refunded Rs.1.74 lakhs in July 1990 but the expenditure statement and utilisation certificate were still awaited.

Thus, the expenditure of Rs.0.75 lakh incurred on the project had proved to be infructuous besides the blocking of Rs.2.17 lakhs since March 1985 out of which Rs.1.74 lakhs was refunded in July 1990.

Ministry of Science and Technology

Department of Science and Technology

8. Setting up a photosynthesis unit

Department of Science and Technology sanctioned, in May 1984, a project for setting up a photosynthesis unit, for a duration of five years, at an estimated cost of Rs.59.92 lakhs out of which a sum of Rs.43 lakhs was released immediately. The project was short closed in October 1988, after spending Rs.49.80 lakhs, frustrating the purpose for which it was sanctioned. The Department stated, in September 1990, that they "gather" that some studies had been carried out and 18 researchers had been trained which was " no mean achievement".

The project for the photosynthesis unit (chloroplast genetics and UV-radiation on plants in the areas of physiology and biochemistry of plants) at Madurai Kamaraj University, Madurai had been approved as a unified programme under "Intensification of research in high priority areas", in a meeting of the Science and Engineering Research Council (SERC) in December 1983. The original estimated cost of Rs.59.92 lakhs was revised to Rs.65.39 lakhs in July 1987. A sum of Rs.43 lakhs was released in June 1984, Rs.5 lakhs in August 1987 and Rs.1.80 lakhs in August 1989. The aspect of chloroplast genetics was to be studied by the project coordinator whereas the study of UV-radiation on plants was to be carried out by an associate.

The Monitoring and Advisory Committee of the project met for the first time in December 1986, i.e., after 2 1/2 years from the date of commencement of the project. The Committee was apprised of the non-availability of trained persons with bio-chemical and molecular and biological background, at faculty and scientific level, to work under this project.

In the next meeting of the Committee held in September 1987 it was felt that there had been lack of progress because the programme coordinator had been appointed Vice-Chancellor of a University from March 1985 and there were problems regarding the filling up of posts. Also, serious doubts were raised about the prospects of the programme coordinator coming back from the post of Vice Chancellor. The Department finally decided to close the project from October 1988. Inspite of knowing the appointment of programme coordinator as Vice Chancellor of another University in March 1985,

funds had been released leading to prolongation of the project.

The Department stated, in March 1990, that it was true that for 2 1/2 years no meeting of the committee could take place but added that it was not due to lack of efforts of the Department.

Out of the amount of Rs.49.80 lakhs released upto August 1989 by the Department, equipment costing Rs.25.23 lakhs were procured for the project under the programme coordinator's segment. The Department was still exploring possible use of the equipment lying with the University and stated, in September 1990, that the equipment would be utilised for a programme of the Department of Bio-technology.

9. Serial on astronomy

In August 1985, it was decided by the Films Division, Ministry of Information and Broadcasting (I&B) to produce a television serial on "astronomy", in 30 episodes, under the guidance of an eminent professor, with the objective of depicting the science of astronomy to the common man. Production of serial was to be completed in 12 months. Considering the expensive nature of the project, the Films Division requested the Department of Science and Technology (DST), in August 1985, to meet the expenditure on 'research and preparation of background material'. After spending Rs.6 lakhs and committing Rs.3 lakhs more, DST had no research material with them nor did they have any idea of the progress made in the research activity during the four years since the sum of Rs.6 lakhs was released by them in May 1986.

Out of Rs.9 lakhs sanctioned by DST for this project in May 1986, Rs.6 lakhs were released immediately and the balance was to be released after the receipt of utilisation certificate, certified statement of expenditure and justification for the release of remaining amount. In April 1988, I&B informed DST that out of Rs.6 lakhs given to the Films Division, Rs.1.66 lakhs had been spent, including Rs.0.19 lakh incurred on the visit of the eminent professor abroad in connection with a conference in Copenhagen. Intention to spend another Rs.0.33 lakh for attending the conference, in USA, for the International Astronomical Union, by the eminent professor, was also intimated.

In September 1989, I&B informed DST that about six episodes had been completed and the shooting of five more was nearing completion. Neither the expenditure statement nor the progress made on the project had been received in the DST. It was stated by DST, in November 1990, that the research material and information would normally be available in DST on the completion of the project. This is not tenable as DST ought to have monitored the progress made from time to time to ensure proper utilisation of the grant released.

Survey of India

10. Non-commissioning of photogrammetric instrument

Survey of India, imported a photogrammetric instrument for Rs.12.53 lakhs through the State Trading Corporation of India Limited. The consignment was cleared by the Director of Supplies and Disposals, Bombay and was received by Survey of India, at Mount Abu, in March 1982.

The engineer of the foreign firm noticed, at the time of installation in April 1982, that major components were damaged in transit and the equipment was received in defective condition. An insurance claim for Rs.2.93 lakhs was made by the Survey of India, in July 1982, on the basis of a survey for damages in transit conducted in May 1982. As per final assessment, a claim for Rs.1.92 lakhs was accepted by the insurance company which was settled in September 1987.

The foreign firm supplied the parts in replacement of defective ones in November 1984, which were received in May 1985. However, the foreign firm and their local agent could not succeed in commissioning the equipment despite several visits of the engineer during August 1985 to September 1987.

The service engineer of the foreign firm expressed (May 1989) his inability to carry out the repairs. The Survey of India informed Audit in June 1990 that the efforts were being made at higher level to get the instrument repaired and commissioned. A sum Rs.12.53 lakhs spent over imported instrument eight years ago was yet to achieve any purpose.

The Ministry stated, in November 1990, that the matter was under correspondence with the new Indian agent of the foreign supplier.

Department of Atomic Energy

11. Nugatory investment

In December 1984, the Department of Atomic Energy approved the proposal of the Heavy Water Plant, Baroda for their participation in setting up of joint captive power plant at Baroda and to contribute Rs.170 lakhs towards equity. The objective was to overcome frequent power cuts by the Gujarat Electricity Board and consequential loss in production at the Baroda plant. Accordingly, a company, viz., Gujarat Industrial Power

Company Limited (GIPCL) was formed in June 1985 with registered office at Baroda.

Keeping in view the proportion of power to be drawn by the Baroda plant from the joint captive power plant (8 MW), a sum of Rs.3.57 lakhs towards fees, consultancy services and equity floatation was released during January 1984 to August 1985. Further, at the request of GIPCL, an interest free loan of Rs.16.66 lakhs was also paid, in February 1987, towards purchase of land.

Subsequently it was decided, in September 1987, by the Department to withdraw participation from GIPCL and the latter was requested, in September 1987, to refund the amount of Rs.20.23 lakhs already paid to them. GIPCL replied, in February 1988, that (i) share capital of Rs.2.83 lakhs could not be refunded as per the Companies Act, (ii) the amount of Rs.0.73 lakh paid towards initial project expenses had already been spent and hence could not be refunded, but equity shares for this amount would be issued and (iii) interest-free loan of Rs.16.66 lakhs had been treated as 'dormant investment' and as such it would not be refunded till such time as the disposal/further use of the land was decided.

The decision to invest in the joint captive power plant and subsequently to withdraw from it resulted in nugatory expenditure to the tune of Rs.20.23 lakhs.

The Department stated, in September/November 1990, that after evaluating techno-economic feasibility report it was realised that the outlay of the captive power plant would be very high and their share would be much more than what was anticipated earlier. This led to the withdrawal of participation. The Department also stated that the question of refund was under correspondence with the GIPCL which have agreed to refund Rs.16.66 lakhs.

12. Development of an alloy

Heavy Water Project (HWP), Bombay placed a work order in March 1981 on Mishra Dhatu Nigam Limited, a public sector undertaking for development of an alloy. The scope of the work was to standardise the process parameters, testing and evaluation procedure for development of the alloy and its billets leading to its commercial production. The work order also provided development of the alloy in three heats and in each heat 2.35 tonnes of raw materials were to be used. The product developed, including the process scrap, after each heat run would be the property of Heavy Water Project. Share of HWP for the development expenses was limited to Rs.15 lakhs at the rate of Rs.5 lakhs per heat run.

HWP paid an advance of Rs.12 lakhs in June 1981. The firm developed (September 1986) 2247 kgs. of alloy billets out of 7055 kgs. of raw materials used and declared the balance as scrap/waste. Further, the firm agreed to absorb 10 per cent of the basic raw material as production waste and offered a rate of Rs.30 per kg. for 4103 kgs. of scrap as scrap value. This was agreed to and an amount of Rs. 1.23 lakhs was adjusted in the final payment made to the firm.

Though the firm despatched the developed alloy to Nuclear Fuel Complex (NFC)in September 1986, they could not manufacture any tubes so far.

The Department stated, in September 1990, that the billet material had been made available to NFC for the development of hot extension/cold drawing characteristics of the material and for making prototype tubes. It was a developmental effort and if developed successfully dependence on import of tubes could be overcome. However, the fact remained that nothing had been done during the last four years since despatch of the material in September 1986.

13. Excess purchase of spares

A test check of the stock cards, conducted in March 1988, in the Rajasthan Atomic Power Station (RAPS I and II) revealed that huge quantity of spare parts was lying unused for nearly five years and without any prospect of their use in the near future.

Purchase orders for import of spares worth Rs.1.43 crores, on proprietary basis, were placed in October 1981 and supplies were received and taken into stock in April/May 1984. During the six years since then, there were small issues of 21 items in six stock cards and no issue at all in respect of remaining 391 stock cards. Consequently, substantial funds have remained blocked for the last over six years . Also, there was risk of the stores becoming obsolete with the passage of time.

The contention of the Department of Atomic Energy (February 1991) that the spares were purchased to ensure a long-term trouble free operation is well recognised but non-use of the huge quantity of the spares for such a long time either in these plants, or elsewhere in the sister plants, is indicative of the fact that the stores were acquired without a realistic assessment of the requirements.

14. Surplus material lying in project stores

On the basis of requirements of the Dhruva project and the Bhabha Atomic Research Centre (BARC), the Directorate of Purchase and Stores placed an order, in

November 1980, on a foreign firm for supply of hot finished stainless steel pipes valuing Rs.17.59 lakhs. 60 pieces received in central stores of BARC in December 1981 were despatched to Nuclear Power Board (NPB) Project Stores in January 1982. The Superintending Engineer, Power Projects Engineering Division informed in March 1984 that these pipes were not suitable for moderator system and the same might be sent to Dhruva Project. The group leader of the Dhruva Project informed, in May 1984, that the pipes were originally meant to take care of anticipated shortage, but were no longer required, and reiterated that these pipes were procured for Kakrapar Atomic Power Project (KAPP). The NPB directed the Project Stores Officer to return the pipes to Dhruva Project as these pipes were not required for KAPP. These pipes were taken on stock by NPB Project Stores, in January 1985, as they were declared surplus.

Out of 60 pipes, 14 pipes (value Rs.1.76 lakhs) were issued till August 1990 leaving a balance of 46 pipes valued at Rs.5.79 lakhs approximate in stock. Placement of order in November 1980 without ascertaining the actual requirement of the projects resulted in blocking up of funds. Also, due to obsolescence the stores so far lying unutilised may not be used anywhere leading to wasteful expenditure.

The Department stated,in August 1990,that these pipes were originally intended for use in the moderator system but after the procurement of these pipes some design changes were brought out in the system as a result of which these pipes became surplus. It was further expected that the balance quantities may be used in future projects.

15. Unrealistic assessment of electricity requirement

An Audit analysis of the electricity bills of Atomic Minerals Division, Bangalore for the period from September 1986 to December 1989 brought out that the contracted maximum demand was much higher than the consumption of electricity at any point of time resulting in avoidable payment of Rs.5.48 lakhs towards electricity.

The data is tabulated below :-

Period	Contracted demand	Peak consumption in a month
September 1986 to January 1987	500 KVA	25 KVA
February 1987 to March 1989	650 KVA	70 KVA
April 1989 to December 1989	250 KVA	73 KVA

It was not necessary to provide for a prospective upward revision to 650 KVA in the original agreement of July 1986. The sharp downward revision to 250 KVA was a sequel to the Audit observation regarding the unduly high level of the contracted demand. The Division stated in July 1989, that the demand of 650 KVA from February 1987 was worked out based on requirement for residential accommodation, laboratory including stores, crushing shed and also providing for future expansion. Low utilisation was attributed to the expected expansion on housing, crushing shed etc., not having taken place due to financial constraints.

The Department stated, in November 1990, that many of the laboratory equipment which were expected could not be received and installed according to the time schedule and this abnormal delay could not be anticipated at the time of working out the contracted demand. The reply of the Department is not tenable as the pronounced gap between the contracted demand and the range of consumption was manifest from the very beginning and was persisting for 33 months.

Department of Electronics

16. Inadequate appraisal and monitoring of a project

A project entitled "Studies on printed antennas on cylindrical surface leading to their design and development" was initiated, in March 1985, at the Indian Institute of Technology (IIT), Kharagpur for a period of three years and with an outlay of Rs.17.80 lakhs (with foreign exchange component of Rs.10.80 lakhs). The project was sanctioned by Department of Electronics for establishing a technology base and to build an expertise in the country in the area of conformal microstrip antennas in view of its promising airborne and missile application. An amount of Rs.13.90 lakhs was released by the Department in March and November 1985. Under the project a printed circuit fabrication facility reduction camera was imported from USA at a cost of Rs.7.22 lakhs in November 1986.

In a meeting of the Project Review and Steering Group (PRSG) of the Electronics Commission, in August 1987, it was found inter alia that (i) the project was behind schedule by two years, (ii) two of the chief investigators earlier appointed had gone abroad and IIT did not pass on this information to the Department and (iii) the camera costing Rs.7.22 lakhs procured for the project was made operational but was not being utilised for the project. The PRSG, therefore, opined that the camera could be given to some other project of the Department or any other organisation carrying out work

on millimeter wave technology. It was also observed by the PRSG that the IIT should be requested to refund the unspent balance along with the audited statement of accounts and utilisation certificates. The PRSG felt concerned about the considerable slippage of two years in the project and recommended for its short closure The project was closed in September 1987.

The Department had no means/methods to know that the two chief investigators appointed by them had gone abroad, leaving the project in the middle and that the third chief investigator had two projects already with him.

Thus, the project which was required to be completed by February 1988 was foreclosed in September 1987 and the expenditure of Rs.11.76 lakhs incurred on the project did not serve the purpose. Besides, Rs.2.14 lakhs lying with the IIT had not been refunded.

The Department stated, in September 1990, that while short closing the project, the assets created were transferred to other projects. Details of such transfers are not furnished.

Department of Space

17. Procurement of propellant tanks

The Department of Space imported, during April 1988 to August 1989, four propellant tanks for their project, Polar Satellite Launch Vehicle (PSLV), at a total cost of Rs.1036.03 lakhs. The Department paid an extra amount of over Rs.6 lakhs as bank commission for opening the letter of credit and incurred an expenditure of Rs.97.57 lakhs on airfreight.

The Department entered into two contracts with a foreign supplier, in December 1985, one for fabrication and supply of three propellant tanks, one set of components and one set of tooling and the other contract for technical know-how, training services and development tank at a total value of Rs.1057.21 lakhs in foreign exchange for the second stage of Polar Satellite Launch Vehicle. Later, the Department decided to obtain the fourth tank in assembled condition on payment of additional sum of Rs.36.37 lakhs having exercised the option contained in the agreement.

Different periods were stipulated for delivery of tanks ranging from 21 to 39 months and also different dates were provided in the contract for the supply of tooling and sets of technical know-how documents. As per the agreements, all payments were to be made to the supplier through one irrevocable and divisible letter of credit (LC) in the form acceptable to them for an amount equal to 100 per cent of the aggregate price of both the agreements less two per cent agency commission. The Department established letter of credit for the value of the contract, Rs.1036.03 lakhs approximately, through a bank, in December 1985, with validity upto December 1988. Contract provided for milestone payments depending on the delivery schedule/shipment, according to which a sum of Rs.10.65 lakhs was required to be paid as bank commission. But the Department paid a sum of Rs.16.84 lakhs as commission without taking into account the reduction for the milestone payments. The Department stated, in January 1991, that the matter has been taken up with the bank which has agreed to recalculate the commission amount.

The original terms of the contract was for transportation of all the tanks by sea. It was decided in February 1988 to bring the first tank by air. The tank was air-lifted in April 1988 on payment of Rs.29 lakhs as air freight. Due to safe handling and urgency the Department had further decided, in April 1988, to airlift the remaining three tanks also. The second tank was airlifted in August 1988 paying Rs.30.32 lakhs as air-freight. As per the suggestions of the PSLV Management Council, the Department airlifted the third and fourth tanks in one consignment in April 1989 at a cost of Rs.38.25 lakhs as against the total airfreight of Rs.59.32 lakhs paid for the first and second tanks. Though the first and second tanks were received by the project in April and August 1988 respectively, the consignments were opened for a second proof test only after August 1989 alongwith the third and fourth tanks.

The Department stated (January 1991) that these could be inspected only in November 1989 as these were to be proof tested only in the presence of the representatives of the supplier, and were subsequently pressure tested and accepted. It was also stated that these tanks were critical elements of second stage of PSLV project in which there were slippages in schedule.

CHAPTER III

Autonomous Bodies

18. Accounts and Utilisation Certificates

The accounts of autonomous bodies which are receiving financial assistance from Government are being audited by the Comptroller and Auditor General of India under various provisions of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

As on 31st March 1990, there were 34 Central autonomous bodies of Scientific Departments whose annual accounts were to be audited by the Comptroller and Auditor General of India. During 1989-90, grants/loans amounting to Rs.538.65 crores were paid by the Union Government to 17 bodies. The annual accounts for 1989-90 in respect of the remaining 17 bodies had not been received (March 1991). Of these, 15 had received grants/loans amounting to Rs.41.27 crores in 1989-90.

The audited annual accounts of five autonomous bodies, viz., Sree Chitra Tirunal Institute of Medical Sciences and Technology (Trivandrum), Indian Council of Medical Research, Council of Scientific and Industrial Research, Indian Council of Agricultural Research and Wild Life Institute of India (Dehra Dun), alongwith the separate Audit Reports on each individual body/organisation, are presented to Government of India for being placed before Parliament. Out of these, the accounts of one body, viz., Council of Scientific and Industrial Research were made available for audit within the prescribed time limit. Submission of accounts in respect of the other four bodies had been delayed upto three months.

Outstanding Utilisation Certificates

Certificates of utilisation of grants were required to be furnished by the Ministries/Departments concerned to the Controllers of Accounts in respect of grants released to statutory bodies, non-government institutions etc. for specific purposes indicating that the grants had been properly utilised for the purposes for which they were sanctioned, and that, where the grants were conditional, the prescribed conditions had been fulfilled.

Utilisation certificates for Rs. 779.51 crores were outstanding as per the Ministry/Department-wise details given in Appendix II. These are based on the information furnished by the Pay and Accounts offices concerned. It would be seen from the details of outstanding utilisation certificates that these were outstanding since 1976-77 onwards as had been brought out in the Reports, for the last three years, of the Comptroller and Auditor General of India : Union Government (Scientific Departments) - No.7 of 1988, No.7 of 1989 and No.2 of 1990.

Ministry of Agriculture

Department of Agricultural Research and Education

Indian Council of Agricultural Research

19. National Dairy Research Institute, Karnal

19.1 Introduction

National Dairy Research Institute (Institute), Karnal, is a constituent unit of the Indian Council of Agricultural Research (ICAR). In April 1989, the Institute was conferred the status of 'Deemed University' under the University Grants Commission Act, 1956.

The Institute conducts basic and applied research in all branches of dairy science and technology connected with milk production, breed improvement and milk processing. It organises courses, at graduate and post graduate levels, and national and international training programmes. It also undertakes extension, education and transfer of technology.

19.2 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. This review covers generally the activities of the Institute (except Southern Regional Station, Bangalore) for the period 1985-1990.

19.3 Organisational set up

The Institute is headed by a Director and managed by a Board with 23 members of which 11 are external experts. The Board which is the highest policy making body of the Institute is assisted by an Executive Council, the main implementing body on administrative matters, Research Council which is responsible for all round progress of research and their application, Extension Council which is responsible for extension programmes, and Academic Council which is responsible for matters relating to education and training. The Academic Council is further supported by Standing Committees, Post Graduate Faculty and the Board of Studies.

The Institute has 10 functional divisions. Besides there are Dairy Science College at Karnal and regional station at Bangalore and Kalyani.

The Institute has 2245 sanctioned posts of which 266 are scientific personnel. As on 1st April 1989, it had 2091 personnel of which 226 were scientists, 431 technical personnel and remaining auxiliary and supporting staff.

19.4 Highlights

- *During the five years 1985-90, non-plan expenditure exceeded provision of funds by Rs.358.96 lakhs whereas there was under-utilisation of plan funds to the extent of Rs.43.64 lakhs, indicating inadequate budgetary control.*

- *Staff Research Council, which is responsible for monitoring the progress of research activities and giving clearance to continuance of ongoing research projects and undertaking new ones, met only once in a year resulting in inadequate monitoring of research projects and utilisation of research facilities.*

- *Scientists who joined the Institute after the annual meeting of the Staff Research Council or whose projects were completed after the meeting could not be assigned any research project till the next meeting, which was held after one year. In 1988, no fresh project was approved and many scientists could not be assigned any project resulting in under - utilization of scientific manpower. Seventy one scientists were not engaged on any research project for periods ranging from six months to three years.*

- *Fourteen research projects involving 37 scientists were prematurely abandoned/terminated, due to transfer, deputation, resignation or retirement of scientific personnel and lack of finance, rendering the expenditure of Rs.26.99 lakhs infructuous.*

- *Number of faculty members far exceeded the number of students and there was large incidence of discontinuance of studies midway.*

- *There was under-utilisation of the experimental dairy plant even after procuring milk from outside and the purpose of earning profits for the "Revolving fund" was not likely to achieved.*

- *Inadequate monitoring of the work of production and maintenance workshop is causing difficulty in commercialisation of the equipment designed and developed.*

- *Inspite of declining response there was an "effort to discourage farmers from other States" for the training programmes organised at the Krishi Vigyan Kendra of the (national) Institute.*

- *Model dairy demonstration units proposed by the Krishi Vigyan Kendra, for adoption by villages, were not proving economically viable.*

- *'Lab to land' programme for transfer of technology was discontinued, due to shortage of funds eventhough it had a definite impact, resulting in denial of research benefits to the society.*

19.5 Budget and expenditure

The Institute is mainly financed through grants released by the Department of Agricultural Research and Education to the Indian Council of Agricultural Research. Funds are also provided from Agricultural Produce Cess (AP Cess) Fund and by foreign agencies and other Departments/Ministries of Central Government.

The provision of funds and expenditure incurred during the five years, 1985-90, as per annual accounts are given below:-

(Rupees in lakhs)

	1985-86		1986-87		1987-88	
	Budget provision	Expenditure	Budget provision	Expenditure	Budget provi-	Expenditure
NonPlan	372.55	401.55	408.30	459.25	466.99	506.94
Plan	146.60	155.10	105.50	100.46	67.50	44.96
Agricultural Produce Cess Fund	7.67	5.07	3.25	2.67	-	-
ICARschemes	2.85	16.74	6.92	12.20	17.74	15.94
PL.480/UNDP schemes	4.60	3.84	-	-	1.85	1.63
Deposit schemes -		-		-	-	11.21
	544.27	582.30	523.97	574.58	554.08	580.68

	1988-89		1989-90		1985-90	
	Budge provision	Expenditure	Budget provision	Expenditure	Budget provision	Total Expenditure
Non Plan	493.50	562.67	625.00	794.89	2366.34	2725.30
Plan	80.00	78.47	70.00	46.97	469.60	425.96
Agricultural Produce Cess Fund	0.11	0.12	-	-	11.03	7.86
ICAR schemes	16.50	16.59	7.52	12.51	61.53	73.98
PL.480/UNDP schemes	10.00	10.47	-	2.07	16.45	18.01
Deposit schemes	-	35.97	-	75.56	-	122.74
	600.11	704.29	702.52	932.00	2924.95	3373.85

During the last five years (1985-90) non-plan expenditure exceeded budget provision by Rs.358.96 lakhs (Rs.2725.30 lakhs against provision of Rs.2366.34 lakhs) and there was under- utilisation of plan funds to the extent of Rs.43.64 lakhs (expenditure of Rs.425.96 lakhs against provision of Rs.469.60 lakhs) indicating inadequate budgetary control.

19.6 Research projects

19.6.1 Policy planning

In April 1985, ICAR issued policy guidelines for research to be carried out by various divisions of the Institute and stressed the need for applied research through multidisciplinary teams. The Quinquennial Review Team (team) gave its report in October 1986 reiterating this and observed that most of the projects in the Institute seemed to be nibbling at research and not fully tackling the problem. The team felt that the research should be need based and result oriented and should have a time bound programme. The team recommended setting up of a Research Advisory Sub-Committee composed of persons with industrial research and development background to advise the management committee regarding immediate research priorities and programmes. ICAR suggested to the Institute, in June 1987, to prepare a perspective multidisciplinary and time bound research plan keeping in view the national priorities and industry's problems. The Institute did not set up the Research Advisory Committee and instead claimed that a long term policy commensurate with the needs of the industry, producers and consumers has been developed with the help of experts co-opted in the Staff Research Council as well as Management Council.

The Institute mentioned, in July 1990, that a perspective long term research plan based on the mandate of the Institute had since been prepared which had also been approved by the Staff Research Council. It was, however, noticed in Audit that only the ongoing projects of the Institute were classified into ten major missions without actually identifying the priorities for dairy research.

ICAR stated, in December 1990, that the comments of Quinquennial Review Team were of a very general nature and not based on any in-depth study. The re-

search at the Institute is carried out through two specific directions, viz, (i) Student Research Projects and (ii) Staff Research Council Research Projects. The former is aimed at building well trained man power to tackle future problems and research objectives while the latter is to have industrial applications and assist farming community in deriving maximum benefits from existing inputs and make them viable.

19.6.2 Under-utilization of scientific manpower

The Staff Research Council of the Institute which reviews current research programmes, their progress , utilisation of research facilities and also approves new research programmes is required to meet as often as necessary but at least once in each quarter. The Research Council met only once in each calendar year and that too in the last quarter of the year. As a result, the scientists who joined the Institute after the annual meeting of the Staff Research Council could not be assigned any research project till its next meeting. During 1988, no new project was approved. Scientists whose projects were completed in December 1987 or sometimes during 1988, could not be assigned any project till date. During 1989 also, only one meeting was held, in November 1989, in which neither the ongoing research projects were reviewed nor new projects to be taken up from January 1990 were discussed.

Test check in Audit revealed that 71 scientists, 67 of the Institute at Karnal, and 4 of the eastern regional station, Kalyani were not engaged on any research project for periods ranging from six months to three years resulting in inadequate deployment of highly qualified persons.

ICAR stated, in December 1990, that according to Director General (ICAR)'s guidelines the meetings are being held annually and generally in the last quarter of the year so that the projects could be taken up for implementation without any loss of time. About the scientists joining the Institute after the Staff Research Council meeting it was stated that such scientists were engaged in extension and teaching activities. On the other hand, the Institute had stated that some of the scientists who joined after the meeting of the Research Council could not be assigned any project but others were engaged in teaching and supervising the work of M.Sc./Ph.D. students. It was, however, observed that in most of the cases where scientists were engaged on teaching work, the time devoted ranged from 20 to 40 per cent of their total time. Some of the scientists were only engaged on guiding Ph.D. students. Also the aggregate number of students never exceeded 92 and the number of Ph.D. students were between 17 and 22 as against 144 faculty members. It was further noticed that scientists were also looking after the work of technicians in farm and management of cattle yards.

ICAR's contention (December 1990) that the figure of scientists without research projects is not alarming considering the size of the Institute is not tenable as the total number of scientists in the Institute was 226 out of which 144 were on teaching faculty and some others were doing work as farm technicians etc. Besides, in contravention of the directions given by ICAR , in 1986, the Institute continued the research programmes relating to cattle genetics and research on breeding of buffaloes and goats though separate Institutes for research on these aspects are already existing.The Governing body of ICAR again directed the Institute, during December 1989, to transfer the buffalo and goat herds to respective institutes (Hissar and Makhdoon) but it was not done.

19.6.3 Premature termination, abandonment of research projects

Fourteen research projects involving 37 scientists were prematurely abandoned/terminated after running for 12 to 30 months rendering the expenditure of Rs.26.99 lakhs infructuous. Reasons attributed to this were transfer, deputation, resignation or retirement of the researchers and lack of finance. The Institute stated that the resignations, retirements transfers were not within the control of the Institute. ICAR stated, in December 1990, that to avoid premature abandonment of research projects it had been made compulsory for each project leader to have at least one research associate to ensure that no research project was left unmanned till its logical end.

19.7 Educational activities

The Institute was conferred the status of a 'Deemed University' in 1989 under the University Grants Commission Act 1956. Prior to this it was affiliated to Kuruk shetra University. The Institute provides education in dairy technology at B.Sc. level as well as at post graduate level. The post graduate faculty teaching staff strength and the number of students admitted during the last five years from 1985-86 to 1989-90 were as under:

Year	Faculty members (Teaching staff)	No. of students admitted B.Sc.	M.Sc.	Ph.D.	Total
1985-86	146	38	25	27	90
1986-87	149	18	37	26	81
1987-88	143	22	39	31	92
1988-89	145	19	26	22	67
1989-90	144	21	54	17	92

Apart from large number of faculty members, scientists are also engaged for guiding Ph.D. students, although number of students admitted to various courses is small. Further the faculty available in individual disciplines far exceeded the requirement as detailed below:

Faculty	No of faculty members	No. of students admitted M.Sc. 1988-89	M.Sc. 1989-90	Ph.D. 1988-89	Ph.D. 1989-90
Dairy Extension	7	2	2	4	2
Dairy Economics/ Statistics	16	-	4	2	3
Dairy Technology	20	4	8	2	-
Dairy Engineering	12	1	-	-	-
Dairy Microbiology	19	2	6	-	5
Animal Biochemistry	12	5	5	-	-
Dairy Cattle Breeding	18	5	9	4	2
Dairy Cattle Physiology	4	4	-	2	-
Dairy Chemistry	19	2	4	3	-
Dairy Cattle Nutrition	17	1	7	5	5
Animal Biotechnology	-	-	9	-	-
	144	26	54	22	17

It was noticed that 37 B.Sc., 33 M.Sc. and 18 Ph.D. students admitted during 1985-86 to 1989-90 discontinued their studies midway. Six of the 18 Ph.D. students were sanctioned and paid fellowships amounting to Rs.1.27 lakhs during 1986-87 to 1989-90. Due to discontinuance of the studies the expenditure on fellowships became infructuous. ICAR stated, in December 1990, that the number of students admitted in M.Sc and Ph.D courses was kept limited as per the requirements of dairy industry and research organisation.

19.8 Other activities

19.8.1 Experimental dairy plant

The dairy plant at Karnal, renovated during 1983-85 at a cost of about Rs.75 lakhs, has a capacity to process about 10,000 litres of milk per shift per day. The plant is equipped with major equipment for the manufacture of a range of dairy products, and has all the staff needed for its operations. The plant was built with the objective of providing facilities for product development and practical training to students of Dairy Science college. The milk supplied to the plant by the cattle yard of the Institute, however, ranged from 4000 to 4500 litres per day. Thus, the capacity of the plant was all along underutilised.

In 1988, the Institute sought the approval of ICAR for purchasing milk from outside so that the plant could be operated at its full capacity and proposed the creation of a "Revolving Fund" of Rs.85.00 lakhs to be financed from Agricultural Produce Cess Fund. The plant if operated at full capacity was estimated to earn a profit of Rs.133 lakhs per annum.

ICAR communicated, in July 1989, its approval for the creation of the revolving fund with an initial investment of Rs.85 lakhs with effect from July 1989. The scheme was to run on trial basis till March 1990. The receipts accruing from sale of products was to be credited to the revolving fund but the salaries of staff were to be debited to the Institute funds.

A test-check in Audit revealed that the plant received 18.76 lakh litres of milk of which 7.41 lakh litres was purchased from outside at an average of 6950 litres per day during the period from July 1989 to March 1990.

The financial results of the operation upto March 1990 and review of the performance of the dairy indicated that even if the plant was run to its full capacity of processing 10,000 litres of milk per shift per day its estimated profit of about Rs.133 lakhs per annum was not based on realistic consideration. ICAR stated, in December 1990, that the dairy plant has earned a profit of Rs.57,000 during the year (1989-90) and if salary and other non recurring expenditures are excluded the profit will go upto nearly Rs 20 lakhs. According to ICAR, the plant ran at 80 per cent capacity for seven months in that year. The purpose of creating the revolving fund for earning a profit of Rs.133 lakhs per annum is, thus, not likely to be achieved.

19.8.2 Production and maintenance workshop

One of the objectives of the Institute was to design and develop dairy equipments. The Quinquennial Review Team had recommended in 1986 that the Institute should appoint an adhoc committee to formulate the objectives for research and development on Dairy Engineering keeping in view the present research needs in India and that a Dairy Equipment Release Committee should be constituted to examine the items of equipment designed and developed by the Dairy Engineering Division. It was noticed that these committees were not constituted even after four years. The Institute accepted the facts. Although Dairy Engineering Division had drawn a short term perspective plan for

development of dairy equipments but in the absence of Dairy Equipment Release Committee it was difficult to commercially exploit the equipments. ICAR stated, in December 1990, that, in the Institute, the major thrust is on research, design and development. That being so, during the Seventh Plan period prototypes of only seven equipments have been fabricated and out of that patent application have been filed for only two.

19.9 Extension activities

19.9.1 Krishi Vigyan Kendra (KVK) and Trainers Training Centre (TTC)

The KVK and TTC at Karnal were established in July 1976. The KVK is the grassroot level vocational training institute designed for bridging the gap between the available technologies on the one hand and their application for increased production on the other. The KVK imparts training to those extension workers who are already employed and to the practising farmers and fishermen while TTC offers training to the trainers/instructors of extension training centres, farmers training centres etc. For this purpose, various skill and production oriented short and long-term courses are organised by the KVK/TTC each year.

Five scientists, 12 technicians and four other staff members with facilities of a separate building, three laboratories, two demonstration units, eight hectares of farm land 20 animals and a vehicle have been provided to these units for operational requirements.

Test-check in audit revealed that the activities of both KVK and TTC were on the decline over the years while the recurring expenditure had considerably increased, as is apparent from the following table:

Year	Krishi Vigyan Kendra		Trainers	Training	Centre	Recurring Expenditure	
year	Number of courses per	Number of Trainees	Mandays trained	Number of courses	Number of trainees	KVK (Rupees in lakhs)	TTC
1985	137	2,612	14,867	22	239	4.02	2.82
1986	123	2,877	15,203	24	344	4.58	2.68
1987	133	2,352	14,245	22	238	5.17	3.22
1988	112	1,971	19,828	15	156	6.23	3.95
1989	59	1,186	13,151	18	195	7.48	4.92

Thus, there was a reduction of 57 per cent in the courses and 55 per cent in the number of trainees during 1989 under KVK as compared to 1985. The reduction under TTC both in respect of courses and number of trainees was 18 per cent. Still the recurring expenditure under KVK and TTC during 1988-89 had increased by 86 per cent and 74 per cent respectively as compared to 1985-86. The Institute stated (July 1990) that the reduction in courses and the number of trainees was due to lack of response. On the other hand, ICAR stated, in December 1990, "it has been our effort to discourage the farmers from other States" for the training programmes. It is not understood as to why a national institute should discourage farmers from other States.

The Dairy Demonstration Units at KVK were established to demonstrate to the farmers the comparative advantages and economic viability of maintaining such model units. A test check in audit, however, revealed that the model units as proposed by the Institute for adoption by the villagers were not proving economically viable as indicated by the Income and Expenditure statements. The details are as follows:

		1985-86	1986-87	1987-88	1988-89
		(Rupees in lakhs)			
I	One hectare 6 buffalo unit				
	Total expenditure	0.39	0.52	0.58	0.57
	Gross Income	0.34	0.41	0.53	0.60
	Net Income	(-)0.05	(-)0.11	(-)0.05	(+) 0.03
II	One acre 3 cow unit				
	Total expenditure	0.19	0.24	0.31	0.30
	Gross Income	0.39	0.37	0.37	0.48
	Net Income	0.20	0.13	0.06	0.18
III	One hectare crop unit				
	Total expenditure	0.19	0.25	0.34	0.19
	Gross Income	0.27	0.20	0.18	0.14
	Net Income	0.08	(-)0.05	(-)0.16	(-)0.05
IV	One acre 3 buffalo unit				
	Total expenditure	0.16	0.21	0.33	0.29
	Gross Income	0.32	0.29	0.38	0.30
	Net Income	0.16	0.08	0.05	0.01

The demonstration units, ironically, were not cost effective as operated by the KVK and could not be expected to secure any demonstration effect. ICAR stated, in December 1990, that two model units are showing profits and other model units are showing

deficits on account of high wages, low price of milk sold, unprotected site and cumbersome procedures. It was also stated that the Institute was trying to raise a boundary wall and take other steps to make these units economically viable and to recommend their adoption by the farmers.

19.9.2 'Lab to land' programme

In 1979, ICAR launched a 'Lab to land' programme in an effort to transfer new technology from laboratories to fields with the objectives of (i) generating additional employment and income opportunities for improving socioeconomic status of the adopted poor families through transfer of new technology; (ii) identifying constraints in the transfer and adoption of new technology; (iii) developing strong feedback mechanism so as to evolve and promote need based technology.

The Institute was allotted 1000 families in phase-I (1972-82), 1100 families in phase-II(1982-84) and 1200 families in phase-III (1984-86). The programme was operated in 32 adopted villages around Karnal. The project was funded with the help of grants released by ICAR.

In 1986, ICAR decided that the funds required for implementation of 'Lab to land' programme should be met from the Institute's budget. The programme was, however, discontinued by the Institute from October 1986 due to shortage of funds eventhough the programme had "a definite impact and left a permanent effect on the families" according to ICAR (December 1990). Discontinuance of such an important programme of transfer of technology to the farmers due to shortage of funds resulted in denial of research benefits to the society.

19.10. Accounts

19.10.1 Bank reconciliation

Bank debits to the tune of Rs.10.23 lakhs pertaining to the period between October 1987 and March 1990 were not accounted for. Non-accountal of debits in the Institute's accounts meant understatement of expenditure. ICAR in their reply (December 1990) stated that debit to the tune of Rs. 1.51 lakh have been cleared and action is in hand to clear the remaining amount.

19.10.2 Deposits with other departments pending adjustments

Of the deposits made by the Institute upto March 1990, Rs.187.56 lakhs were pending adjustment in August 1990. The details are:

Department	Amount outstanding (Rupees in lakhs)	Period to which relate
Central Public Works Department	182.81	1972-73 to 1989-90
Directorate General of Supplies and Disposals	4.42	1972-73 to 1987-88
Other departments	0.32	1984-85 to 1989-90
Total	187.56	

Out of the above, Rs.32.45 lakhs related to the period prior to 1982-83 and some were more than 15 years old. Of Rs.4.42 lakhs deposited with the Directorate General of Supplies and Disposals, Rs.2.11 lakhs related to cases where either the supply orders were cancelled or stores were not supplied. The remaining amount of Rs.2.31 lakhs was unspent balance of deposits made for which supplies had been received long back. The Institute stated that refund claims have already been submitted.

19.10.3 Unadjusted contingent advances with departmental officers

An amount of Rs.11.68 lakhs paid to various officers of the Institute for purchase of stores and other purposes during the period 1970-71 to 1989-90 was pending adjustment in August 1990. These advances were required to be adjusted immediately after the completion of work or purchase of stores but not later than 30 days. However, some of the advances were more than 18 years old.

20. Delay in commissioning of cold storage plant

Indian Institute of Horticultural Research, Bangalore constructed a building with two portions - one for accommodating microbiology, post harvest technology and plant genetic resource divisions and the other requiring air conditioning etc. for germplasm and seed pollen bank for research activities. The building was completed in August 1983 at a cost of Rs.12.52 lakhs by the Central Public Works Department (CPWD). For providing and installation of cold storage equipment in that building, two estimates for Rs.11.43 lakhs and Rs.8.29 lakhs were prepared by CPWD. Indian Council of Agricultural Research (ICAR) issued sanction for the

estimate amounting to Rs.11.43 lakhs in August 1979 and kept the other estimate pending. Later on, both the estimates had to be revised by CPWD, with a view to incorporate certain additions and modifications to the original specifications at the request of the Institute, to Rs.20.53 lakhs. Sanction was issued by ICAR for the revised estimate in February 1982. CPWD awarded the work to a firm in Bangalore, in October 1983, with a time limit of five to six months for completion of the work. Due to leakage in the roof of the germplasm and seed pollen bank building during rains, additional water proofing treatment over and above the special water proofing treatment was provided in 1987 at a cost of Rs.0.42 lakh.

After a delay of more than five years the cold storage plant was commissioned in January 1990.

The Institute stated, in July 1990, that the agreement was executed between the CPWD and the firm and the Institute had no role in the work though they had pursued with the CPWD for early completion of the work. This view was endorsed by the ICAR in November 1990.

The delay in commissioning the plant resulted in blocking of funds to the tune of over Rs.20 lakhs for more than five years.

21. Avoidable expenditure on hiring of accommodation

In July 1981, the Indian Council of Agricultural Research had hired 2451 sq.ft. of accommodation at Okhla from Central Warehousing Corporation (CWC), for the purpose of storing printing paper etc. at the rate of Rs.2.50 per sq.ft. per month plus insurance charges at 2.5 per cent of the cost of paper stored. From October 1984, the area was reduced to 2400 sq.ft. and the monthly rent enhanced to Rs.3 per sq.ft. The rent was further revised to Rs.5 per sq.ft. from April 1987. The insurance charges were also revised from 2.5 to 3 per cent from June 1988.

In June 1985, the Publication Division was shifted to its new building at Pusa complex where sufficient accommodation for storing printing paper, etc. was available. The Council, however, continued to retain the hired accommodation at Okhla and it was only in June 1988, that Central Public Works Department was awarded the work of conversion of basement and garages at Pusa complex into storing place for paper, at an estimated cost of Rs.0.28 lakh. The store was finally shifted to Pusa complex in September 1988.

Thus, the Council had incurred an avoidable expenditure of Rs.4.36 lakhs on rent and insurance charges during June 1985 to August 1988.

The Council stated, in September 1990, that when the building was completed, the area allotted to them was found insufficient to accommodate their officers and staff and also to keep their valuables mainly due to the expansion of the Publication Division in the meanwhile Therefore, they continued to retain the CWC godown. In November 1988 it was however stated by the Council that the basement which was earmarked for storing printing papers, etc. could not be used as there was the problem of water leakages and absence of fire extinguishers. It was also mentioned by the Council in March 1989 that it was subsequently felt that the paper store could be shifted by converting a portion of the car parking area in the new complex. Had this decision of conversion, which was executed in three months, been taken earlier, payment of rent could have been avoided.

22. Non-utilisation of farming machine

National Bureau of Plant Genetic Resources, New Delhi procured one self propelled tool carrier "Hege-75" alongwith seed drill fertilizer distributor and a cultivator from a foreign firm at a total cost of Rs.4.84 lakhs, for efficient and timely conduct of farm operations. The machine cleared from docks on 23rd March 1988 after paying Rs.0.41 lakh as wharfage/demurrage charges was received in April 1988 and placed at the disposal of Issapur farm but could not be put to use as the Indian agent of the firm failed to calibrate and demonstrate the working of the machine. The Indian agent informed the Bureau that they would be able to demonstrate the functioning of the machine only after the calibration chart and working procedures were obtained from the foreign firm. Even after three years of procurement of the machine, it has not been put to use, with the result that the farm operations proposed to be undertaken had not materialised.

The Bureau accepted the facts and stated, in March 1990, that since the Indian agent of the foreign firm had failed to demonstrate the functioning of the machine in the absence of calibration/information, it was not possible to utilise it for sowing purposes.

The matter was referred to the Indian Council of Agricultural Research in July 1990; reply has not been received (March 1991).

Ministry of Communications

Department of Telecommunications

23. Centre for Development of Telematics

23.1 Introduction

Centre for Development of Telematics (C-DOT) was set up as a society on 25th August 1984 to undertake initially the development of the next generation of digital switching system and to undertake further research and development (R&D) for introduction of integrated services digital network (ISDN). C-DOT was initially set up for three years with an outlay of Rs.35 crores. This phase of three years was called the First Technology Mission. The Second Technology Mission, from August 1987 to March 1990, was approved with an outlay of Rs.32 crores. In May 1988, C-DOT was made a permanent society.

At the time of its formation C-DOT was placed under the Deparment of Electronics. In June 1989, C-DOT was transferred to Telecommunications Commission under the Ministry of Communica tions (Department of Telecommunications).

23.2 Scope of Audit

Audit of C-DOT is done under Section 14 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The functioning of C-DOT since its inception and upto May 1990 was reviewed by Audit.

The draft review was issued to the Department of Telecommunications in September 1990 seeking department's accept ance of facts and/or comments. The department's reply furnished in February 1991 has been taken into account while finalising this review.

23.3 Organisational set up

23.3.1 Background

For telecommunciation switching system, India had been dependent on foreign technology. Foreign collaboration began in 1950 with Strowger exchanges followed by Penta Conta Cross Bar exchanges in 1965. The Sarin Committee, set up in 1981, had recommended that future switching systems for India should, be digital. The Committee had observed that there was no research and development institution in India doing research on digital switching system.

According to a note for the Cabinet submitted by the Department of Electronics, in January 1984, the total requirement of switching equipment during the eighties, as per the feasibility report of Indian Telephone Industries (ITI), indicated the necessity for establishing a third factory for manufacture of digital Electronic Switching System (ESS), during the Seventh Plan period, as per details given below:

	1985-90 Period (In lakhs of lines)
Total requirements	76.53
Total availability (including ESS-I factory)	45.92
Total availability (ESS-I and ESS-2 factories established together)	64.42
Total availability (ESS-2 established one year later than ESS-I)	59.92

It was also mentioned in the note for the Cabinet that establishment of ESS-3 factory during the Seventh Plan period was essential as otherwise a gap of 16.61 lakh lines with resultant import of nearly Rs.500 crores would occur.

E 10 B French switching technology had been adopted for the first two ESS factories (ESS-1 and ESS-2) having a production capacity of 500,000 lines each, to be set up in the country by Indian Telephone Industries (ITI) in collaboration with CIT-Alcatel of France. (ESS-1 was set up in 1983-84 at Mankapur and Palghat — ESS-2 has not yet been set up.)

In an examination carried out by the Department of Electronics, it was felt (August 1982) that although foreign collaboration in this field might have significant advantage, it suffered from many drawbacks and it was necessary to indigenously develop the technology and design the system and for that purpose a national centre could be set up. Subsequently, a Committee of Secretaries, came to the following conclusions (July 1983) :-

(i) There is no need to have two technologies for our telecommunication system and two parallel streams of research. While Telecommunication Research Centre (TRC) would absorb and develop technologies based on the French system, the proposed National Centre would concentrate research efforts on a basically indigenous fully digital system.

(ii) The third ESS factory could be based on the successful development of new in-

digenous technology by the National Centre.

23.3.2 Approval for National Centre

Department of Electronics proposed, in January 1984, the establishment of a National Centre for technology development of electronic switching system. The Cabinet gave its approval in February 1984 as under:

(i) Setting up of a National Centre to undertake initially the development of the next generation of digital switching system as per the then requirements of Ministry of Communications and other users and subsequently to undertake further research and development (R&D) for introduction of Integrated Services Digital Network (ISDN). The indigenous design and development effort would ensure that indigenously available components were used to the maximum possible extent to reduce foreign exchange outflow to the minimum.

(ii) The third switching factory, ESS-3, would be established based on the technology to be developed by the National Centre within a period of three years.

(iii) Registering the National Centre as a scientific society and vesting it with total authority and flexibility, outside Government norms, was necessary to ensure dynamic operation. Special procedures would be established, particularly in such critical matters as allocation and release of foreign exchange both for travel and acquisition of equipment/components, issue of import clearance/licenses etc., so that delays in this regard did not affect the execution of the time bound projects at the National Centre.

(iv) Incurring an expenditure of Rs.35 crores, including a foreign exchange component of Rs.20 crores for the initial development of the next generation of digital switching system for manufacture in the new ESS factory, ESS-3.

23.3.3 Formation of C-DOT

The National Centre was set up as a society on 25th August 1984 as "Centre for Development of Telematics (C-DOT)". It was expected that the technology for ESS-3 would be indigenously developed by C-DOT and would be two generations ahead of E 10 B. The field trial was to be conducted by August 1987 and productionisation stabilised in another 2 to 2 1/2 years, i.e., within the Seventh Plan period.

23.3.4 Objectives

Operational Requirement (OR) and Qualitative Requirement (QR) for the digital electronic switching system to be developed by C-DOT were finalised in December 1984 after mutual discussion between the Department of Telecommunications and the C-DOT. Some of the salient features were **(a)** the local exchange to be developed should be capable of being extended to a minimum capacity of 500 lines and to a maximum capacity of at least 40,000 lines; **(b)** soft-ware for this system should be written in high level language CHILL and should be modular and structured. For an exchange of 40,000 subscriber lines capacity, the general technical spcification prescribes 20 Busy Hour Call Attempts (BHCA) per subscriber, with holding time of 45 seconds. To achieve this, the processor capacity of the system should be 800,000 BHCA.

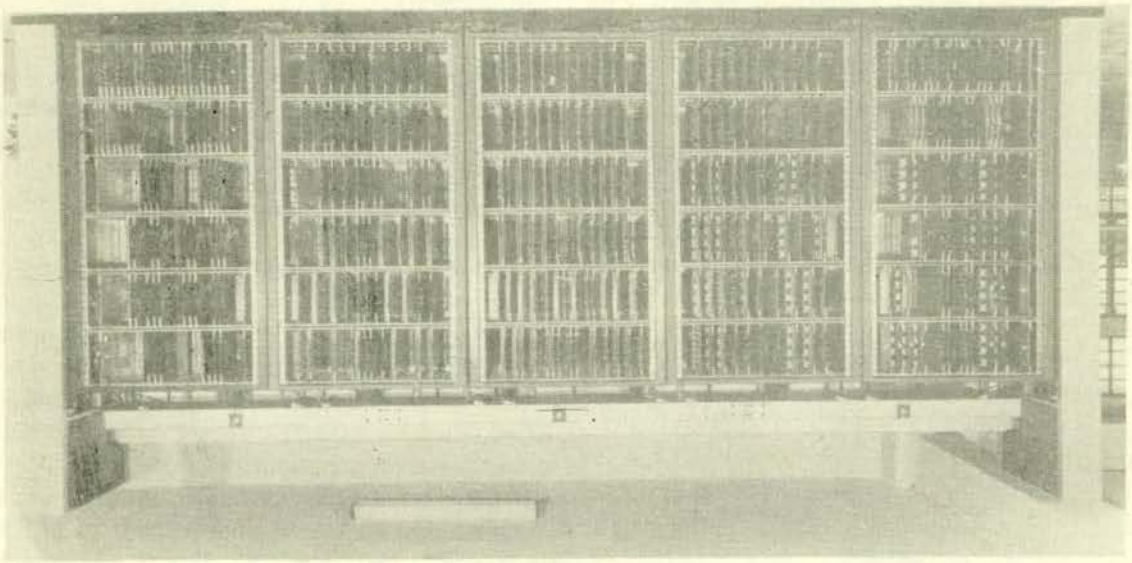
During the system architecture presentation to Department of Telecommunications, in November 1984, a consensus was arrived at that at least 20,000 lines at 20 BHCA/line should be provided by the system. The Department considered development of a 40,000 line exchange as a 'really diffcult and ambitious task'. It was agreed that initially software would be written in 'C' language as compiler and other software development tools were not available off the shelf for CHILL. Development of such tools would hamper the progress of this time bound project and it would be extremely difficult to meet the time target. However, parallel development in this respect would be pursued right from the start for meeting the CHILL requirement.

In March 1985, C-DOT planned for a 16,000 port exchange which could cater to 13,000 subscriber lines. This deviation was not brought to the notice of the Department of Electronics and the Department of Telecommunications at that stage.

In an assessment made in May-June 1986, it was indicated that the actual BHCA capacity of the exchange would be known only when the field trials were carried out. The 16,000 port exchange could approximately take 13,000 subsriber lines and the processor was designed for 260,000 BHCA. The exchange would be built up in units (32) of 512 port upto 16,000 ports with

the help of a central module having a capacity of 260,000 BHCA. In a subsequent estimate of May 1988, it was assessed that the theoretical overall capacity of the system could be expected to be around 180,000 BHCA as against 260,000 BHCA projected in June 1986.

In a note for the Cabinet, submitted in March 1988, C-DOT mentioned **inter alia** the following as its 'main accomplishments' during the phase of three years which was termed as ***'First Technology Mission'***:



The Proposed 16,000 - Port MAX

(i) design, development and installation of 128 port EPABX (Electronic Private Auxiliary Branch Exchange) and RAX (Rural Automatic Exchange);

(ii) installation of 512 port MAX (Main Automatic Exchange) at Delhi;

(iii) partially equipped 7000 port exchange on which field trials to commence by first quarter of 1988 at Ulsoor exchange at Bangalore ;

(iv) developing of CHILL tools in progress; and

(v) starting of CCITT (Committee Consultative International Telephone and Telegraph) No.7 signalling system implementation on C-DOT DSS.

The Cabinet approved ***'Second Technology Mission'*** in March 1988, for three years from 25th August 1987 to 31st March 1990 with a financial outlay of Rs.32 crores. The thrust activities assigned to this mission were as follows :

(i) to expedite bulk production of the indigenous digital switching systems, developed during the first mission, to meet the rural and urban requirements of the country;

(ii) to broaden the digital switching system family to include Remote Switching Unit (RSU), Trunk Automatic Exchange (TAX) and large Private Branch Exchange (PBX);

(iii) to introduce telematic or ISDN facilities in C-DOT digital switching products, including

development of CCITT No. 7 signalling system, to support services like data, teletext, videotext etc., and extension of digital connectivity from C-DOT exchange to subscribers' premises as per CCITT recommendations; and

(iv) to continue the vendor development of components and piece parts to ensure minimum foreign exchange outlay for commercial production of C-DOT products.

In March 1988, Cabinet also accorded approval for C-DOT to be established as a permanent scientific society for continued efforts in the direction of development and engineering of telematic technlogy, products and services.

Though the time frame for the second mission was over, subsequent plans of C-DOT were yet to be made and approved (July 1990).

C-DOT could not achieve the objective of developing a 16,000-port exchange by August 1987 even during the second mission ending March 1990. Due to non-development of C-DOT technology, there is a gap between the requirement and development of local switching equipment.

Department of Telecommunications stated, in February 1991, that the gap in the requirement due to the non-availability of C-DOT technology during the Seventh Plan was about four percent only (about 1.68 lakh lines) compared to the overall shortfall of 27.58 lakh lines. It stated further that with the development of C-DOT technology to meet the demands upto 10,000 lines exchange capacity, the shortfall in meeting the requirements of the Eighth Plan can be considerably reduced.

Till March 1990, 15,800 lines of C-DOT equipment (180 units of 128 port RAX) had been commissioned. The Department of Telecommunications stated, in February 1991, that about 1500 units of 128 port RAX were expected to be commissioned in 1990- 91.

The development of technology by C-DOT has been dicussed in para 23.5

23.3.5 Management

A three-tier management system for C-DOT had been laid down by the Cabinet viz. Governing Council, Steering Committee and Project Board.

The Governing council, the highest level, is headed by the Minister of Communications and has, among other members, representatives at Secretary level from Cabinet Secretariat, Ministry of Finance, Department of Telecommunications, Department of Electronics, Planning Commission etc. It is entrusted with annual review of the activities of C-DOT.

The Steering committee, the second level of management, is headed by Secretary, Department of Electronics and has among other members, representatives from Department of Telecommunications, Department of Expenditure, Department of Economic Affairs, Defence R&D, Department of Space etc. This committee is responsible for management of C-DOT and taking all necessary decisions. It is required to meet quarterly.

The Project Board, third level of management, is headed by the Executive Director of C-DOT with two other full-time Directors as members. It is directly responsible for technical and administrative activities of the organisation and is supported by functional line managers in-charge of various responsibilities identified for the project. The Board is to meet once in a month.

23.3.6 Manpower

The note submitted to the Cabinet in January 1984 indicated a requirement of 250 'professional' (R&D) and 100 'non- professional' (support) staff besides three directors for C-DOT. In the note for the Cabinet seeking approval for the second mission, in March 1988, the requirement was shown as 350 'R&D staff' and 150 support staff.

The R&D staff had increased from 312 in 1986 to 346 in 1989 registering a 11 per cent increase, while the support (non- professional) staff had increased from 105 to 178 registering 70 per cent increase. C-DOT being a scientist oriented R&D organisation should keep the support staff to the minimum by automating the office procedures. But, the proportion of support staff had been rising since the inception of C-DOT.

C-DOT had succeeded in creating a reservoir of young (average age about 30 years) and talented scientists for research and development activities in the field of digital switching system. There was high level of motivation and enthusiasm among the scientists and other staff. Added to these were increased use of personal computers, less of file and paper work etc.

23.3.7 Chicago cell

The Cabinet, while approving the formation of C-DOT in 1984, had cleared a proposal for locating a small team of about five members of C-DOT at Chicago, USA, for interfacing with the engineering consultancy firms to ensure speedy transfer of technology for selected areas

of the unpacked ESS technology. It was further approved that the duration and composition of the team could vary according to the specialised activities. The cell was opened in February 1985. Prior to the opening of the cell, C-DOT had engaged a private firm called Martek Inc. for the liaison work. Martek Inc. was reimbursed US$ 2891 (Rs.0.50 lakh) on account of the services rendered by them upto February 1985. C-DOT had incurred an expenditure of US $4.08 lakhs (Rs.69 lakhs) upto March 1990 for running the Chicago cell. Out of this, US $1.92 lakhs (Rs.32.5 lakhs) were reimbursed to Martek Inc. on account of telephone and telex charges, salary, insurance, travel and office expenses for the period February 1985 to March 1990.

Department of Telecommunications stated, in February 1991, that operating through the assistance of Martek Inc. helped C-DOT in reducing the expenditure on the liaison cell in USA and the Chicago cell was managed by one USA based person instead of 5 to 6 India-based persons originally envisaged.

23.4 Financial outlay

Financial outlay for C-DOT was initially proposed for the first three years when the project was sanctioned and sub sequently for another three years when C-DOT got clearance for the second mission. Based on proposals of C-DOT, Government of India sanctioned grants as under, for the years 1984-85 to 1989-90:

(Rupees in crores)

First mission	1984-85	1985-86	1986-87	Total
In Rupees	4.93	5.39	4.77	15.09
In foreign exchange	8.20	10.11	1.58	19.89
Total	13.13	15.50	6.35	34.98

Second mission	1987-88	1988-89	1989-90	Total
In Rupees	10.10	7.90	9.00	27.00
In foreign exchange	0.90	2.20	1.90	5.00
Total	11.00	10.10	10.90	32.00

Actual grants received were Rs. 35.01 crores for the first mission during 1984-87 and Rs.32 crores for the second mission during 1987-90. Besides, C-DOT earned a revenue of Rs. 3.69 crores during April 1984 to March 1989. The expenditure incurred during 1984-85 to 1988-89 was Rs. 56.44 crores (including net current assets figures of Rs.2.53 crores) and Rs.3.96 crores were in bank at the end of the financial year 1988-89.

Department of Telecommunications stated, in February 1991, that the total expenditure in both the missions upto March 1990 was Rs.73 crores (approximately).

C-DOT had an un-spent balance of Rs.5.00 crores out of the grants released during the first mission and was also required to generate internal resources to the extent of Rs.1.00 crore. Therefore its budgetary demand was for Rs.26 crores. However, it received Rs.32 crores. Thus, an amount of Rs.6.00 crores had been released in excess.

23.5 Technology development

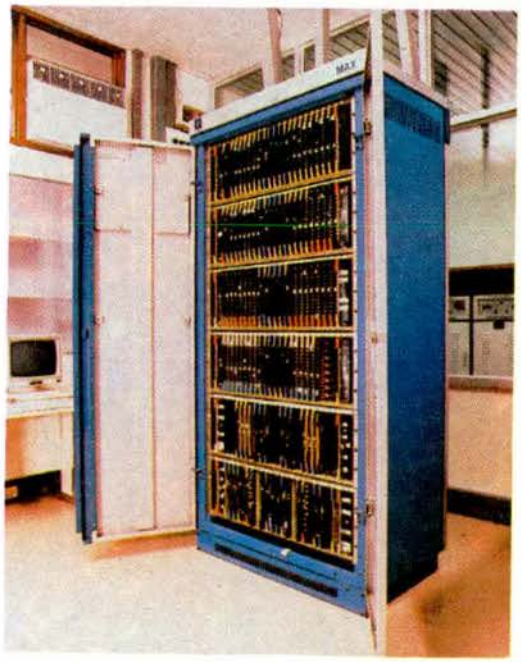
23.5.1 Technique

Technology developed by C-DOT is built around a 512- port Base Module (BM) to be interconnected in multiples of 512-port BM by Central Module (CM), Administrative Module (AM), Input-Output processor (IOP) etc. (fig.1). The base module consists of four 128-port Terminal Units (TU) (fig.2). For a 128-port TU to work as an independent exchange, it has to be provided with some sub-systems for intra coordination (fig.3). Similarly, for an independent 512-port exchange, a single base module has to be provided with some sub-systems for intra coordination (fig.4).

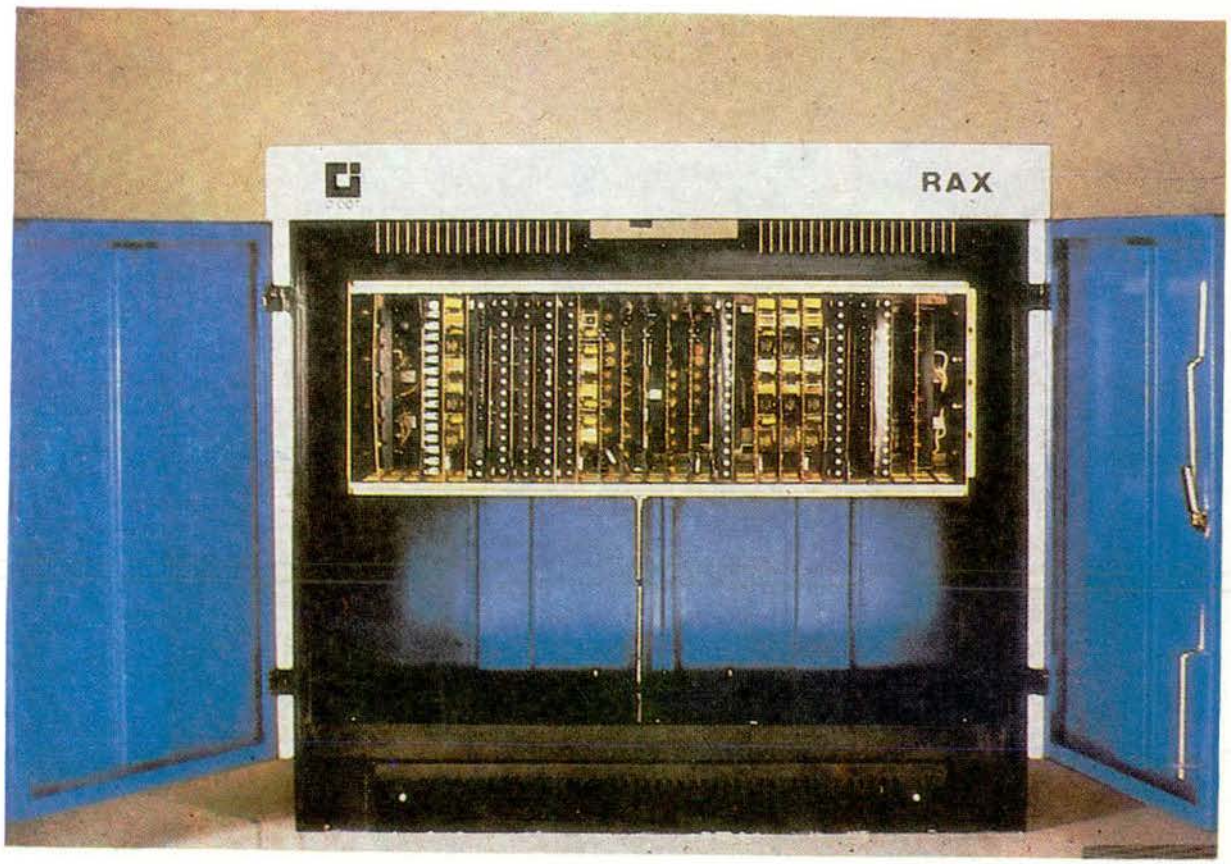
The Central Module (CM) which is essential for co-ordination between various base modules has a Space Switch Controller (SSC). The capacity of this SSC developed by C-DOT would limit the BHCA capacity of a multi base module exchange. Also the exchange capacity of Input Output Processor (IOP) - required again for coordination in multi base module - has a design limitation. The present proto-type built by C-DOT can only cater to exchanges upto 5000 lines(without concentration) and can use only 16 base modules.

23.5.2 Main Automatic Exchange (MAX)

MAX at Delhi : One 512-port MAX was installed in Delhi in June 1987. This was integrated with Delhi telephone network in January 1988 and 21 subscriber lines were given. In a phased manner the lines were increased to 345 subscriber lines in August 1988. This exchange was of experimental nature and was being used by C-DOT for planting softwares and testing them. Mahanagar Telephone Nigam Limited (MTNL), Delhi had not yet agreed (August 1990) to take this exchange as its capacity was too small for a network like Delhi. The operational requirement and qualitative require-



512 PORT MAX



128 PORT RAX

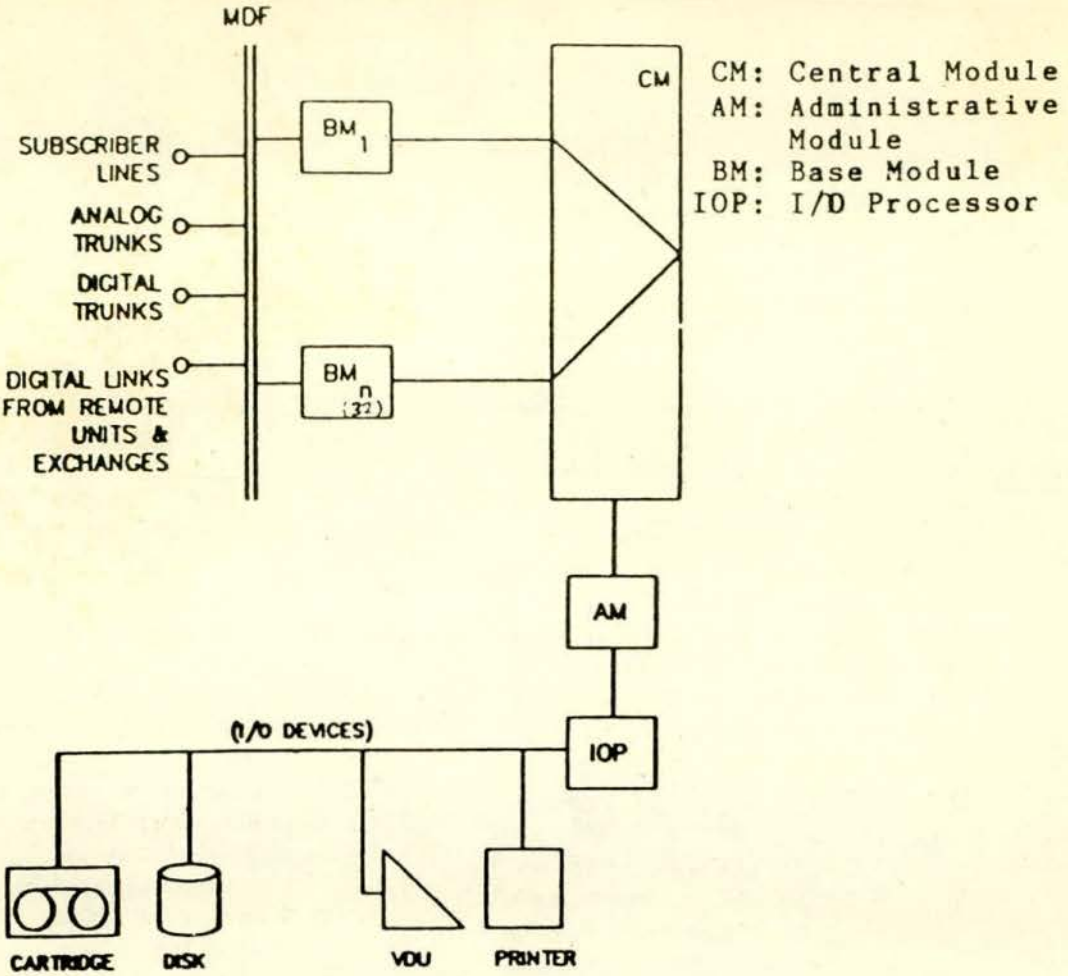


Fig.1 Multi Module Exchange

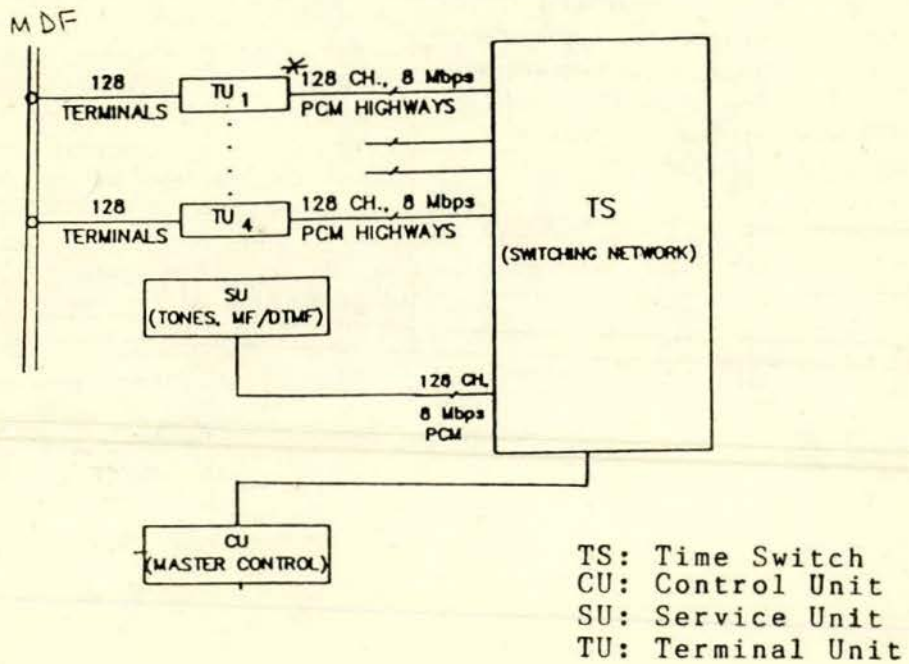


Fig.2 Base Module (RM)

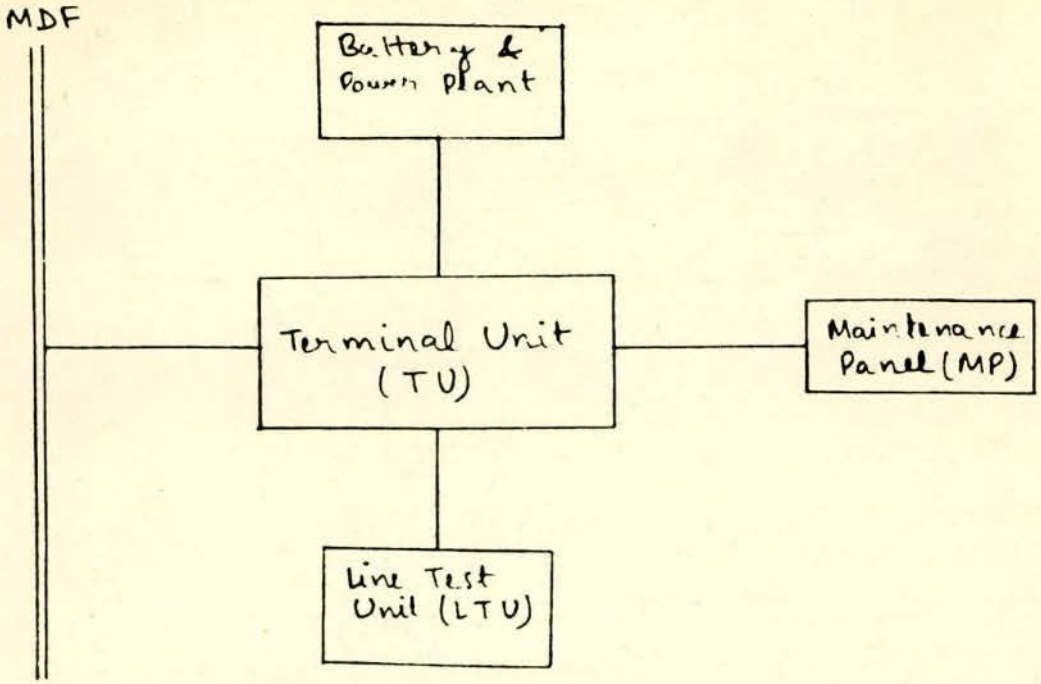


Fig.3 128-P RAX (Rural Automatic Exchange)

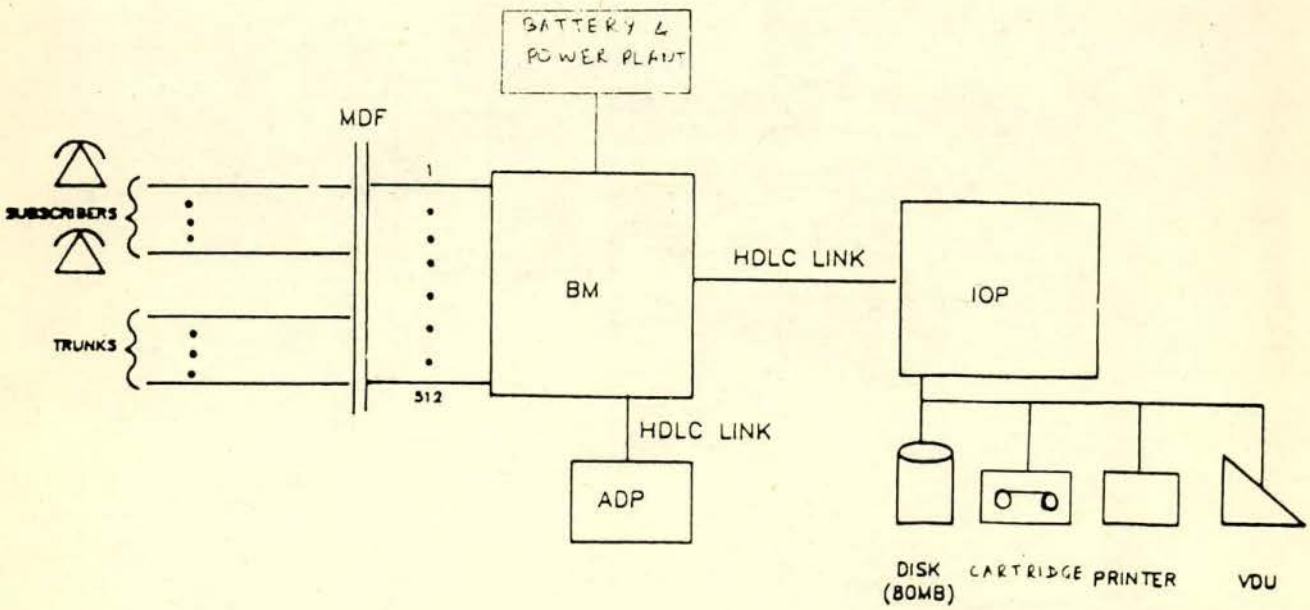


Fig.4 Single Base Module Exchange

ment (OR/QR) of this exchange were found adequate after giving minor relaxation. The system had not yet been given technical clearance by Department of Telecommunications.

MAX at Ulsoor: Ulsoor exchange (Bangalore) was brought into commercial service in August 1989 with two base modules and of 800 lines (638 connections). In October 1989, four more base modules were added raising the total line capacity to 2,400. 2,320 sub scribers were connected with a maximum of 13,200 BHCA. No further extension had been made to the exchange. However, four more base modules were stated to be available for future expansion. Department of Telecommunications informed, in August 1990, that the exchange at Ulsoor was being maintained by C-DOT and this system could be taken over by them only when the technical details were frozen and after watching satisfactory performance of this exchange with increased loading. They also added that this exchange did not completely meet the OR/QR of Department of Telecommunications.

With neither of the two exchanges technically cleared by the Department of Telecommunications, the basic product of C-DOT was still under trial. The prototype built by C-DOT could only cater to exchanges upto 5000 lines. Thus, the delivery of the technology for 16,000 line exchange in the near future was uncertain (January 1991).

23.5.3 By-products

C-DOT embarked upon development of 128-port and 512-port independent exchanges as branch project (by-products of the main activity). 128-port exchange unit had been productionised for use as 128-port RAX (Rural Automatic Exchange) and 128-port PABX (Private Auxiliary Branch Exchange).

23.5.4 Rural Automatic Exchange (RAX)

Field trials of the pilot model of RAX was to start by the end of March 1986. The pilot model was installed at Kittur (Karnataka) and field trials commenced in July 1986. It was offered for environmental testing in August 1987, and clearance was expected by December 1987. The technology was given clearance in August 1988 for production but formal clearance was issued in December 1988.

23.5.5 RAX-A-DAY programme

Based on the progress, the Department of Telecommunications, in consultation with C-DOT and ITI, decided in December 1987 to launch a programme, 'RAX-A-DAY', with the objective to put into service one C-DOT 128-port RAX per day in the net-work from 31st March 1988 for making available the benefits of C-DOT technology for rural communication. The programme involved installation of 400 RAX in 1988-89.

As a number of licensees had expressed their difficulties in procuring power plant and transmission equipment from outside sources without which commissioning of the rural exchanges was difficult, the Governing Council suggested, in March 1989, that feedbacks from the field should be studied by an independent party and report submitted to the Governing Council in its next meeting. It was, however, noticed that the developments made in the matter had not been brought to the notice of the Governing Council in its meeting held in July 1989 nor was it included in the agenda for the meeting to be held in May 1990, which was not held.

In a meeting of the Governing Council held in October 1988, dissatisfaction was expressed over the slow progress of RAX-A-DAY programme and an immediate review was suggested to find ways and means to expedite the programme. Problems of ITI in obtaining the industrial licence and procuring imported components for RAX, were also pointed out alongwith the delays in import clearance from Director General, Technical Development (DGTD) and delays in procurement of components by Electronic Trade and Technology Corporation (ET&T). The Chairman of the Governing Council felt that advance action should have been taken for procurement of materials since the above difficulties were known. It was decided that the entire process of procurement of components would be reviewed as also the status of RAX-A-DAY programme. However, action taken in this regard was not indicated in the agenda of subsequent meetings of the Governing Council held in March and July 1989. There was also no mention of the programme in the agenda for the meeting to be held in May 1990, which was not held.

Department of Telecommunications stated, in February 1991, that there were problems regarding the industrial licence and imported components but with the technology transfer completed to 15 manufacturers, no problem in the licensing as well as component procurement was observed, and by May 1990 there was confidence that the manufacturers would be able to meet their target.

According to Department of Telecommunications, only 180 units of 128-port RAX had been commissioned (August 1990). The Department also stated, in February 1991, that the programme for 1990-91 was for installation of 1500 RAXs.

23.5.6 Trunk Automatic Exchange (TAX)

One of the objectives of C-DOT in the first three years was to develop a Trunk Automatic Exchange (TAX). In the second mission, it was stated that C-DOT would undertake design and development of TAX from March 1988 and field trials for this product would commence in March 1989. During the remaining period of the second mission, activities pertaining to productionisation and technology transfer of these products were to continue. No progress had been made so far (January 1991).

Department of Telecommunications accepted, in February 1991, that the development of TAX had been delayed but mentioned that a small TAX had been put for field trial recently at Ambala.

23.5.7 Integrated Services Digital Network (ISDN)

C-DOT was set up to undertake initially development of the next generation of digital switching system and subsequently further R&D for introduction of Integrated Services Digital Network (ISDN) by August 1987, which would be the main vehicle for future ISDN services. In August 1985, the Steering Committee directed C- DOT to set up a seperate exclusive group to commence activities on ISDN to lay the foundation for future ISDN services. C-DOT informed the Governing Council in August 1986 that the group had been finalised and first field trial was scheduled towards the end of 1988. Laboratory trials for ISDN circuit switched voice/data were to be conducted in 1989. No development in this regard had taken place (July 1990).

Progress on this important activity did not figure in the agenda for the Steering Committee and the Governing Council. The matter was not discussed in any of these meetings.

Department of Telecommunications stated, in February 1991, that ISDN activities had been initiated by C-DOT and laboratory experiments were in process.

23.5.8 Conversion of 'C' language to high level language CHILL

The Governing Council was informed, in August 1985, that the initial development of software for the system being developed by C-DOT would be in 'C' language and subsequently converted into CHILL. The Chairman of the Governing council had directed then that the issue of use of CHILL in the development of software for digital switching system should be finalised before production started and advised C-DOT to take parallel action in this regard. The Governing Council was informed by C-DOT, in December 1985, that contract had been signed with Tata Research Design and Development Centre (TRDDC), Pune for parallel development activity on CHILL, the converter from 'C' language to CHILL would be ready by May 1987 and development of complete tool-set would be completed by December 1987. Subsequently, it was brought out that the tool set would be completed by October 1988 by TRDDC and software transfered to C-DOT MAX by March 1990.

TRDDC submitted in February 1986 a proposal alongwith a draft agreement for the project for 'C to CHILL converter'. The proposal was, not approved by C-DOT till January 1987 when TRDDC submitted a revised project proposal for CHILL Development Tool Project. The cost of the project was estimated at Rs.50 lakhs, which was negotiated to Rs.42 lakhs and an agreement was signed with TRDDC in April 1987.

TRDDC informed C-DOT in August 1988 that first version would be ready by end of that month. There was nothing on record to show whether and when the first version of compilers had been submitted to C-DOT and whether the testing had been done by TRDDC and what were the results thereof.

'C-DOT stated, in July 1990, that the package 'C to CHILL converter' had been delivered by TRDDC to C-DOT and that final payment of Rs.9 lakhs would be made after successful demonstration of all the components. But, it was not mentioned as to when the package had been received from TRDDC.

23.6 Sponsored Project - Parallel Computing System

Development and applications demonstration work in respect of Parallel Computing System was assigned to C-DOT by the Department of Science and Technology (DST) and a Memorandum of Understanding (MOU) was signed in March 1988. The MOU indicated **inter alia** that C-DOT would pay to DST a royalty fee of five per cent on all sales of various types of parallel computing systems, know-how, consultancy etc. for a period of seven years from March 1988.

The assignment was to be completed in 18 months from the date of signing the MOU, i.e., by September 1989, and the cost of Rs. 4 crores was to be borne by

DST. The project had not yet been completed (July 1990).

In January 1989, DST had asked C-DOT for a detailed document covering the technical and engineering aspects and financial expenditure till date vis-a-vis projections in the project document as no technical or financial monitoring had taken place till then. No such report was, however, sent by C-DOT except the documents relating to the review conducted in October 1989.

Department of Telecommunications stated, in February 1991, that all documents relating to techincal and engineering aspsects had been sent to the coordinator of the project and a set of these documents were also handed over to the Secretary, DST in November 1989. The Department added that audited statement would also be handed over to DST.

Till March 1990, DST had released Rs.263 lakhs to C-DOT and the latter had incurred total expenditure of Rs.195 lakhs leaving an unspent balance of Rs. 68 lakhs. Against the committed technology development fee of Rs.400 lakhs during a period of 18 months, C-DOT was able to absorb hardly half the amount in 27 months. Department of Telecommunications stated, in February 1991, that the design and development work was in the final stage of completion and would be completed by 1991 within the budget estimate of Rs. 4 crores.

The project had been undertaken by C-DOT though the progress in regard to its main activity was behind schedule. According to Department of Telecommunications (February 1991), C-DOT had gained expertise and it was a recognition of the expertise which was reflected in its getting the prestigious project from an outside organisation.

23.7 Consultants

23.7.1 The approved Project Implementation Plan of C-DOT had identified a number of grey areas in R & D and production of digital ESS which were proposed to be bridged by import of raw technology and consultancy. This plan document was prepared in March 1983. After this, in order to explore assistance of various multinationals, a team had gone abroad in May 1985. The team recommended, in their report submitted in June 1985, pure consultancy agreement with specialised firms/individuals and directed C-DOT to negotiate appointment of consultants in tune with their recommendations. The report mentioned a list of con sultants (mostly non-resident Indians), their scope of activity and terms of appointment. Except for the software consultant, who was to be engaged full time, the other consultants were to be engaged on hourly basis. One full time and tweleve part time consultants were appointed. Out of the total expenditure of Rs.189 lakhs on consultants upto Mach 1989, Rs.89 lakhs accounted for fee, reimbursement of income-tax, travel expenses and hotel charges of the USA - based full time consultant.

23.7.2 Full-time consultant

In June 1985, an agreement was signed between C-DOT and Shri R.D.Mehta a non-resident Indian appointing the latter as full time consultant for two years. The agreement included that (a) the consultant shall carry out assignments decided by C-DOT either in India or USA (b) payment to the consultant will be made at a rate of U.S. $ 8000 per month; (c) any income tax liable to be paid in India on the fees will be paid by C-DOT but any tax liability of consultant in USA will be borne by the consultant; (d) travel expenses incurred for carrying out the consultancy as signment shall be borne by C-DOT which included air travel (by economy class) between USA and India, within USA and local travel in India; (e) C-DOT would also pay living and other incidental expenses in India and (f) the consultant will submit a monthly report on the progress of assignment, specifically indicating the achievements against milestones prescribed by C-DOT. In March 1987, the Project Board decided to extend the agreement for six months upto 14th December 1987 on the same terms and conditions. As per the record of a meeting of the Project Board held in December 1987, Manager Software . ad felt that his consultancy services would be required/useful during the field trials of C- DOT MAX at Delhi and Ulsoor but might not be required on full- time basis. Accordingly the Project Board approved the extension of the consultancy for a period of six months to be spread over one year from 15th December 1987 to 14th December 1988. The consultant was engaged for six months during this period.

In the course of the consultancy contract, he was paid US $ 306,000 (Rs.41.64 lakhs). A sum of Rs.41.72 lakhs was also paid as income tax payable by him in India and Rs.5.50 lakhs were spent on his air travel and hotel expenses. According to the agreement, the consultant was appointed only from 15th June 1985, the date of signing the agreement but was paid to the extent of US $ 30,000 for the period 1st January to 14th June 1985. Department of Telecommuinications stated, in February 1991, that although the consultant was engaged through a long term contract with effect from 15th June 1985, he had been engaged for a specific assignment prior to 15th June 1985 for which payment

was released, independent of the contract signed in June 1985.

According to Master Schedule, field trial of 512 port PABX pilot model, which was to serve as the base module for subsequent exchanges to be developed by C-DOT, was to be completed by September 1986. Accordingly all software development for which the full time consultant was required should have been completed by this period.

According to the agreement, the consultant was required to submit a monthly progress report. It was noticed that neither the consultant was submitting the monthly progress report nor C-DOT had been asking for it. The actual position was never brought to the notice of the Steering Committee or the Governing Council. The Minister for Communications had observed in a meeting of the Governing Council, held in August 1985, that there should be a regular PERT chart of activities at least for the full time consultant. Accordingly a PERT chart for the period July 1985 to June 1986 was submitted to the Governing Council in its meeting in August 1985. But, no PERT chart was made for his subsequent extension and for the entire period from July 1986 to December 1988 nor any performance report was submitted to the Governing Council.

In course of discussions, C-DOT stated that the full time consultant was engaged primarily to give support in overall management of software technology development and his role was more of an advisor and catalyst in guiding people as against execution of specific tasks/assignments and his most significant contribution was that adequate competence had been built now to handle, manage, trouble-shoot and upgrade complex and large software based products. As regards PERT it was stated that basically the PERT of the entire software group was his PERT.

In a meeting of the Governing Council, held in August 1986, it was desired that a report on the activities, programmes and status of C-DOT consultants should be made indicating future plans for consultancy, whereever needed beyond the present man date. The Governing Council or the Steering Committee was, however, not kept apprised of the work done by the consultants despite their expressed desire. Department of Telecommunications stated, in February 1991, that the members of the the Project Board and the Advisor of C-DOT were also the members of the Governing Council and were always aware of the contributions made by the consultants from time to time.

23.8 Vendor development

C-DOT had launched a Vendor Development Programme by holding first Vendor Conference in January 1985 with a view to indigenise components used in various products being developed by C-DOT. The objective was to use indigenous components as already available in the design and also develop indigenously for the replacement of imported components duly ensuring quality and reliability. Components used in C-DOT's products could be used in other electronic items as well. As such, the vendor development programme would give a boost to the electronic industry.

There was no indication whether any trial orders or final supply orders were placed on 253 vendors stated to have been registered and whether the components had actually been supplied in accordance with C-DOT's requirements. C-DOT could not furnish any list showing the particulars of the components initially used for its technology and the components which were subsequently being manufactured by the vendors. Thus, the extent to which indigenisation had been achieved could not be ascertained.

Department of Telecommunications mentioned (February 1991) hybrid transformer, hybrid circuits and CODECS as some of the major components which have been developed as a result of vendor development and which are required in large numbers.

23.9. Transfer of technology

23.9.1 C-DOT embarked upon transfer of technology relating to 128- port PABX and 128-port RAX to new manufacturers, both in private and public sector, for production.

23.9.2 Transfer of technology fee and royalty were prescribed. An amount of Rs.2.25 crores for 128-port PABX had been collected as fee till March 1990 and a sum of Rs.33.50 lakhs was yet to be realised (July 1990). Further, an amount of Rs.12.81 lakhs had been collected as royalty for the technology till March 1990 from 14 licensed firms. Out of these 14 firms, seven firms had not paid any royalty after June 1988 and only three paid royalty during 1990. C-DOT was not keeping proper watch over receipt of royalty and did not know the extent to which production had been done.

23.9.3 Out of the 16 licensees in field for the first four versions of the PABX, only nine turned up for the fifth version and deposited the additional fee of Rs.0.75 lakh.

23.9.4 For RAX technology, 37 licensees had paid the first instalment of technology transfer fee till March 1990 out of which 17 did not pay the subsequent instalments. Out of the remaining 20 licensees, 15 had not yet paid the third instalment and out of the remaining five, only four had paid the fourth instalment. No royalty had so far been received. An amount of Rs.88 lakhs had been received as technology transfer fee till 1989-90 and an amount of Rs.16 lakhs was yet to be realised.

23.9.5 C-DOT had also embarked upon transfer of technology of a **higher version** of 256-port **PABX** for which a fee of Rs.1.50 lakh had been fixed but the terms and conditions to be attached with the transfer of technology had not been finalised. Twenty manufaturers were licensed for the transfer of this technology against whom fee, amounting to Rs.30 lakhs, was due. An amount of Rs. 9.25 lakhs had been recovered till March 1990 and Rs.20.75 lakhs remained to be recovered (July 1990).

23.9.6 As per information furnished by C-DOT in August 1990, 37 manufacturers had been registered for PABX, out of which 31 had made the prototype till June 1990, 30 had offered the model to C- DOT, TRC had evaluated the model in 27 cases and commercial production had been started by 25 manufacturers only.

Similarly, against 35 manufacturers registered for RAX, 22 reported to have made the prototype, 18 had offered the pilot model to C-DOT, production evaluation completed in 12 cases and commercial production started by 12 manufacturers.

23.9.7 No information could be made available regarding the PABX/RAX actually manufactured by each manufacturer. Thus, the extent to which royalty was due was not ascertainable. C-DOT was not keeping a watch on the realisation of royalty. The licensees were not furnishing any sales account.

23.9.8 No system had been evolved to assess the cost involved in development of each product. The fee charged for technology transfer had been fixed on an adhoc basis. It was stated by C-DOT in June 1990 that maintaining records separately for the sub- systems were not called for. But, as these "sub-systems" had also been adopted as independent systems for transfer of technology, separate costs for the same ought to have been worked out.

23.9.9 In its meeting in October 1985, the Steering Committee had desired that C-DOT should go in for patenting of its designs. The Committee was informed that action had already been initiated to engage a suitable patent lawyer. C-DOT stated, in July 1990, that patenting of designs had not been done but a group was in the process of documenting patentable designs and processes.

23.9.10 Department of Telecommunications stated, in February 1991, that the matter regarding royalty would be pursued by C- DOT.

23.10 Monitoring

23.10.1 PERT (Project Evaluation and Review Technique)

C-DOT adopted the technique of PERT charts to plan, monitor and complete its assignment. The development programme was broken into four major phases as under:

(i) System definition within six months

(ii) Design (hardware and software) within 15/18 months respectively

(iii) Prototype feasibility construction within six months

(iv) Manufacturing interface within eight months

In this connecion the following deficiencies were noticed:

(a) PERT charts did not indicate critical paths and there was no indication of monitoring with reference to the PERT charts.

(b) Though the milestones were to be reviewed after completion of design documents etc. revised PERT chart had not been made.

(c) Progress made from time to time was not in accordance with the master schedule or the PERT charts. Reasons for delay

in/failure to acheive the targets were not analysed for corrective measures and towards reallocation of resources.
(It was stated that progress made was communicated to the Steering Committee, Governing Council etc. from time to time. But these reports were in general terms and not activity- wise or target-wise).

(d) A number of changes had been made in the target dates but revised schedules had not been made.

(e) Although C-DOT was lagging behind in its schedule of activities, in the meeting of the Governing Council held in December 1985 it was stated that the technical activities were progressing in accordance with the master PERT schedule. Subsequently in the mid term Appraisal Report of March 1986 it was indicated that the project was on the dot though it was not so.

(f) Subsequent to the mid-term appraisal C-DOT had stopped preparing any PERT chart as was evident from the absence of any such chart in the annual plans made subsequently or in the agenda of the subsequent meetings of the Governing Council.

(g) After the initial PERT chart, another master PERT chart was made in early 1988 at the time of seeking approval for C-DOT's extension for another three years. In this phase also, although the progress was lagging far behind schedule, PERT chart was never revised. This indicated continued lack of requisite planning and monitoring of the project during the second phase.

Taking note of these observations, Department of Telecommunications stated, in February 1991, that due care would be taken by C-DOT while monitoring in future.

23.10.2 Design assignment procedure

In order to monitor the progress of each design activity, design assignment procedure was to be introduced under which each designer was to prepare a design assessment covering his area of responsibilities.

Bi-weekly group meetings were to be held to maintain communication between designers of different disciplines and to identify/eliminate interface problems. Monthly review meetings by the Project Board with the appropriate group to review the status of various activities were also prescribed. Each member of the group was required to prepare a brief weekly report outlining accomplishments of the week to the group leader who would summarise activities and accomplishments and submit it to the manager who would also prepare a weekly report for his depart ment. A final bi-weekly report would be prepared by the project management staff for the Project Board. All these reports would also be available in a central file system.

It was noticed that central file system was not being maintained for all the years. In the absence of records it could not be ascertained as to whether these meetings etc. had actually been held to monitor the activities. Some sample documents regarding assignment sheets, time sheets etc. were produced but these were only in respect of very few individuals and also for a very limited time.

Department of Telecommunications stated, in February 1991, that the modified schedules for various programmes were being worked out by the Project Board and these were proposed to be monitored closely.

23.10.3 Meetings of Governing Council etc.

The Steering Committee, which is responsible for mangement of C- DOT and taking all necessary decisions, was to meet quarterly. The Committee held 14 meetings during September 1984 to July 1989, which fell short of the prescribed frequency by 42 per cent. The Governing council, which is required to meet at least once in a year, met on 13 ocassions during the same period. Neither the Governing Council nor the Steering Committee had met after July 1989.

Thirty two meetings of the Project Board had been held since the inception of C-DOT till April 1989 when the last meeting was held. The Project Board was to meet every month and number of meetings held by them fell short of the prescribed frequency by 54 per cent.

Department of Telecommunications stated, in February 1991, that the Project Board often met informally in addition to formal meetings, however in future more attention would be given to formal monitoring.

23.11 Purchases

23.11.1 Purchase procedure adopted by C-DOT was broadly as under :-

(i) In respect of purchases costing beyond Rs.10,000 and upto Rs. 1 lakh, the procedure of obtaining quotation/enquiry from at least three dealers in the material should be followed.

(ii) In respect of purchases above Rs.1 lakh and upto Rs. 10 lakhs, limited sealed tenders should be invited and evaluated by tender committee comprising of indentor, Purchase Executive and Finance Executive.

(iii) In respect of purchases above Rs.10 lakhs, open tenders would be invited by giving advertisements in newspapers and tenders evaluated by tender committee comprising of Manager of indentor's department, Purchase Executive and Finance Executive.

(iv) For cases of deviations from the above laid down normal procedure of purchase, prior approval of Executive Director shall be sought bringing out clearly the reasons necessitating such deviations.

23.11.2 To avoid delay in import of equipment, free foreign exchange was provided to C-DOT by the Department of Economic Affairs and the Reserve Bank of India. Department of Electronics established a single point clearance for issuing custom duty exemption certificate for all types of equipment and stores imported by C-DOT for research and development purposes.

23.11.3 The following irregularities/deficiencies were noticed in the course of audit:

(a) An indentor while sending requisition to Purchase Department did not record on the indent the purpose of indenting the item.

(b) No reason for recommending a particular make or procurement from a particular firm was indicated nor was any proprietory article certificate, indicating that the firm on whom the order was recommendend to be placed were the sole vendor for the item required, attached.

(c) Purchase Department processed purchase of components on a single tender basis without verifying whether similar equipment/stores were available with any other source at competitive/reasonable rates.

(d) Purchases of equipment/stores of value exceeding Rs.10 lakhs were also mostly made without inviting open tenders and without clearly recording the reasons necessitating such deviation from the laid down procedure.

(e) After placing of the purchase order for equipment/stores, subsequent developments, viz., date of receipt of the materials, demurrage paid, certificate of receipt of material in good condition, reference of entry of the material in the stock register, the inspection notes of the equipment received, the details of payments made against the particular purchase order were neither recorded nor watched through respective files.

(f) Components/parts etc. were being purchased on the basis of indents from the individual users and consignments handed over to them without being routed through the stores or entering into stock register. There was no accounting of the stores handed over.

(g) No separate allocation of funds had been made for development of individual processes or items. The leaders of the concerned activity groups also did not know the funds allocated to them.

It was stated by C-DOT, in June 1990, that dynamic and flexible operations for purchases were provided in the bye-laws. While the need for liberal and flexible procedures in such organisation cannot be denied it is reasonable to expect that C-DOT follows the procedures laid down by itself. C-DOT further stated that items purchased on single quotation basis were of proprietary nature but there was no such indication in the records. C-DOT also mentioned that based on the tenders from manufacturers/Indian agents representing foreign suppliers, Tender Committee had decided cer-

tain vendors who were internationally renowned companies and C-DOT continued to make purchases from them. Some of these purchases had the approval of the Department of Electronics.

Department of Telecommunications stated, in February 1991, that now that C-DOT is stabilised as a permanent unit, the purchase procudure shall be met in future. It was also stated that instructions were being issued to ensure that the requirements of purchase procedure were complied with.

23.11.4 Purchase of televideo system and software: Martek Inc., USA had developed a system called Advanced Integrated Manufacturing System (AIMS) using its own software and integrated to the televideo system of another manufacturer. It was stated in a justification note of July 1985 that the software packages were required for production planning and materials requirement plan ning. It was said that such packages were not being developed by C-DOT and were required for future production planning.

Taking into account the requirements of Delhi unit also, C-DOT placed a purchase order with Martek Inc. in July 1985 for supply of televideo system, software, spares etc. at a total cost of US $ 1.52 lakhs (Rs.19 lakhs).

The consignment was received in India in September 1985 and Martek Inc. was paid US$ 1.60 lakhs including $0.08 lakh for additional spares and consumables. In addition, freight charges of US$ 5034 (Rs.0.63 lakh approximately), air fare etc., of serv ice engineers for installation and installation charges of US $ 10,000 (Rs.1.70 lakhs) were also paid.

Although it was stated that 12 firms had been contacted and a list of such firms had also been made, the prices of none of the firms were indicated. It is not clear as to how comparative study of costs was done. C-DOT stated, in June 1990, that advance system of this magnitude was not available in India and selection of parties was made out of the sales directory available in USA for parties marketing similar kind of software. Department of Telecommunications stated, in February 1991, that Martek Inc. was the only supplier which had agreed to provide the source code.

23.12 Stores

23.12.1 As mentioned in para 11.3(f), the components/parts etc. which were being purchased on the basis of indents from the in dividual users were handed over to them without being routed through the store register. Other indigenous/imported components purchased by C-DOT are stored at its Bangalore office. Day-to-day receipt and issue of the components was fed into the computer from 1986 but opening and closing balances were not worked out. Prior to 1986, no stock register was maintained. As a result, the stock position was not clearly ascertainable.

23.12.2 In the Auditors' Reports for the years 1985-86 to 1987- 88, the Chartered Accountant had been commenting that consumption of stores had been worked out by C-DOT on the basis of opening stock and purchases **less** closing stock. Physical verification of stores is undertaken to see that the items of stores as per the closing book balance (opening book balance **plus** acquisitions during the period **minus** issues during the period) are physically available. On the contrary, C-DOT was working out the consumption by adding acquisitions to the opening balance and deducting the closing balance arrived on the basis of physical stock taking. Obviously, this is no physical verification and does not serve the intended purpose.

23.12.3 In its Annual Report for 1988-89, C-DOT had stated that necessary steps were being taken to evaluate the itemwise details of stores issued to reconcile with the figure of total consumption. C-DOT is maintaining stock register from April 1990 in which the opening balance has been adopted on the basis of physical stock taking of the materials actually available in the stores.

23.12.4 Receipt and issue accounts of a few items for the year 1989-90 was furnished by C-DOT from which it transpired that 128 types of indigenous and imported components valuing Rs.28 lakhs were lying unutilised in stores for more than a year. Since figures for earlier periods were not available, items lying in the stores from the earlier years cannot be ruled out.

23.12.5 Material receipt register and material rejection register were required to be maintained to keep watch over receipt of material in full and in good condition, for replacement of rejected material and making good materials short received. It could also enable avoidance of any excess payment. C-DOT was not maintaining material receipt register for the period prior to September 1986 and material rejection register for the period prior to April 1987. After opening these registers, these were not maintained properly. As a result, it could not be checked in audit as to in how many

cases materials had been rejected/short received and whether rejected materials had been got replaced and short received made good subsequently.

23.12.6 Details of the assets acquired during a year were shown in a computerised statement. The progressive totals of the individual items were not exhibited in the computerised asset register. Physical verification of assets in Delhi was carried out by a team of two members in January 1990. In the absence of the progressive balances of individual assets, the team only pointed out the total number of individual assets actually available with C-DOT, resulting in a simple stock taking and not verification.

23.12.7 Department of Telecommuinications stated, in February 1991, that the question of streamlining store accounting was under review.

23.13 Summing up

- *The Centre for Development of Telematics (C-DOT) was set up in August 1984 as a national centre for research and development of a new generation of digital switching system. Based on the new technology to be developed by C-DOT within three years a new switching factory was proposed to be established.*

- *Initially, development of a 40,000 line exchange with provision for eight lakh Busy Hour Call Attempts (BHCA) was envisaged which was scaled down to 20,000 lines in November 1984 as designing a system of 40,000 lines was considered a 'really difficult and ambitious task'. C-DOT planned (March 1985) for 16,000 lines only at 2.60 lakh BHCA. The field trial was to be conducted by August 1987 and productionisation stablised in another 2 to 2 1/2 years, i.e, within the Seventh Plan period. In May 1988, it was realised that the theoretical overall capacity of the system could be expected to be around 1.80 lakh BHCA only.*

- *Delivery of the technology for 16,000 line exchange in the near future was uncertain. Against 16,000 lines exchange by August 1987, C-DOT could only commission a 512-port exchange with 345 lines at Delhi in August 1988. Another exchange with 800 lines was commissioned in August 1989 at Ulsoor (Bangalore) which was upgraded to 2,400 lines in October 1989. Neither of the two exchanges have got technical clearance of the Department of Telecommunications (January 1991). The basic product of C-DOT was still under trial. The prototype built by C-DOT could only cater to exchanges upto 5,000 lines.*

- *About 1.68 lakh lines were to be met by C-DOT type exchange equipment (128-port and 512-port) during 1988-89 and 1989-90 as stated by Department of Telecommunications.(Para 23.3) In 1988-89, 400 RAX were to be installed under RAX-A-DAY programme. Only 180 units of 128-port RAX (about 15,800 lines) were commissioned till end of March 1990.*

- *Objectives of C-DOT included development of a Trunk Automatic Exchange and undertaking R&D work for introduction of Integrated Services Digital Network (ISDN) which would be the main vehicle for future ISDN services. But, no work had been undertaken so far (January 1991) in this direction.*

- *DOT was to develop its technology in a high level language known as 'CHILL'. C-DOT entered into an agreement with Tata Research and Design Development Centre in April 1987 to develop software for 'CHILL' after which the technology developed in 'C' language would be converted to CHILL. The software was yet to be demonstrated.*

- *C-DOT took up, in March 1988, a project "Parallel Computing System" sponsored by Department of Science and Technology for Rs.4.00 crores for completion by September 1989. An amount of Rs.1.95 crores had been spent by C-DOT till March 1990 on the incomplete project.*

- *C-DOT engaged 13 consultants; one on monthly retainer basis and others on hourly basis. Out of the total expenditure of Rs.189 lakhs on consultants upto March 1989, Rs.89 lakhs accounted for fee, reimbursement of income-tax, travel expenses and hotel charges of the USA-based full time consultant. He was required to submit monthly reports on work done by him. He did not submit any monthly report nor did C-DOT keep any record of his achievements against the milestones as desired by the Steering Committee/Governing Council.*

With the objective of using indigenous components as already available in the design and further indigenous development for replacement of imported components, C-DOT had launched Vendor Development Programme. The components used in C-DOT's products could be used in other electronic items as well. Thus, the programme would give a boost to the electronic industry.

C-DOT had embarked upon independent systems of 128-port and 256- port PABX, 128-port RAX, 512-port MAX for transfer of technology for bulk producion by the licensees. No system had been evolved to assess the cost involved in development of each product. The details of staff deployed on each product and other inputs were not being kept and the technology transfer fee and royalty were fixed on ad-hoc basis. C-DOT had realised Rs.335.81 lakhs on account of technology transfer fee and royalty. A sum of Rs.70.20 lakhs already accrued on account of technology transfer fee had not been realised. Amount due for realisation on account of royalty could not be ascertained as C-DOT did not know the extent to which production had been done. None of the products had been patented.

- *C-DOT had adopted the system of Project Evaluation and Review Technique (PERT) to monitor its project activities. No attention was being paid towards achievement of targets as laid down in the PERT charts nor were the reasons for delay/failure to achieve the objectives analysed for corrective measures and towards reallocation of resources. Department of Telecommunications stated that due care would be taken by C-DOT while monitoring in future.*

- *Procedures had been laid down to allot activities to individuals and monitor their progress. The stipulated documentation was not maintained properly. Department of Telecommunications stated that modified schedules for various programmes were being worked out and these were proposed to be monitored closely.*

- *The Governing Council of C-DOT, which was to meet at least once in a year met 13 times in the six years upto July 1989. There were shortfalls, from the prescribed periodicity, in the number of meetings of the Steering Committee and the Project Board. Department of Telecommunications mentioned that the Project Board often met informally; however, in future more attention would be given to formal monitoring.*

- *C-DOT's purchase procedures were flexible but even these were not adhered to. While indenting for an equipment or components, indentors neither mentioned the purpose of the indent nor indicated the reasons for asking for a particular make. Materials were generally purchased on single quotation basis without proprietary article cerificates. Proper record of receipt of stores as regards quantity and good condition was not maintained. Department of Telecommunications stated that instructions were being issued to ensure that requirements of purchase procedure were complied with.*

- *Stores accounts had not been maintained properly. Prior to April 1990, no system had been developed to ascertain the total issues and receipts of individual items. Physical verification of stores and assets served no purpose as C-DOT was not working out the closing balances as per Stores Accounts with which the actual available stores/assets could be compared. Department of Telecommunications stated that the question of streamlining store accounting was under review.*

- *C-DOT had created a reservoir of young (average age about 30 years) and talented scientists for research and development acitivities in the field of digital switching system. There was high level of motivation and enthusiasm among the scientists and other staff. Added to these were increased use of personal computers, less of file and paper work etc. However, the staff position ratio of technical staff when compared with non- technical staff had been gradually decreasing.*

- *C-DOT was to fulfill its mandate in three years at a cost of Rs.35 crores. C-DOT was allowed to adopt liberalised rules and procedures to preempt hindrances to the time-bound programme. An extension by three years with additional outlay of Rs.32 crores was granted. After six years of its existence, C-DOT had not achieved the mandate, set out for the first three*

years, though procedures were liberalised and there was no problem of funds and foreign exchange.

Department of Telecommunications stated, in March 1991, that the task undertaken by C-DOT was to design, develop and productionise a sophisticated digital electronic switch with a specification of 40,000 lines capacity to handle 20 BHCA per line. They further said that even systems of lower capacity are known to have taken as long as six years even though fully established R&D facilities have been in full scale operation. As against this, C-DOT had started from scratch and set up an organisation of highly motivated young engineers to undertake the developmental activities. According to the Department, there are only 8 to 10 organisations in the world who have successfully developed digital switch technology on their own.

The Department added that all efforts were being made to remove the lacunae pointed out in the audit. It further stated that the modular approach adopted by C-DOT and progressive product development would result in bridging the shortage of switching equipment in the range of 500 to 10,000 lines in a quicker and more cost effective manner. On a conservative basis, these products will cover 50 per cent of the requirements in the country.

Ministry of Health and Family Welfare

Department of Health

Indian Council of Medical Research

24. Delay in installation of laser equipment

During 1986-87, Cytology Research Centre (now Institute of Cytology and Preventive Oncology), New Delhi decided to acquire a laser. A letter of credit (LC) was opened for Rs.12 lakhs in favour of a foreign firm in March 1987, with validity up to 31st March 1987. Funds for purchase of the equipment were provided by the Indian Council of Medical Research (ICMR). The order was subsequently cancelled as the firm did not supply the equipment by the prescribed date and funds got credited to the account of the Research Centre and retained by it.

In May 1987,it was again decided to purchase the equipment from another foreign firm for Rs.9 lakhs. The Research Centre requested the ICMR, in September 1987, to accord revised approval for purchase of the equipment which was conveyed in January 1988, subject to the condition that proper arrangements be made to utilise the equipment prior to its purchase. LC was opened for Rs.9 lakhs, in February 1988, which was guaranteed by a fixed deposit of Rs.9 lakhs. The order for supply of equipment was placed in March 1988.

The main equipment was despatched by the foreign firm in April 1988 and was cleared by the Research Centre in May 1988 after paying demurrage charges of Rs.0.05 lakh. The foreign firm despatched some left over items in July 1988 which arrived in August 1988. A demand for Rs.0.27 lakh towards demurrage charges was also received in October 1988.

The equipment could not be installed due to lack of proper space.

ICMR stated, in November 1990, that the installation was delayed due to non-availability of suitable space but had since been installed in the new building of the Sucheta Kripalani Hospital in July 1990. It was also stated that the equipment would be jointly used by the Institute and the Sucheta Kripalani Hospital.

Due to lack of proper planning, the equipment purchased at a cost of Rs.9 lakhs could not be put to use for more than two years.

25. Unproductive expenditure on instrument

Regional Medical Research Centre, Bhubaneswar had procured, in December 1987, one Backman high speed refrigerated centrifuge with accessories at a cost of Rs.4.50 lakhs from a foreign firm through their Indian agent, for separation of cells or cellular components for further bio-chemical or immunological analysis. No inquiry about the pre-installation requirements etc. had been made and the instrument could not be operated due to inadequate supply of electricity, rendering the investment of Rs.4.59 lakhs including the transportation and terminal charges of Rs.0.09 lakh, unproductive till June 1990, i.e., for over two and half years.

ICMR stated, in October 1990, that the instrument was temporarily made operational but could not be put to full use due to inadequate power supply in the temporary laboratory housed in a rented house. The instrument could be adequately used soon when the new building would be handed over by the State Public Works Department.

In another case, the Research Centre imported a blood cell counter, complete with thermal printer, double dilutor etc., in February 1987, for US $ 14,300 (Rs.1.88 lakhs). The instrument arrived at Calcutta airport in May 1987 and was cleared in September 1987 after payment of terminal charges of Rs.0.03 lakh. The instrument was installed on 4th July 1988 and it became non- functional after working for a brief period from 4th July 1988 to 28th July 1988 and from 3rd October 1989 to 23rd October

1989 (46 days). Only 309 tests could be conducted during the period. The service engineer of the foreign firm made several attempts to rectify the defects and make the instrument costing Rs.1.93 lakhs operational but in vain (June 1990).

ICMR stated, in October 1990, that the instrument became functional and was in working condition since September 1989. But this is at variance with the statement given by the Research Centre, in June 1990, that the equipment was not in fully functional state and lying useless since 8th January 1990 as the indented reagents which are required to test the blood samples is not supplied.

Thus, import of instrument worth Rs.6.50 lakhs had not achieved the desired objectives.

26. Non-installation of an imported equipment

Regional Medical Research Centre, Bhubaneswar placed a purchase order, in February 1988, for procurement of one virtis freezemobile from a foreign firm at a cost of Rs.1.49 lakhs. The letter of credit (LC) had been opened a year ago, on 28th February 1987, to avoid lapse of funds available for the financial year 1986-87. The delay in placing purchase order after opening of the LC was attributed, by the Research Centre, to the fact that considerable time had been taken in obtaining Customs Duty Exemption certificate. However, this certificate could have been obtained after opening LC but LC should not have been opened before placing the purchase order.

The equipment was received by the Centre at Bhubaneswar in May 1989. The foreign firm was requested through their Indian agent, in June 1989, to arrange for the installation of the equipment. The Indian agent intimated the Research Centre that they were no longer the Indian agent of that firm as the foreign firm had changed their agency to another firm. The latter firm was approached by the Research Centre in August/November 1989 for the installation of the equipment. The equipment received in May 1989 had not been installed (October 1990). Further, the equipment, which was a high efficiency hypolizer and purchased for concentration of dilute protein solution, was to be used particularly for processing secreted macro molecules from cultures of filarial parasites and this objective could not be achieved.

Indian Council of Medical Research stated, in October 1990, that the Indian agent concerned as well as the principal firm were being reminded repeatedly for the installation of the equipment.

27. Construction of animal house and laboratory building

Indian Council of Medical Research (ICMR) sanctioned the construction of an animal house to replace the existing wooden structure in the Virus Research Centre (now National Institute of Virology) Pune, at Rs.4.56 lakhs in March 1976. The estimate was revised to Rs.40 lakhs after three months, to Rs.90.07 lakhs in 1979, to Rs.132.39 lakhs in August 1983 and to Rs.154.88 lakhs in September 1989. While the increase in the revised estimate to Rs.40 lakhs (from Rs.4.56 lakhs) within a few months of sanction was attributed to the work content being modified to six storeyed building, the subsequent increases were related to compliance with municipal bye-laws (bringing down the number of storeys to five) and to increase in cost index. Although the work order was issued in January 1980, the work was commenced only in 1982 and physical possession had not been handed over to the Institute (August 1990).

The Institute deposited with Central Public Works Department (CPWD) Rs.132.39 lakhs during 1974-84 and Rs.22.49 lakhs during 1988-90, completing the entire payment of Rs.154.88 lakhs by March 1990.

The civil works were completed by March 1987 but possession could not be taken over by the Institute due to excessive noise and vibration in the air-handling units etc. ICMR stated, in August 1990, that the animal house had been shifted to the new building in January 1990. But, there were many defects in the building still to be rectified because of which it could not be used properly as an animal house.

There was, thus, idling of funds to the extent of Rs.132.39 lakhs for over six years and escalation of cost to the extent of Rs.64.81 lakhs, with reference to estimate of September 1979, due to delay in completion of construction. Sterilizers costing Rs.5.43 lakhs purchased in September 1988 and chilling plant acquired in March 1985 for Rs.1.25 lakhs could not be put to use due to delay in completion of the animal house. Besides, non- availability of the facilities, even after 15 years of the original deposit made with CPWD in 1974-76, has been adversely affecting the research work.

Ministry of Science and Technology

Department of Scientific and Industrial Research

Council of Scientific and Industrial Research

28. Central Drug Research Institute, Lucknow

28.1 Introduction

Central Drug Research Institute (CDRI), Lucknow was established in 1951 to undertake research and development work in the field of drug and pharmaceuticals.

28.2 Scope of Audit

CDRI is audited under Section 20(1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. This review attempts to present an insight into the performance of CDRI as observed during a test-check of its various transactions pertaining to the period from 1985-86 to 1989-90.

28.3 Organisational set up

CDRI which is a multi-disciplinary research laboratory comprising eighteen research and development divisions, nine technical services divisions, five national facilities and three data stations, is headed by a Director. The Director is assisted by a Research Advisory Council and an Executive Council which were replaced, in 1988, by Research Council and Management Council respectively.

The functions of Research Council are to advise and recommend on the formulation of research programmes, conduct periodic reviews of the research activities, assess the progress and advise on fostering linkages between laboratory and academics. The Management Council is responsible for administering and managing the affairs and environs of the laboratory.

As on 1st April 1990, CDRI had 998 sanctioned posts of which 261 were scientists and 382 technical personnel.

28.4 Highlights

CDRI is mainly financed out of the grants received by CSIR from Department of Scientific and Industrial Research. CDRI received grants amounting to Rs.3400 lakhs in 1985-90 besides other receipts of Rs.2077.70 lakhs. The expenditure during the same period was Rs.5410.56 lakhs.

- *Fifty three projects including those in the thrust areas were continuing for more than five years.*

- *Detailed project report giving full description and objectives, period required for completion, expenditure to be incurred, physical and financial milestones was not prepared for each project at the commencement/sanction, consequently rendering appraisal or monitoring of the projects difficult.*

- *Most of the projects in thrust areas were going on for 10 to 25 years and these would continue as long as there was need for drug/vaccine developments.*

- *A number of projects were dropped for reasons like resignation of project leader, non-availability of materials etc. Cancer and viral infection projects were given low priority and subsequently dropped since no new leads could be generated.*

- *A number of projects delayed for various reasons led to redefining the target dates. Some of these projects were executed at a low key to serve as back up technology projects and could be accelerated or abandoned.*

- *National Information Centre for Drugs and Pharmaceuticals (NICDAP) was to earn about 10 per cent of the budgetted expenditure, but the income generated during 1985-90 fell far short of the percentage fixed.*

- *Since its establishment in 1951, CDRI had released 50 processes to the industry of which, nine are reported to be under commercial production, 25 out of 75 processes developed by CDRI could not be released to the industry because of one or more reasons such as the process could not be scaled up from laboratory scale, there was lack of interest/ sponsorship from the industry and improved process had become available elsewhere for commercialisation in the meanwhile.*

- *Out of the eight projects undertaken in the area of development of technology for drugs and*

intermediates, biologicals and fermentation products, only three projects have been developed, one of which was under field trial.

- *The amount received by CDRI towards royalty premia and consultancy charges during 1985-90 was a negligible component of the total receipts of CDRI as these were given low-priority as stated by CDRI.*

  Differences of large amounts relating to bank reconciliation and objection book advances had been pending adjustment/settlement during the last 18 years.

- *Shortcomings in observance of prescribed procedure leading to supply of damaged/defective equipment and non-installation/delay in installation of scientific equipment not only resulted in delay/hindrance to the research work but also caused blocking of funds and infructuous expenditure. It also caused avoidable payment of customs duty/demurrage and warehousing charges and over- stocking of materials. Physical verification of stores had been conducted upto 1986-87.*

28.5 Objectives

The objectives of CDRI are:

(a) development of new drugs and immunizing agents;

(b) development of contraceptive agents;

(c) basic bio-medical studies aimed at understanding of disease processes;

(d) systematic investigation of natural resources for discovery of drugs;

(e) development of appropriate technology for bulk drugs and intermediates, biologicals and fermentation chemicals;

(f) dissemination of information in the area of drug research, development and production; and

(g) consultancy and development of technical man power.

28.6 Budget and expenditure

The funds provided to CDRI consist essentially of grants given by Council of Scientific and Industrial Research which amounted to Rs.3400 lakhs during 1985-90. Besides, CDRI's other receipts, e.g., other grants, miscellaneous receipts, deposits and advances etc. amounted to Rs.2077.70 lakhs during the same period. Expenditure during this period was Rs.5410.56 lakhs. CDRI had a closing balance of Rs.130.79 lakhs as on 31st March 1990.

28.7 Research projects

28.7.1 Planning, execution and monitoring

Research activities of CDRI have been divided into various areas in view of their multi-disciplinary nature. Accordingly an area task force, comprising research staff drawn from different research and development divisions/disciplines, has become the nucleus of research planning deliberating inter-alia on the progress of work and identifying new programmes from amongst the programmes suggested by the respective task force conveners. The area progress report itself is discussed and finalised in project area meetings held half yearly/annually and thereafter submitted to Research Council. The overall review of the ongoing research and development work and identification of thrust areas is done by the Research Council and reflected in the annual report and annual plan documents.

The Research Council, by the very nature of its charter and composition, can undertake only an overall review of the ongoing programmes. It, therefore, becomes essential to do detailed monitoring of each project at a different level. The monitoring is to be done by the area co-ordinators based on the reports received from the concerned scientists implementing the projects. The recommendations of the area coordinators are to be submitted to the divisional heads for further appropriate action. The progress reports were in the form of statistical tables without indicating the precise bottle-necks and recommended action for their removal. It was noticed that these deficiencies in the progress reports and lack of follow-up action on them could be a reason for time over-run/extension of dates of completion for many projects.

One of the essential pre-requisites for monitoring is the availability of a detailed project report indicating the cost as well as time frame for its completion together with the major milestones. However, it was observed that detailed project report giving the full description and

objectives of the project, period required for completion, expenditure to be incurred, physical and financial mile-stones etc. was not prepared for each project consequently rendering any meaningful appraisal or monitoring of the project difficult.

It is conceded that it may not be possible to prepare cost estimates for all the projects but such cases should be a few. It was noticed that while areawise allocation of funds was available, projectwise accounts were not maintained as a result of which the expenditure incurred on the project vis-a-vis its approved cost and stated targets were not assessable at any point of time. This practice is not conducive to sound project manage ment besides hindering the monitoring process leading to the projects being continued either indefinitely or being granted several extenions.

The position in respect of various projects undertaken during 1985-90 is indicated below:

Year	Number of projects				
	Carried over from previous year	Under-taken during the year	Comple-ted	Aban-doned	Carried ove to next year
1985-86	81	15	4	2	90
1986-87	90	4	3	1	90
1987-88	90	11	-	2	99
1988-89	99	4	-	2	101
1989-90	101	4	4	3	98

The year-wise break-up during which the 98 projects had been continuing is given below :-

Years	No. of projects
20 and above	11
16 - 20	6
11 - 15	25
6 - 10	11
1 - 05	45
	98

Thus, 53 projects were going on for more than five years.

CSIR stated, in December 1989, that the thrust area projects would continue as long as the problem of disease exists. The time over run or extension of the date of completion were due to factors beyond their control. The projects were being monitored through monthly reports and half yearly and annual thrust area meetings etc. CSIR also mentioned in December 1989, that it was not possible to prepare project wise cost estimates.

But, even in the thrust area, projects were continued for long periods without resulting in development of new drugs/processes. Detailed project reports for the majority of the projects laying down various physical and financial mile-stones were not available rendering appraisal or effective monitoring difficult.

28.7.2 Thrust area projects

The thrust areas were identified keeping in view the priorities in the national health programme. Under each thrust area, project or approach is to be identified keeping in view the national and international knowledge and thrusts and the available expertise. The status of thrust area projects was as under:

	Thrust area	No. of projects	Year of commencement
(a)	Antifertility	1	1964
		2	1970
		2	1973
		3	1975
(b)	Parasitic Infections		
(i)	Filariasis and	1	1964
	other Helminth	1	1967
	infections	2	1974
(ii)	Malaria	1	1975
		1	1977
		1	1978
(iii)	Amoebiasis	1	1964
		1	1974
		1	1976
(iv)	Immunology and	2	1975
	microbial genetics	1	1977
(v)	Leishmaniasis	2	1984
		2	1985
(vi)	New drug standard-	1	1979
	isation and deli-	1	1985
	very system	1	1986
		1	1987

Thus, most of the projects in the thrust areas were going on for 10-25 years. In December 1989, CSIR stated that the above projects would continue as long as there was need for drug/vaccine development for relevant diseases. This reply was too general and did not indicate if any in-depth examination of the continuance need of these projects was ever attempted.

28.7.3 Termination of projects

A number of projects were dropped by CDRI for reasons like resignation of project leader, advice from the Director, non- availability of materials etc. A few illustrative cases are :

Sl No.	Name of project	Date of commencement	Date of termination	Expenditure incurred	Reasons for termination
1	Process for production of 5 Fluo-uracil	September 1980	December 1985	CDRI expressed inabilit to furnish the figure	Due to great difficulty in availability of an important intermediate, further work discontinued.
2.	Process for production of Diethyl u-lentyl melonate	March 1982	Marc 1986	-do-	Exploratory work done but since no interest was shown by the industry for sponsoring further work was discontinued
3.	Expression of cleaned parasite antigen in vaccine virus	January 1986	August 1986	-do-	Project leader resigned
4	Development of a process for the production of arnebin from Arnebia nobilis	June 1985	June 1987	-do-	On Director's advice

In December 1989, CSIR stated that such projects were dropped when lead against a particular disease could not be generated. Further, about 20 per cent of the projects in basic areas were scientist-oriented and, therefore, dropped when a scientist resigned.

CDRI undertook research and development (R&D) projects in cancer and viral infection during 1964-85 and 1974-85 respectively. An expenditure of around Rs.12 lakhs was incurred for cancer project during 1978-85. For the viral infection project, the expenditure during this period was around Rs. 29 lakhs. The expenditure incurred on these projects prior to 1978-79 was not known.

In December 1989, CSIR stated that cancer and viral infection projects were given low priority and subsequently dropped since no new leads for the development of potential anticancer and antiviral drugs could be generated.

28.7.4 Delay in execution of various projects

A number of projects were delayed for reasons like 'un-expected technical problems , non-availability of material and delay in obtaining permission from Drug Controller etc.,' resulting in cost over-run and non-availability of project know-how in time. For instance, two projects undertaken in 1964-74, nine projects undertaken in 1975-84 and three projects started in 1985-86 had been considerably delayed and were still continuing (November 1990) by extending the target date(s) of completion.

In December 1989, CSIR stated that one of the reasons for delay in execution of the projects was delayed permission given by Drug Controller which led to re-defining the target date. Further, some of the projects were executed at a low key to serve as back-up technology projects and could be accelerated or abandoned as the case may be.

28.7.5 National facility

A test check of two of the five national facilities viz.,Regional Sophisticated Instrumentation Centre

(RSIC) and National Information Centre for Drugs and Pharmaceuticals (NICDAP) showed the following :-

(i) A number of high value equipments were lying out of order at RSIC adversely affecting the efficacy of this national facility. Some examples, along with the reasons/latest position of each equipment as stated by CDRI in December 1990, are as under:-

Name of the equipment	Value of the equipment	Actual receipt	Commissioned	Not functioning from	Remarks
HPLC soda	Rs.2.50 lakhs	March 1981	June 1982	April 1985	At the instance of Audit, the equipment was put to use from October 1990 after getting it repaired.
Liquid helium plant	Rs.17.5 lakhs	September 1983	February 1984	September 1987	Inspite of regular attempts made by the Institute, the equipment could not be put to use (November 1990).
IR acculab I and 10	Rs.3.26 lakhs	November 1983	December 1983	June 1988	At the instance of Audit, the instrument was got repaired and put to use from September 1990

(ii) NICDAP was set up as a sponsored project fully funded by the Department of Scientific and Industrial Research for dis semination of information relating to drugs and pharmaceuticals to the industry and other users with the mandate to generate fund to the extent of 20 per cent of its budgetted expenditure each year during the Seventh Plan period. However, CSIR stated, in December 1989, that in one of the sectoral meetings of the na tional facilities held in 1984 it was decided that each national facility should try to earn about 10 per cent of the budgetted expenditure. A sum of Rs.85.58 lakhs had been spent on this facility upto March 1990 whereas income generated was Rs.4.21 lakhs i.e. 4.91 per cent of the total expenditure for the last five years . Thus the income generated by CDRI during 1985-86 to 1989-90 still fell far short of the reduced percentage.

28.8 Results of research and development

28.8.1 Process development

CDRI has developed processes for 75 drugs since 1951. Of these, only 50 processes could be released to the industry of which only nine namely 1-Ephedrine, Paracetamol, D-Propoxyphene HCL, Ibuprofen, D-2-Aminobutanol, 5,6-Dimethylbenzimidazole, Clofazimine, N-Methylpiperazine and Pyrithioxin were reported to be under commercial production. For the remaining 41 processes, there was no feed-back from the industry whether these were taken up for production or modification before utilisation. Non-release of 25 processes to the industry was because of one or more of the following reasons:

(a) the process could not be scaled-up from laboratory scale;

(b) there was lack of interest/sponsorship from the industry; and

(c) improved processes had become available else-where for commercialisation in the meanwhile.

CSIR stated, in December 1989, that the processes released to the industries but not commercialised had either been updated by industry and claimed to be their own or abandoned due to subsequent availability of better technology or uneconomical indigenous production. One of the processes developed about a decade ago for primaquin, an antimalarial drug, was now being taken up by the Indian Drugs and Pharmeceuticals Limited. Better interaction between CDRI and industry both at the time of initiation and during continuance of the research projects may be required.

CSIR further stated, in June 1990, that seven new R & D products indigenously developed have also been released for marketing, viz.,Gugulipid (under the trade name Gugulip), Isaptent (under the trade name Dilex-"C"), Centbucridine (under the trade name Bucricaine, INN), Centbutindole (under the trade name Biriperone,

INN), diagnostic kit for amoebiasis, diagnostic kit for filariasis, and Centimizone (antithyroid).

28.8.2 Development of technology for drugs and intermediates, biologicals and fermentation products

Of the eight projects undertaken in the area of development of technology for drugs and intermediates, biologicals and fermentation products, CDRI had indicated scheduled dates of completion in the case of six projects. It was noticed that of these, two projects were behind schedule by two years while in case of four projects, no further extension was granted but the projects were still going on.

In December 1989, CSIR mentioned, as achievement, development of only three projects one of which was under field trial. The reasons for delay and also continuance of the incomplete projects were not indicated.

28.8.3 Consultancy and transfer of know-how

CDRI provides technical consultancy to industry and funding agencies for specific projects and general production problems in return for consultancy charges. Besides, the CDRI also releases the processes developed for commercialisation to the industry and charges royalty/premia at a rate specified in the Memorandum of Understanding signed between them and the manufacturer.

The following amounts had been received by CDRI towards royalty/premia and consultancy charges during the last five years:

(Rupees in lakhs)

Year	Total Revenue	Of which	
		Royalty/ premia	Consultancy fees
1985-86	10.10	Nil	0.33
1986-87	14.54	0.03	0.24
1987-88	15.62	0.11	0.82
1988-89	12.13	0.94	0.73
1989-90	16.25	0.80	5.96

Receipts on account of royalty/premia as well as consultancy charges form a negligible component of the total receipt of CDRI. CSIR stated, in December 1989, that royalty, premia and consultancy charges were initially given low priority because the objective of CDRI was to develop tecnnolgoy for indigenous production of the vital drugs.

28.9. Accounts

28.9.1 Bank reconciliation

CDRI has a bank account with State Bank of India, CDRI Campus Lucknow. The bank reconciliation had been done upto September 1990 but the adjustment/settlement of discrepancies/differences for the last 18 years had not been carried out so far (November 1990).

A scrutiny of the bank reconciliation statement revealed the following:

(a) In 321 cases, while the bank statement showed Rs. 28.81 lakhs as having been realised by the bank directly on behalf of CDRI, such receipts had not been shown in CDRI's cash book. Out of these, 283 items involving Rs. 23.59 lakhs pertained to the period from May 1978 to March 1987 and 38 items amounting to Rs. 5.22 lakhs pertained to the period April 1987 to March 1990. No action had been taken to account for old items in the cash book after obtaining the necessary details either from the bank, remitter or other sources.

(b) In 20 cases pertaining to the period from May 1979 to March 1990, although receipts totalling Rs. 0.36 lakh had been accounted for in cash book, these did not find a place in the bank's pass book/statement.

(c) In 856 cases, from February 1972 to March 1990, although amounts totalling Rs. 44.21 lakhs had been debited in bank pass book/statements, these debits had not been accounted for in the cash book. Of these, 679 cases involving Rs. 39.36 lakhs pertained to the period from February 1972 to March 1987 and 177 cases involving Rs.4.85 lakhs pertained to the period from April 1987 to March 1990. Unless outstanding items are reconciled, the possibility of misappropriation cannot be ruled out.

(d) There were differences/discrepancies of Rs.1.28 lakhs consisting of 13 items pertaining to the period from June 1981 to January 1986. CSIR informed, in November 1990, that the difference had been brought down to Rs.0.01 lakh.

28.9.2 Outstanding advances

(a) CDRI has been making advance payments to officials, private parties, Government organisations etc., on account of travelling allowance, purchase and supply of materials/equipment etc. It was noticed that an amount of Rs.64.70 lakhs relating to the period upto March 1989 was outstanding (August 1989) for adjustment. Of these, Rs.22.55 lakhs were outstanding with private parties from 1976-77 onwards while an amount of Rs. 8.74 lakhs towards travelling allowance/leave travel concession and local purchases was pending with officials of CDRI since 1980-81.

(b) CDRI had been importing laboratory and other equipment by opening letters of credit through its bankers and keeping the letter of credit's amount as margin money. A sum of Rs. 83.02 lakhs pertaining to the period from 1976-77 onwards was awaiting adjustment (July 1989).

CSIR stated, in December 1989, that a task force had been created to take necessary steps in the matter.

28.10 Stores

28.10.1 Defective/incomplete documentation

(i) CDRI placed an order on a foreign firm in July 1986 for purchase of high performance liquid chromotograph equipment and paid Rs.6 lakhs through an irrevocable letter of credit opened in October 1986 with the State Bank of India. The equipment despatched in eight packages arrived in Bombay in May 1987 and CDRI received only seven packages in February 1988. One package containing the main equipment was not received which was reported to the clearing agents. The supplier intimated in February 1989 that the consignment had arrived in India on 30th May 1987 but as the loss was not apparent till 11th January 1988, it was outside the scope of the insurers. However, they advised that negotiations with the under-writers for partial recovery was possible provided CDRI could furnish information regarding date of delivery, copy of delivery document etc. CDRI was not able to furnish the information/documents till date (August 1989). CSIR stated, in December 1989, that the insurance claim was being pursued. CDRI later informed, in December 1990, that the equipment has since arrived on 6th December 1990 and action for installation would be taken.

(ii) CDRI placed a purchase order on a foreign firm for supply of Varian gas chromatograph with accessories and paid Rs.3.70 lakhs through a letter of credit opened with the State Bank of India in May 1986.

The equipment arrived at New Delhi airport in July 1986. 'Not Manufactured in India' (NMI) certificate necessary for release of the equipment could be obtained by CDRI on 6th October 1988 - after more than two years. The CDRI paid a sum of Rs.1.20 lakhs as advance to the clearing agent towards payment for storage of the equipment at the airport godowns.

Even after obtaining the NMI certificate, the equipment could not be got released by CDRI as their clearing agents reported (January 1989) that the consignment was not traceable. CDRI has not yet been able to obtain the release of the equipment (August 1989). CDRI is also not aware of the total amount of godown rent payable.

CDRI stated, in December 1990, that the consignment has been traced and received in January 1990 and action to instal was being taken.

(iii) CDRI had placed purchase order on a foreign firm for import of Vista basic dial channel G.C. with interactive key board and estabished a letter of credit for Rs.3.40 lakhs in February 1987.

The consignment of three packages arrived in India on 22nd March 1987. The payment was released by the bank to the suppliers in April 1987. The clearing agent had requested CDRI in March 1987 to forward documents required to be submitted to custom authorities which were furnished to them only at the end of December 1988.

As there were certain damages / discrepancies in the consignment, it was surveyed in February 1989 and cleared. CDRI lodged an insurance claim in April 1989 which remained to be settled (December 1990)

An amount of Rs.3.40 lakhs has thus remained blocked for two years besides avoidable expenditure of Rs. 0.71 lakh towards warehousing charges due to belated clearence of the equipment. CSIR stated, in December 1990, that the equipment had been installed in June 1989.

28.10.2 Non-installation leading to idling of investment

(i) CDRI placed a purchase order in October 1986 on a foreign firm for supply of "Vickers M-85-A scanning microdensitometer". The equipment which was supplied by the firm in January 1987 was received by CDRI in two packages in July 1987 and April 1988.

During installation, CDRI noticed that certain vital parts of the equipment were damaged and requested the supplier, in July 1988, for replacement of the defective items. The supplier informed, in February 1989, that the parts could not be replaced free of charge as their warranty period had already expired. Further, they also demanded additional payment on the ground that the parts were not in stock and had to be got manufactured specially for the equipment.

The equipment worth Rs.7.22 lakhs had been lying uninstalled at the CDRI since July 1987 and replacement of the missing parts was uncertain.

CDRI stated, in December 1990 that the manufacturer was being persuaded to get the defective parts replaced.

(ii) CDRI placed an indent in April 1986, on the Indian agent of a foreign firm for supply of one electrolyte automat system 2000 type 0045 on single tender basis. The equipment package sent by air, in December 1986, from Hamburg (Germany) to Bombay was received at CDRI in July 1987 where some parts were found short/damaged, which were reported to the foreign supplier (July 1987). A claim for Rs.0.37 lakh was subsequently (July 1988) preferred on the supplier. There has not been any response from the supplier and consequently the equipment has been lying unused in damged condition at the CDRI since July 1987.

CDRI stated, in December 1990, that the supplier was being persuaded to replace the parts.

(iii) CDRI had decided to purchase one Sci/ ERA production roller system from a foreign firm for Interferon project for which Rs.2.13 lakhs was paid through a letter of credit opened in March 1987 with State Bank of India. The firm had supplied the equipment in May 1987. On arrival at Bombay airport, the equipment was inspected and certain items were found short and reported to the supplier in November 1988.

There had not been any response from the supplier so far (August 1989) resulting in non-installation of the equipment.

CDRI stated, in December 1990, that they were left with no alternative except to await replacement.

(iv) A test check also revealed that different instruments were lying un-installed leading not only to blocking of funds but also affecting research. Some are mentioned below:

Name of the division	Name of the equipment	Value of the equipment	Year of purchase	Year of actual receipt
		(Rupees in lakhs)		
Toxicology division	Servall DTD-65 centrifuge oil turbine	1.50	1982	1982
-do-	Model 7121 single compressor ultra low temperature crystor freezer 100 degree celcius configura-capacity 364 liters	1.29	1986	1988
Regional Sophisticated Instrumentation Centre	Spectrofluro-meter	3.40		1985

CDRI stated, in December 1990, that the equipment (Model 7121 single compressor ultra low temperature) has been installed in August 1989; action was being taken to set right the defects in respect of the other two equipments.

(v) CDRI placed a purchase order, in Februrary 1988, for import of Corona analyser with a service box at a cost of Rs.3.73 lakhs. Out of two packages freighted, one was received by it in May 1988 The second

package, which was missing during transit from Bombay to Lucknow, was received in August 1988.

During its installation in October 1988 certain parts fitted in the equipment were found defective and were replaced out of the spares received alongwith the equipment. The equipment which was installed during October 1988, went out of order in November 1988.

CDRI stated, in December 1990, that the entire instrument has been got replaced with a new one in May 1990 and installation was under process.

28.10.3 Physical verification

(a) Physical verification of all stores was not being done annually though required under the General Financial Rules. Physical verification of stores held by various divisions of CDRI was conducted upto 1986-87 by a committee specially constituted for the purpose. From the physical verification report given by the committee it was noticed that no action had been taken with regard to the shortages/discrepancies (August 1989).

CDRI stated, in December 1989, that the team had started the work and efforts were being made to settle the discrepancies.

It was also noticed in Audit that the figures under various headings of assets shown in the balance sheet were being taken from the records of the Accounts branch and not from the asset registers maintained by the concerned divisions/sections. The figures included in the balance sheet were also not reconciled with the progressive totals of the asset registers.

(b) It was noticed that 641 items with a book value of Rs. 12.98 lakhs declared unserviceable through survey inspections conducted during the years 1985, 1986, 1987 and 1989 were yet (August 1989) to be disposed of. These were occupying valuable storage space despite Government of India's decision to minimise the time lag between the declaration and actual disposal of stores to ensure that such stores fetch good return.

CSIR stated, in December 1989, that action was being taken to dispose of the unserviceable items.

29. Wasteful expenditure on a machine

Central Mechanical Engineering Research Institute, Durgapur initiated, in March 1986, a project titled 'Development of multiple feeder multi cum track circular knitting machine' for developing a comparable indigenous proto-type and design for manufacture by Indian industry. Under the project, a circular knitting machine costing Rs.8.49 lakhs and with versatile knitting capabilities was imported. The machine was received by the Institute in June 1987. As per the terms of the purchase order, the installation of the machine was to be arranged free of cost by the Indian agent of the foreign firm who was paid (February 1988) agency commission of Rs.0.42 lakh. But the machine was installed (January 1988) by the scientists and staff of the Institute reportedly at no extra expenditure for installation. The foreign firm agreed to impart training to one person for two weeks in the United Kingdom and to bear all costs in that respect but no scientist was sent abroad for training. The foreign firm communicated (September 1988) requirement of some safety device to avoid damage both to the machine and to its operator. The safety device was to be supplied by the firm free of cost. But the same was not obtained by the Institute.

The project for which the machine was procured was, however, dropped in December 1988 as the detailed survey indicated very poor market demand and acceptability of the product.

The entire expenditure of Rs.8.91 lakhs incurred by the Institute became wasteful as the intended benefit was not secured.

The matter was referred to Council of Scientific and Industrial Research in August 1990; reply has not been received (March 1991).

30. Unproductive expenditure on a project

For developing software packages to be used by industries, a long-term project entitled "computer aided design" was taken up by Central Mechanical Engineering Research Institute, Durgapur. After spending about Rs.10.00 lakhs, the project was foreclosed, for lack of interest of the user industry, rendering the entire expenditure unproductive.

The project was approved in January 1982 at an estimated cost of Rs.7.00 lakhs and was to commence in the same month. Equipment, including the computer system, purchased under the project in early 1982, at a cost of Rs.8.00 lakhs, could be made functional only in January 1984 as some defects noticed during its installation had to be rectified. Initially, three scientists worked from January 1984 to June 1986 devoting 60 per cent

of their time on this project and the expenditure on manpower was to the tune of Rs.1.35 lakhs. Besides, the Institute purchased two software packages for Rs.0.53 lakh.

The Research Advisory Council of the Institute, in its meeting held in 1984, suggested that the Institute should identify the specific areas in which there were possible buyers. A survey for this purpose was carried out in April 1987 and its results submitted for consideration of the Research Council in its meeting held in July 1988. The Research Council approved the recommendation of the Institute for dropping the project with retrospective effect (from July 1987) 'as no user industry showed interest to buy or use the software developed'. Had the essential survey to assess the market potentiality of the proposed software packages been conducted before undertaking the project, the expenditure of Rs.9.88 lakhs could have been avoided.

Council of Scientific and Industrial Research stated, in February 1991, that a seperate division called "Computer Aided Design Analysis" had been formed by the Institute to devote completely to this aspect of research and development.

31. Unfruitful expenditure on a research project

Central Mechanical Engineering Research Institute,Durgapur undertook an in-house project on'design and development on microhydraulic turbine plant'for power production as approved by the Research Advisory Council in September 1983. The project was to be completed in October 1985 (extended upto June 1987) at an estimated cost of Rs.25 lakhs. An expenditure of Rs.11.42 lakhs was incurred on the project upto December 1985. The project was dropped in December 1988 as a detailed survey indicated very poor market demand and acceptability of this product.

In December 1985, the Institute had developed a prototype known as 50 kw experimental turbine (model) of axial flow type for tapping low head power abundantly available in canals and river systems. This prototype was to be evaluated after testing and design modifications suggested as a result of testing and incorporated in the final prototype which could be developed for installation. For this purpose, the Institute decided to enter into an agreement with Alternate Hydro Energy Centre (AHEC), University of Roorkee as they (the Institute) did not have the necessary infrastructure. Despite this, the prototype which had long been ready for testing could not be tested. The project had to be kept in abeyance at the instance of the project leader from July 1987 till such time the testing of the prototype took place either at AHEC or at any other suitable place. Ultimately, it was decided, in December 1988, to close the project as the detailed survey indicated very poor market demand and acceptability for this product. Had this survey been carried out before taking up the project, the unfruitful expenditure could have been avoided. It may also be mentioned that as early as in April 1986 it had been proposed to drop the project with effect from June 1986 for lack of manpower and other facilities and because the project leader was employed elsewhere.

The project which was initially taken up as in-house project from November 1983 was closed in December 1988 rendering the entire expenditure of Rs.11.42 lakhs unfruitful.

The Institute stated, in June 1990, that the project was a design exercise in a new field. Experience gained through it would be utilised in due course.

The matter was referred to Council of Scientific and Industrial Research in August 1990; reply has not been received (March 1991).

32. Non-utilisation of spectrometer

National Institute of Oceanography, Goa placed an order, in June 1983, for nuclear magnetic resource spectrometer, on a foreign firm, at a cost of Rs.13.71 lakhs, for use in its Chemistry Division. The equipment arrived at Bombay port in May 1984 and at the Institute in September 1984. A sum of Rs.0.58 lakh was paid to the foreign firm towards sea freight, insurance and packing charges. The consignment was received in damaged condition (cases stained by water outwardly). The cases, therefore, could be opened only in the presence of an insurance representative and the engineer of the foreign firm . Five items were found to be beyond repair. In January 1986 the Institute lodged insurance claim of Rs.1.46 lakhs for damage in transit with the underwriters. The underwriters rejected the claim on the ground that the Institute had not sent the notice to them within 15 months.

The equipment was installed and commissioned in June 1986 and went out of order from August 1988. The service engineers of the foreign firm attended to the repairs only in October 1988. Even after these repairs, the equipment could not be put to working condition due to further snags (May 1990). The Institute was yet to pay the agency commission of Rs.0.67 lakh to the Indian agent. In the absence of the equipment, the analysis work was got done by the Institute at the Indian Institute of Technology, Bombay, Tata Institute of Fundamental Research, Bombay and Central Drug Research Institute, Lucknow since August 1988.

The Institute had not over-ruled (May 1990) the cause for defect as weathering effect on the electronic

components occurred during the initial transit period. Effective steps ought to have been taken to guard against the weathering effect but obviously it was not done.

Thus, the equipment costing Rs.13.71 lakhs was put to minimal use for over two years and the equipment was not in use since August 1988. The claim of transit insurance of Rs.1.46 lakhs was also treated as time-barred by the underwriters. However, the Institute stated that the claim was still pending (May 1990).

The matter was referred to Council of Scientific and Industrial Research in June 1990; reply has not been received (March 1991).

33. Extra expenditure on construction of science centre (guest house) at Goa

National Insitute of Oceanography, Goa floated, in June 1985, a composite tender enquriy for construction of science centre (guest house) including water supply, sanitary and internal electrical installations. However, while awarding the work after scrutiny of the tender, the electrification work was deleted (September 1985) on the ground that the rates quoted for electrical work in the tender were disproportionate and hence needed reconsideration. The construction of science centre (guest house) including water supply and sanitary installation was awarded to firm 'A' in December 1985. Separate tenders for internal electrification were called for in March 1986 and the work was awarded in June 1986 to firm 'B' for Rs.1.46 lakhs.

As per the agreement with firm 'A', the civil work was required to be completed within 15 months from 10th March 1986, i.e., by 9th June 1987. As per the agreement of August 1986 with firm 'B', the electrical work was required to be completed by September 1987. The superstructure work upto slab level and staircase landing was completed by firm 'A' in March 1987 and thereafter the work was stopped due to non-commencement of work by firm 'B'. The Council of Scientific and Industrial Research (CSIR) issued a notice to firm 'B', in May 1987, asking it to resume the work within a week failing which the contract would be terminated. However, the contract was not terminated even after the lapse of one week on the plea that the work would be got done through the active partner of firm 'B'. It was decided in August 1987 by CSIR and firm 'B' that the electrical work would be got completed after transferring the work to the active partner of firm 'B' as successor firm on the same terms and conditions and rates as per the agreement with firm 'B'. Firm 'B' was paid, in October 1986, secured advance (75 per cent) of Rs.0.56 lakh for electrical materials brought to site (cost Rs.0.78 lakh). The Institute stated, in February 1990, that materials were under the custody of the Institute. The work was not taken up by firm 'B' but in December 1987 firm 'B' requested for an increase in the rates on the plea that civil work was started after one year of issue of acceptance letter in June 1986. As the active partner did not commence the work, the contract was ultimately terminated by CSIR in February 1988, i.e., after a lapse of eight months from the issue of first notice but without any risk and cost to the contractor (February 1988). The security deposit of Rs.0.02 lakh of firm 'B' was forfeited.

CSIR granted extension to firm 'A' to complete the work by December 1987 with the expectation that the electrical work would be completed by November 1987. But, owing to the non-commencement of electrical work by firm 'B', the work was stopped by firm 'A'from March 1987. It was decided in October 1988 by CSIR, Institute and firm 'A' that further work would come to an end on 27th October 1988. However, no formal letter terminating the agreement had been issued by CSIR (February 1990).

The Institute awarded the remaining civil and electrical works to firm 'C' at a total cost of Rs.34.86 lakhs in July 1989 after call of composite tenders in April 1989. The work was scheduled to be completed in 15 months.

The fact that the civil and electrical works were awarded together subsequently would go to show that the decision to delete the work of internal electrical installation from the tender of firm 'A' which had quoted their rates for the composite work including electrical work was not correct. This has resulted in an estimated extra expenditure of Rs.9.40 lakhs on the basis of the quoted rates of firm 'C' besides delay in the construction of the science centre by about three years.

The matter was referred to CSIR in July 1990; reply has not been received (March 1991).

34. Avoidable expenditure on payment of electricity charges

Regional Research Laboratory, Bhubaneswar was getting its electricity supply from Orissa State Electricity Board (OSEB) in bulk for the laboratory including the staff quarters. For bulk supply of electricity, the laboratory had been making payment to the OSEB at 60 paise per unit upto 1987-88 and at 65 paise per unit thereafter. However, the recovery of charges from the staff was being made by the laboratory at 40 paise per unit during the last five years from 1985-86 to 1989-90 on the basis of consumption of electricity recorded in the meters installed by the laboratory in each staff quarter resulting in short recovery of Rs.2.21 lakhs .

There was no separate meter in the substation, from which power was supplied to the Laboratory to record actual consumpion of electricity in staff quarters till June 1988. The requisite separate meter in the sub-station was installed by the OSEB in June 1988 and separate electricity bills were being issued by them for the Laboratory and the staff quarters.

The Laboratory decided in June 1990 to increase the electrcity tariff of the staff quarters to 65 paise per unit with effect from June 1990.

The matter was referred to CSIR in July 1990; reply has not been received (March 1991).

35. Delay in opening letter of credit

National Metallurgical Laboratory (NML), Jamshedpur, issued a tender enquiry in September 1987 for supply of a 40 kg vaccum induction melting and casting furnace for its Melting Service Division. The tenders were opened on 20th October 1987.

Firm "A" quoted CIF price of Rs. 50.90 lakhs in foreign exchange including spares and accessories. The offer was valid upto 20th January 1988. Firm "B" quoted CIF price of Rs.48.48 lakhs in foreign exchange including 1.5 per cent agency commission and spares and accessories. The offer was valid upto 31st December 1987. Firm "C" quoted CIF price of Rs.47.74 lakhs in foreign exchange including five per cent agency commission and accessories. The offer was valid upto 18th January 1988.

Unable to finalise and conclude purchase order within the validity period, NML requested all the three firms, in December 1987, to extend the validity of their offers for three months and asked them for negotiation/discussion on 22nd December 1987. Accordingly, a meeting was held on the scheduled date. Thereafter, firms "B" and "C" extended the validity of their offer upto 31st March 1988 and 28th February 1988 respectively. No extension of validity of offer was submitted by firm "A".

NML placed a purchase order on firm "C" on 29th February 1988 on CIF Calcutta port basis. The last date of shipment as per stipulation of purchase order was 5th November 1988. It was also stipulated therein that the relevant letter of credit (LC) would expire on 20th November 1988. Despite specific request by firm "C" (March 1988), the requisite LC was not opened by NML even within the extended period. The overseas firm "C", through their Indian agent, requested NML to expedite opening of LC to facilitate them to undertake manufacturing of the furnace and to despatch it within the scheduled delivery period. NML approached the State Bank of India, Jamshedpur (August 1988) for opening the LC for £1,92,600 after excluding £10,200 on account of agency commission and £1200 being the insurance charges from CIF value of £204000. The LC was established on 5th September 1988, but owing to a number of mistakes the same could not be acted upon. The Indian agent of firm "C" informed NML that their principal firm desired NML to extend the validity of the LC immediately to enable them to book the shipping space. Thereafter, NML asked the bank (November 1988) for necessary amendment of the LC of September 1988. The dates were subsequently extended by NML upto 15th February 1989. By then the exchage rate had increased. Consequently NML had to incur an expenditure of Rs. 54.00 lakhs for the purchase of the furnace in place of the original price of Rs. 48 lakhs. This made NML suffer a loss of Rs.6.00 lakhs for their belated action in opening LC in the proper form.

NML observed, in July 1990, that the "purchase of furnace was made with excellent planning and foresighted judgement. Unfortunately the rules and procedure and exigencies of situations prevented them to do better".

36. Supply of electricity to the staff quarters

Central Fuel Research Institute, Dhanbad has its own campus with internal power supply system. The Institute received bulk supply of electricity from the Bihar State Electricity Board (BSEB) and distributed the same to office building, laboratories and staff quarters. Meter was installed in each quarter for recording unit of electric power consumed. For the total consumption of electricity the Institute paid the monthly bills preferred by BSEB as per prevailing industrial rates varying from Rs.0.96 per unit to Rs.1.26 per unit from April 1987. But, the Institute has been recovering electricity charges from occupants of the staff quarters at the flat rate of Re. 0.50 per unit from December 1984. The Institute has, thus, been incurring loss by not having a separate line for the staff quarters and recovering energy charges for supply of electricity to occupants of the staff quarters at a rate lower than what was payable by the Institute to BSEB. The loss worked out during the period from April 1987 to March 1990 on this account amounted to Rs.7.32 lakhs.

Council of Scientific and Industrial Research stated, in November 1990, that it would not be in the fitness of things to recover the loss from the employees who would be hard hit if it was decided to enhance the per unit consumption rate. It was also indicated that BSEB had been requested to provide separate individual connections to the occupants of staff quarters.

37. Non-Installation of an imported equipment

The Institute of Microbial Technology, Chandigarh decided, in February 1985, to install an imported equipment with accessories at Chandigarh, at a total cost of Rs.4.72 lakhs, to provide large amount of water of required quantity/quality for all the laboratories. The equipment was airlifted to India in July 1985 paying an air freight of Rs.1.00 lakh and taken over in August 1985. It took over five years for the equipment to be installed in the Institute resulting in blocking of funds to the tune of Rs.3.91 lakhs.

The Institute stated, in July 1990, that the equipment could not be installed due to non-completion of its permanent building in Chandigarh. As a result of non-installation of the equipment, the purpose, i.e., supply of large amount of quality water to the laboratories, was being met with the help of small distillation units running round the clock.

The Council of Scientific and Industrial Research informed, in November 1990, that the equipment was installed in September 1990 and was working satisfactorily.

Department of Science and Technology

Regional Sophisticated Instrumentation Centre, Shillong

38. Non-installation of sophisticated equipment

(a) The Regional Sophisticated Instrumentation Centre (Centre) at the North-Eastern Hill University, Shillong which is receiving grants from the Ministry had purchased in March 1987 one fourier transform interferonetric spectrophotometer with full accessories from a foreign firm, for US$1.52 lakhs (Rs.19.97 lakhs). In addition, technical service charges and guarantee fee for US $ 0.20 lakh (Rs.2.66 lakhs) were to be paid to the Indian agent.

The instrument which reached Calcutta airport in October 1987 was cleared in December 1987 after payment of terminal charges of Rs.0.10 lakh. It was got surveyed by a licenced surveyor in April 1988 and transported by road from Calcutta to Shillong after insuring it at a premium of Rs.0.10 lakh. The instrument was taken delivery in May 1988 from the road carriers in a badly damaged condition for which no compensation could be recovered as the instrument was booked at "owner's risk".

The Indian agent failed to assess the extent of damage caused to the instrument and the Centre approached the foreign firm, in August 1988 for sending an engineer for this purpose. In December 1988, the extent of damage was surveyed and assessed jointly by the representatives of the foreign firm, the surveyors and personnel of the Centre. Components worth US$ 1.06 lakhs were found to be damaged and needing repairs at the factory. Some other parts also needed replacement. The foreign firm in December 1988 quoted US$ 1.10 lakhs for supplying new parts; or US$ 1.33 lakhs for repair of existing parts and supply of assemblies which could not be repaired at site.

No decision had been taken by the Centre till May 1990 on the alternatives offered by the foreign firm for installation of the instrument. A claim for US$ 1.24 lakhs has been lodged with the insurers for the damage to the equipment.

Ministry stated, in May 1990, that the equipment had been received in damaged condition and could not be made available for research programmes and that the matter was being pursued with insurance agents with whom the equipment was fully and comprehensively insured to get compensation. It was stated later, in January 1991, that the insurance company had paid the claim of Rs 13 lakhs for the damaged spectrometer and that the Instrumentation Centre had already taken a decision for a new system based on a quotation given by the principal in August 1988.

(b) In another case, the Centre had imported one mass spectrometer for Rs.29 lakhs for imparting teaching and improving research facilities at Ph.D. and post graduate levels, from a foreign firm through their Indian agent.

The instrument arrived at Calcutta airport in July 1983 and was transported to the Centre in April 1984 after payment of terminal charges of Rs.0.21 lakh and freight charges of Rs.0.25 lakh. In September 1984, the Centre reported to the foreign firm that the instrument was installed and functioning satisfactorily.

Subsequently, in February 1986, the Centre reported to a scientist who wanted to work on the instrument, that it was not fully installed and they were awaiting the arrival of the firm's engineer to complete the installation. The instrument has remained out of order since 1984 owing to various faults developed from time to time in its main components which could not be rectified by the service engineers of the Indian agent who finally reported in April 1986 that there was substantial corrosion in the main frame and electronic cabinet of the instrument. In May 1986, the Indian agent pointed out that a representative of their principals had reported, after visiting the Centre, that infrastructure required for housing the equipment had not been provided resulting in improper placement leading to

rusting and corrosion with consequential impairment of its functioning. The foreign firm laid the blame for mishandling of the equipment on the Centre.

In March 1987, the instrument was put into operation after some repairs but could remain in operation only for six hours. It could not be brought back to working condition thereafter.

The Centre did not report incomplete installation to the foreign firm in time. A report of satisfactory installation and operation was made instead and full payment released.

The Ministry stated in May 1990, that the sub-systems were found to be not functioning at the time of the receipt itself and initial attempts to get set the machine did not succeed. It was further stated that when the engineer finally visited in March 1987, four sub-systems were not found functioning and it was proposed in February 1990 to finally install it subsequently postponed to May 1990.

Thus, expenditure of Rs.49.53 lakhs remained unproductive with adverse effect on the very purpose of imparting teaching and improving research facilities for which these had been imported.

The Ministry stated, in January 1991, that the equipment had been installed in December 1990 and was functioning.

Bose Institute, Calcutta

39. Expenditure on an incomplete project

Department of Science and Technology conveyed sanction (1978) to Bose Institute, Calcutta, to undertake a project "Ultrasound physics and its extension to ultrasound biology" for study of single crystal solids and biological tissues by ultrasound method. The project which commenced in February 1978 remained incomplete and was terminated in May 1983 after incurring an expenditure of Rs. 11.11 lakhs owing to the retirement of the investigator concerned in March 1983.

A project completion report had been sent to the Department in July 1984 proposing therein that the project work would be complemented by a second project to be submitted to the Department. The second project was not approved. Against the allocation of Rs.13.21 lakhs a sum of Rs.10.74 lakhs had been spent on procurement of equipment, Rs.0.19 lakh on salaries and Rs.0.18 lakh on consumables etc., till the termination of the project. No evaluation was made to ascertain as to how far the objectives of the project had been fulfilled.

Out of the various equipment purchased for the project, some were being partially utilised for other purposes. The Institute stated, in May 1990, that it would be futile to attempt utilising a highly sophisticated and valuable instrument as the personnel of the Institute do not normally work in that area. Audit noticed that some equipment had been in defective condition from the initial stage. The Emisonic ultrasound scanner valued at Rs.6.88 lakhs gave trouble from the very beginning even after repeated repairs.

While accepting the facts the Department stated, in January 1991, that the abandonment of the project was owing to the retirement of the Investigator.

Indian Institute of Astrophyscis, Bangalore

40. Unrealistic assessment of power requirement

Indian Institute of Astrophysics, Bangalore entered into an agreement with the Tamil Nadu Electricity Board (TNEB), in March 1982, for supply of a maximum load of 400 Kilo Volt Amperes (KVA) high tension electricity for its observatory at Kavalur in Tamil Nadu. The Institute was required to pay minimum charges every month as prescribed in the tariff. From September 1985, revised procedure for maximum demand billing was brought into force according to which charges were to be paid on the maximum demand during a month or 75 per cent of the contracted demand, i.e., 300 KVA, whichever was higher.

A review of the power consumption during September 1985 to March 1990 revealed that the maximum recorded demand through out the period was less than 45 per cent of the contracted demand, ranging from 102.5 KVA to 172 KVA. The Institute was paying the minimum demand charges on 300 KVA resulting in an avoidable extra payment of Rs.4.71 lakhs.

The Department stated, in October 1990, that in order to take up new projects projected in the Seventh Plan, including installation of few new telescopes of medium size, and taking into account the extra power required, the maximum demand was retained and this could not be reduced until changes in the programmes had been enforced. The Department further stated that in view of the budgetary constraints and based on modified programmes the position was reviewed and the maximum demand reduced to 225 KVA from June 1990. Had the Institute reviewed the position and made a realistic assessment of the power requirement initially, the payment of Rs.4.71 lakhs could have been avoided.

Indian Association for the Cultivation of Science, Calcutta

41. Purchase of residential flats and car parking space

Indian Association for the Cultivation of Science, Calcutta, a grantee institution under the Department of Science and Technology purchased sixteen flats and three car parking space at the Basundhara Apartment Complex, Calcutta from a private concern at a cost of Rs.26.54 lakhs, paid in instalments from November 1984 to March 1986. The purpose was to meet the acute housing problem of scientists/officers. At the time of purchase and even thereafter the marketable title to the said property was not received/settled (June 1990). Of the 16 flats, 14 flats valued Rs. 22.91 lakhs were sold to equal number of academic staff who were given house building advances and two flats and three car parking space were retained by the Association. It was contemplated initially to utilise these two flats for residential purpose for the officers of the Association but subsequently the proposal for using the same for guest house was mooted which due to objection raised by the residents of other flats was dropped. The value of these two flats and the car parking space was Rs.3.63 lakhs of which the value of car parking space was Rs.0.47 lakh. In December 1986, it was decided to sell these vacant flats to the scientists/ officers on cash basis but none agreed to such purchase on cash payment. In February 1988, it was decided to sell the flats on the same terms and conditions as in the case of the flats sold earlier but this also did not materialise. In July 1989, it was again decided to dispose of the flats immediately on out-right sale basis in view of the financial crisis in the Association but this also did not materialise (June 1990) owing to non-receipt of marketable title to the flats. Out of the three car parking space, one was being utilised by an allottee of the Association at the rate of Rs.150 per month as licence fee from July 1989. The Association had incurred Rs.0.83 lakh upto June 1990 for hiring private accommodation to provide facilities for boarding and lodging to their guests besides, maintenance and other charges of Rs.0.18 lakh on the vacant flats upto June 1990.

Thus, the delay in obtaining marketable title to the property had led to non-disposal of two flats and three car parking space (one car parking space upto June 1989) costing Rs.3.63 lakhs for 51 months (upto June 1990) besides incurring an expenditure of Rs.0.18 lakh on their maintenance.

The Ministry stated, in May 1990, that Housing Co-operative Society has since been formed and the issue of marketable title from the promoter would be settled as soon as possible.

Department of Atomic Energy

Variable Energy Cyclotron Centre, Calcutta

42. Avoidable payments 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. The Variable Energy Cyclotron Centre, Calcutta before importing equipment, spares etc., including free warranty replacement from abroad for various research activities, did not intimate the Directorate of Purchase and Stores, the central purchase organisation of the Department, regarding such shipments before hand to enable them to apply for "NMI and CDE" certificates in time. Consequently, the payment of customs duty became inevitable. The Centre had to incur an avoidable expenditure of Rs.11.23 lakhs towards payment of customs duty during 1984-87 and 1989-90.

The Department stated, in September 1990, that almost all these cases were of the voluntary replacements. This was not tenable as exemption certificates could have been obtained in these cases also but the Department had not taken timely action to get the requisite certificates.

CHAPTER IV

Departmentally Managed Government Undertakings

43. Position of Proforma Accounts

Under the Department of Atomic Energy there were two departmentally managed Government undertakings of commercial/ quasi commercial nature namely Heavy Water Pool Management and Nuclear Fuel Complex. The financial results of these undertakings are ascertained annually by preparing proforma accounts outside the general accounts of Government. The proforma accounts in respect of Heavy Water Pool Management for the years 1982-83 onwards have not been received (March 1991). The accounts of Nuclear Fuel Complex for the year 1987-88 and 1988-89 have also not been received (March 1991). These accounts have not been forthcoming to Audit inspite of repeated reminders to the Depart ment.

From the accounts of Heavy Water Pool Management and Nuclear Fuel Complex for the years upto which they were available, the following position emerged:

Name of the undertaking	Period of accounts	Government capital	Block assets (Net)	Depreciation to date	Profit	Interest on Government capital	Total return	Percentage of total return to mean capital
				(In lakhs of rupees)				
Heavy Water Pool Management, Bombay	1981-82	9829.11	1.10	0.84	148.10	550.78	698.88	7.99
Nuclear Fuel Complex, Hyderabad	1985-86	2052.67	1828.58	224.09	483.08	546.64	1029.72	7.69
	1986-87	2212.91	1890.98	321.93	780.96	798.63	1579.59	9.84

With the formation of Nuclear Power Corporation of India Limited (NPC) on 17th September 1987, the proforma accounts in respect of Tarapur Atomic Power Station, Madras Atomic Power Station and Rajasthan Atomic Power Station II are to be prepared by the respective Atomic Power Station authorities upto the period ending 16th September 1987. Revised proforma accounts of Rajasthan Atomic Power Station II for the years 1985-86 to 1987- 88 and Madras Atomic Power Station for the years 1986-87 and 1987-88 (all upto 16th September 1987) are still awaited (March 1991). The revised accounts of Tarapur Atomic Power Station for 1986-87 and 1987-88 (upto 16th September 1987) are under certification.

Department of Atomic Energy

Kakrapar Atomic Power Project

44. Extra expenditure due to delay in processing a tender

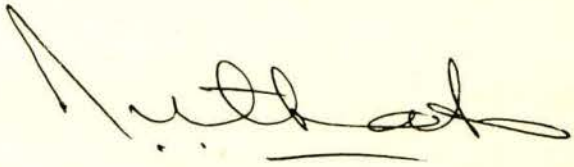
An indent was raised by Nuclear Power Board (the Board was dissolved and the Nuclear Power Corporation of India Limited formed in September 1987) in May 1986 for procurement of centrifugal fans, axial flow fans, air washer plant equipment etc. for Kakrapar Atomic Power Project units 1 and 2. Directorate of Purchase and Stores floated two part tenders in September 1986 with due date for opening for Part-I (technical) as 12th December 1986 and for Part-II (price and commercial) as 17th February 1987. Evaluation of the offers and the final recommendation by indenting officer were completed by 24th April 1987. The value quoted by the supplier for the items required by the Department was Rs.48.16 lakhs as per their quotation of December 1986 and the offer was valid upto 17th May 1987.

Stores Purchase Committee's approval was obtained for the puchase in its meeting held on 12th May 1987. Knowing that the tender was valid upto 17th May 1987, action ought to have been taken to place purchase order within the validity period. But, the order was placed in December 1987. The supplier increased the rate in the meantime and quoted Rs.49.98 lakhs.

The delay in processing the tender resulted in an extra expenditure of Rs.1.82 lakhs. The Department while admitting the facts in November 1990 contended that the extra price to be paid was due to the supplying

firm being considered for reduced quantity and not on account of delay in placement of order. But, the supplier had intimated while revising the price that if the revised price was accepted the clause regarding reduction in quantity would not be operated. The firm had stated that the revision was due to increase in the price of raw materials after the submission of original offer. Thus, the extra expenditure of Rs.1.82 lakhs was due to delay in processing the tender and cannot be attributed to reduction in the quantity ordered.

The Department also stated that since then detailed instructions had been issued to all levels of management to ensure that letters/telexes of intent are issued within the bid validity dates by prescribing time limits for various processing actions.



New Delhi
18 JUN 1991

(T.N. THAKUR)
Principal Director of Audit,
Scientific Departments

Countersigned

New Delhi

20 JUN 1991

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

Appendix-I

(Refers to paragraph 6.9)

State/Union Territory wise areas of wastelands and grants released during 1985-90 by National Wastelands Development Board

S.No.	State/Union Territory	Area (lakh hectares)	Grants released (1985-90) (lakhs of Rs.)	Grants released per hectare of wastelands(1985-90) (Rs.)
1.	Andhra Pradesh	114.16	579.99	5.06
2.	Arunachal Pradesh *		78.17	
3.	Assam	17.30	709.76	41.03
4.	Bihar	54.58	767.43	14.06
5.	Goa *		61.09	
6.	Gujarat	78.36	1255.54	16.02
7.	Haryana	24.78	1020.31	41.17
8.	Himachal Pradesh	19.58	1022.66	52.22
9.	Jammu & Kashmir	15.65	318.27	20.34
10.	Karnataka	91.65	1397.09	15.24
11.	Kerala	12.79	110.20	8.62
12.	Madhya Pradesh	201.42	1331.19	6.61
13.	Maharashtra	144.01	1095.38	7.61
14.	Manipur	14.38	459.89	31.98
15.	Meghalaya	19.18	494.11	25.76
16.	Mizoram *		1035.19	
17.	Nagaland	13.86	647.09	46.68
18.	Orissa	63.84	985.96	15.44
19.	Punjab	12.30	924.46	75.16
20.	Rajasthan	199.34	984.13	4.93
21.	Sikkim	2.81	263.29	93.69
22.	Tamil Nadu	44.01	690.75	15.69
23.	Tripura	9.73	336.01	34.53
24.	Uttar Pradesh	80.61	1528.24	18.95
25.	West Bengal	25.36	848.31	33.45
26.	Andaman and Nicobar Island	0.00		
27.	Chandigrah	**	0.00	
28.	Dadar and Nagar Haveli	36.04	0.00	
29.	Delhi		52.50	
30.	Daman and Diu		0.00	
31.	Lakshadweep		0.00	
32.	Pondicherry		0.00	
	Total	1295.74	18997.01	14.66

* Areas of wastelands stand included in the consolidated figure of wastelands in Union Territories.

** Total of wastelands areas in all Union Teritories including Arunachal Pradesh, Goa, Mizoram

Source : Table has been compiled from the statement of loans and grants furnished by the National Wastelands Development Board.

Appendix -II
Outstanding Utilisation Certificates
(Refers to paragraph 18)

Ministry/Department	Period to which grant relates	Number of utilisation certificates outstanding at the end of March 1989		Amount (in lakhs of rupees)
1	2	3		4
Electronics	1976-77	35		44.00
	1977-78	52		238.16
	1978-79	64		308.00
	1979-80	137		385.00
	1980-81	129		322.00
	1981-82	194		644.00
	1982-83	107		305.61
	1983-84	137		335.52
	1984-85	193		1740.18
	1985-86	118		1182.94
	1986-87	195		155.95
	1987-88	145		8130.92
	1988-89	347		6091.28
		1853	Total	21280.56
Environment and Forests	1980-81	31		36.95
	1981-82	91		53.99
	1982-83	133		299.34
	1983-84	269		499.83
	1984-85	287		668.91
	1985-86	331		1275.11
	1986-87	349		3410.01
	1987-88	732		2127.58
	1988-89	778		5694.43
		3001	Total	14066.15
Indian Meteorological Department	1986-87	1		0.19
	1987-88	1		0.10
		2	Total	0.29
Non-Conventional Energy Sources	1983-84	311		378.79
	1984-85	655		2016.70
	1985-86	721		4863.78
	1986-87	865		4391.44
	1987-88	1008		4363.35
	1988-89	1044		2188.18
		4604	Total	18202.24

Ocean	1981-82	4		190.00
Development	1982-83	3		0.26
	1983-84	32		255.00
	1984-85	38		35.00
	1985-86	51		65.00
	1986-87	84		255.00
	1987-88	57		536.19
	1988-89	110		488.00
		379	Total	1824.45
Space	1976-77	1		0.05
	1977-78	1		0.15
	1978-79	2		0.08
	1979-80	5		0.39
	1980-81	12		1.35
	1981-82	11		6.32
	1982-83	35		19.55
	1983-84	39		19.63
	1984-85	81		30.77
	1985-86	59		38.15
	1986-87	73		34.09
	1987-88	81		80.59
	1988-89	50		64.42
		450	Total	295.54
Science and	1976-77	8 22.00		
Technology	1977-78	61		66.00
	1978-79	166		267.00
	1979-80	228		373.00
	1980-81	383		414.00
	1981-82	479		645.00
	1982-83	723		761.00
	1983-84	790		581.00
	1984-85	894		1508.00
	1985-86	1055		2640.00
	1986-87	1869		3451.00
	1987-88	2527		4511.00
	1988-89	2400		7043.00
		11583	Total	22282.00